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STEEL

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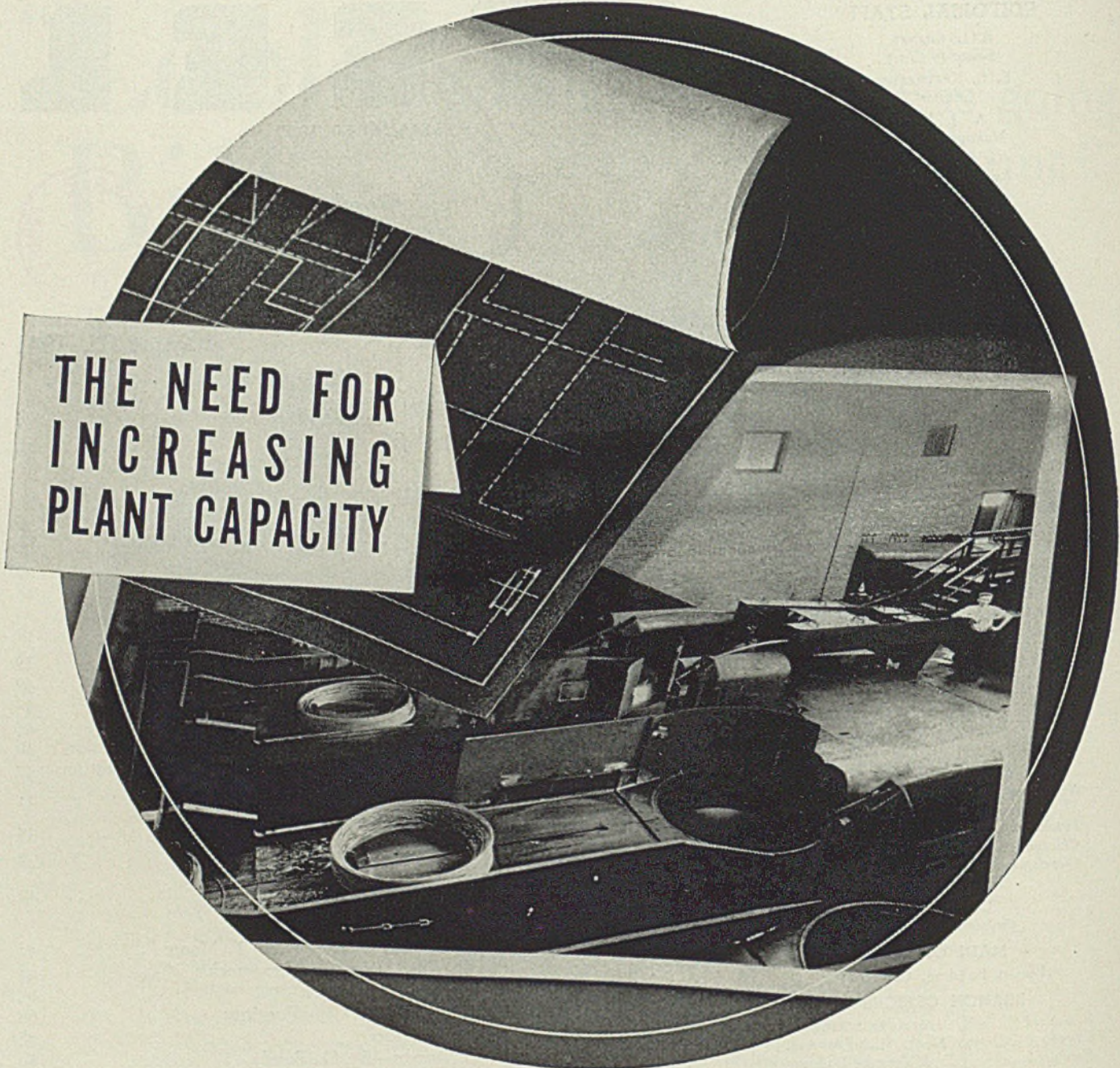
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PRODUCTION • PROCESSING • DISTRIBUTION • USE

August 25, 1941

17



GREATER Plant Capacity is Industry's No. 2 problem—
answered in blue prints. *It won't be long now!* But in
the meantime, present production facilities must be worked
to the utmost. . . . Owners of Morgan Mills are discovering
new capacities for greater tonnage with quality standards un-
impaired. We shall be glad to help *you* if we may.



MORGAN CONSTRUCTION COMPANY • WORCESTER, MASSACHUSETTS
R-91

HIGHLIGHTING THIS ISSUE OF STEEL

■ UNDER the impact of the all-out priority system recently applied to steel in all forms some consuming plants engaged on civilian goods (p. 93) already have closed down for lack of supplies. Shortages of other metals are contributory. Deprived of latitude, producers in many cases have advised consumers to expect no more material without priority ratings. Even though OPM is seeking to encourage defense subcontracting (p. 46) to avert a "priorities depression" the civilian problem shows signs of becoming critical. As a result of the stringent new pig iron regulations one Southern producer will be able to ship to only 10 per cent of its customers, and wonders what the other 90 per cent will do.

The situation for civilians with respect to certain products also will be affected adversely by reason of analyses of mill order books last week. Because comparatively few orders for wire, cold rolled sheets and strip, galvanized sheets, hot-rolled sheets and strip and tin plate—in the order named—come under priorities, considerable semifinished steel used for their manufacture will be diverted to products more heavily involved in priorities. Automobile production (p. 35) is to be cut 26.5 per cent during the four months starting Aug. 1—another straw showing how the wind blows. Further cuts are scheduled for later on. On the other hand, truck production will be increased.

Civilian Requirements

Whether the OPM carries out (p. 23) a new expansion program involving 12,000,000 tons of ingots annually also is a question having an important bearing on the steel supply for civilians; to build and operate these facilities more than 4,000,000 tons of steel would be necessary. In the meantime (p. 21) expansion now in progress will bring ingot capacity to 88,370,920 net

Steel Needed For Expansion

tons by the end of this year or early in 1942 . . . Many consumers will be interested in a story prepared for STEEL (p. 25) by a steel salesman who has specialized in priorities since first they began to be applied . . . The Defense Supplies Rating Plan has been revised (p. 42) and two new forms have been devised . . . Vanadium (p. 33) now is under full priority control.

Professor Macconochie details (p. 54) the heating, forging, heat treatment, rough and finish machining of 37-millimeter gun forgings, and larger sizes, as done at the Struthers Wells-Titusville Corp. plant at Titusville, Pa. . . . Variable speed drives (p. 65) increase production as much as 20 per cent. . . . John Knox, Steel Plant Editor, STEEL, describes (p. 70) a unique floating drive developed for mill runout tables. . . . Bombing of English towns has revealed that certain design factors will do much to prevent bomb blast from damaging buildings. These are explained (p. 80) by O. Bondy. . . . H. T. Moore shows (p. 52) how "bounce" rails provide a more effective highway protection.

How to get maximum output from aluminum anodizing equipment is confronting many aircraft manufacturers right now. By careful planning along the lines suggested (p. 84), one plant increased its output more than 25 per cent per working hour, jumped total from 5000 to more than 12,000 units per week. . . . Materials handling and fabrication are co-ordinated (p. 62) to produce a truck cab every 7 minutes. . . . Professor Macconochie includes data on quenching media (p. 68) for heat treating such items as alloy steel gun forgings. . . . Several ways to cut cost and weight of aircraft assemblies are described (p. 74). . . . Flame-tensioning band-saw blades (p. 78) proves successful.

Forging Guns At Titusville

To Speed Anodizing

The Problem of Steel Procurement

An Explanation of the Situation and Suggestions for Procedure

★ Today, the steel industry is producing at the rate of about 87 million tons a year. That is 29% more than in any previous year. However, 25 to 35% must be reserved for Defense, and this, plus growing commercial requirements, has brought about a temporary steel shortage.

Steel production is being increased, but because Defense needs are increasing, too, it is difficult to say when there will be ample steel for all requirements.

Anticipating this situation, Ryerson entered the emergency with very large and complete stocks in every one of its ten steel service plants. These stocks enabled many customers to get started quickly on important Defense projects. They were sufficient, also, to supply industries whose continued operation means jobs and incomes for millions not engaged in direct Defense.

The demand for Ryerson Certified Steels has been so great that our stocks have been substantially reduced and we are now out of many sizes. We are supplying urgent demands as fast as possible. It is particularly important at this time to take care of miscellaneous requirements from warehouse stocks because, if these rush orders had to be filled promptly by the steel mills, rolls would have to be changed, time would be lost, and production greatly reduced.

In giving best possible service to all of our customers, we will probably continue to run short of many types and sizes. Possibly, some type of allocation system may even become necessary. In the meantime, to meet the situation, we are making four suggestions:

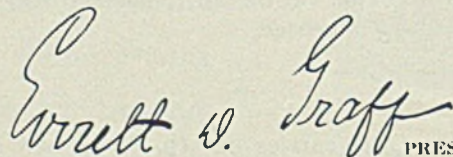
One: Write on every order the use for which the steel is intended in accordance with regulations imposed by general preference order M-21 made effective by the Office of Production Management on August 9, 1941. If for Defense purposes mention either the government contract or project number, or industry priority classification if any. This is necessary in order that we may classify your purchases in conformance with their group classifications.

Two: Send us your orders, not inquiries, so that valuable time will be saved and there will be no chance of steel, if on hand, being sold while the quotation is being made.

Three: List possible alternate sizes, gauges, and qualities that you could use if your exact requirements are not in stock.

Four: We urge your cooperation in conserving stocks and making them available to the largest number of users. Please try to avoid the tendency to order more than is required, for this is the surest way to create additional shortages that may prove serious to all.

For 99 years we have served industry through prosperity and depression—peace and war—and expect to continue to serve for many years to come. We appreciate the patience and understanding of our friends and customers in this national emergency and want you to know that we will continue to work with you on this problem of steel.


PRESIDENT

JOSEPH T. RYERSON & SON, INC.

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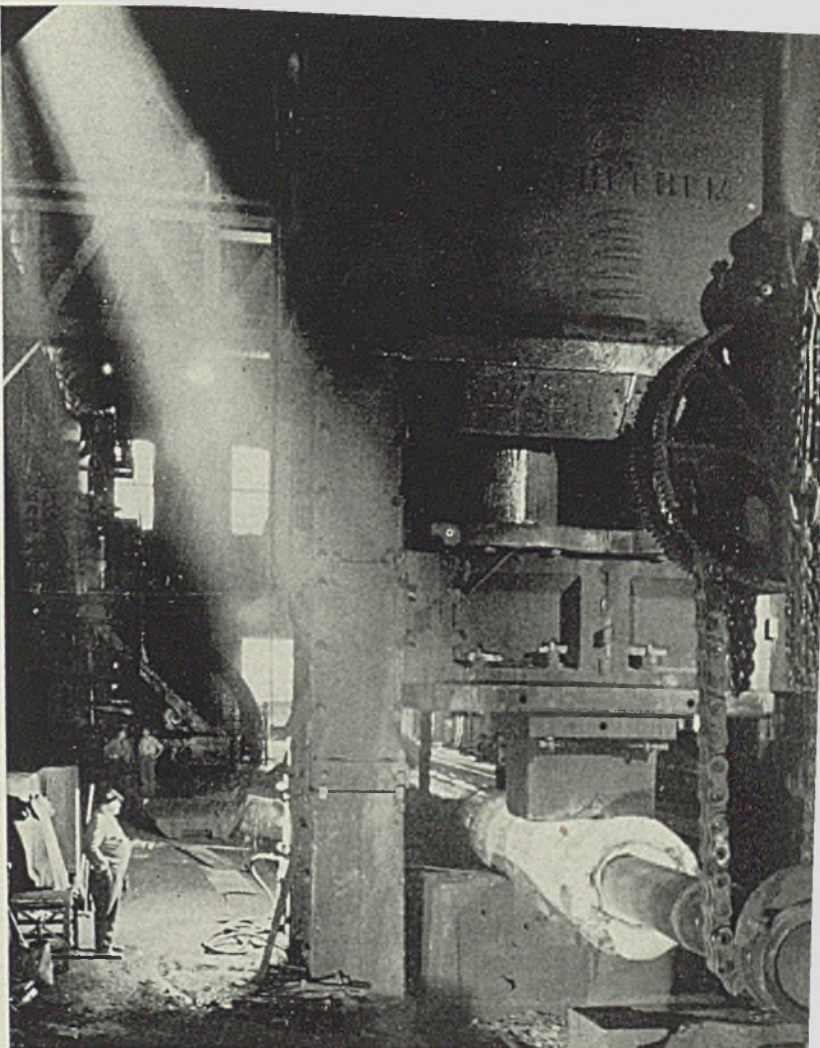
CINCINNATI
PHILADELPHIA

DETROIT
JERSEY CITY

+ + +

Half Billion for Steel Expansion This Year

+ + +



■ BETHLEHEM STEEL forging a gun tube in a 14,000-ton hydraulic press. This is one of the three largest forging presses in the United States

Expenditures for productive equipment expanded sharply over earlier plans . . . 4,222,220 tons of ingot capacity added or in process of construction

■ TOTAL steelmaking capacity of the country should be at an annual rate of 88,370,920 net tons of ingots by the end of 1941 or very shortly thereafter.

This figure is arrived at as the result of a survey just completed by STEEL, covering 24 major producers and 12 smaller companies, or all that are known to have any expansion programs.

This survey shows total expansion, under way at the beginning of the year and undertaken since, comes to 4,222,220 net tons of ingots, all to be ready for production before the end of this year or early in 1942.

Last week the American Iron and Steel Institute reported that as a result of a 2,000,000-ton expansion during the first half, ingot capacity as of June 30 was 86,148,700 tons. Adding to this figure the additional 2,222,220 tons to be completed dur-

ing the remainder of this year will bring the total to 88,370,920 net tons.

The increase referred to in the foregoing makes no provision for additional expansion proposals now being studied (p. 22) by OPM. The report at Washington is that proposals for new ingot capacity would provide some 12,000,000 additional tons. Whether this program, or a part of it, is to be authorized is not known. The only additional expansion of which the steel industry seems to be fairly sure is the addition of some 6,500,000 tons of pig iron capacity, some 1,500,000 tons of electric steel capacity and a certain amount of bessemer capacity.

Government authorization and financing and widespread application of priority ratings would be necessary for this additional program.

Cost of the 4,222,220-ton expansion program now in process originally

was estimated at \$457,500,000, considerably more than half of which, according to the companies involved, was to be financed out of their own funds. Now it is estimated that rising costs may move the figure higher. This is sharply in contrast with the American Iron and Steel Institute's estimate last January that the industry would spend \$282,000,000 for new productive equipment in 1941. Expansion in 1940 cost \$171,000,000. Estimated similar expenditures from the beginning of 1935 to the end of 1941 aggregate at least \$1,565,000,000.

Steel Capacity Increased 2,000,000 Tons in First Half

The steel industry increased its annual steelmaking capacity by a total of almost 2,000,000 tons during the first half of 1941, making

a total increase in the past 18 months of nearly 4,500,000 tons of new capacity, it is revealed by figures recently compiled by the American Iron and Steel Institute.

Installations of new equipment during the first six months of this year raise the industry's total annual capacity as of June 30, 1941, to 86,148,700 tons of steel ingots and castings. At the close of 1940, the nation's steel capacity was rated at 84,152,000 tons per year.

Capacity is ordinarily rated by the institute only as of the close of a year, but the substantial additions to capacity which went into operation during the first half of 1941 made advisable a survey of capacity as of mid-year.

Blast furnace capacity of the industry was increased by 300,000 tons during the first half of this year, and is now rated at 57,937,000 tons of pig iron and ferroalloys per year. Plans are now being considered to construct an additional 6,500,000 tons of blast furnace capacity.

Present steelmaking capacity of the industry is 18 per cent greater than the 72,985,000 tons of capacity available in 1929, and exceeds by fully 40 per cent the total of 61,021,000 tons of capacity available in 1918.

Of the total tonnage of new steel capacity which was placed in operation during the first half of this year, about 1,500,000 tons represented additional open-hearth furnace capacity and 686,000 tons represented the capacity of new electric furnaces. Bessemer steel capacity was reduced slightly as one converter, installed largely for experimental purposes, was dropped from the list.

Total capacity for producing steel by the open hearth process is now rated at 76,097,130 tons per year, a new peak.

Capacity of the industry's electric furnaces, used primarily to produce high quality alloy steels, is now 3,272,370 tons, likewise the highest on record. In the past year and a half, electric furnace capacity has risen nearly 75 per cent.

OPM Steel Expansion Report May Be Released Soon

WASHINGTON

Complete OPM report on the amount of steel expansion needed for the defense program is expected to be released soon. It now is in the hands of William L. Batt, of the OPM Production Division, who soon

will forward it to William S. Knudsen. Mr. Knudsen will analyze the report and turn it over to the President.

While OPM heads will not discuss the report, it is understood steel companies have indicated a willingness to increase present capacity by at least 12,000,000 tons. Part of this would be accomplished through improvements at existing plants.

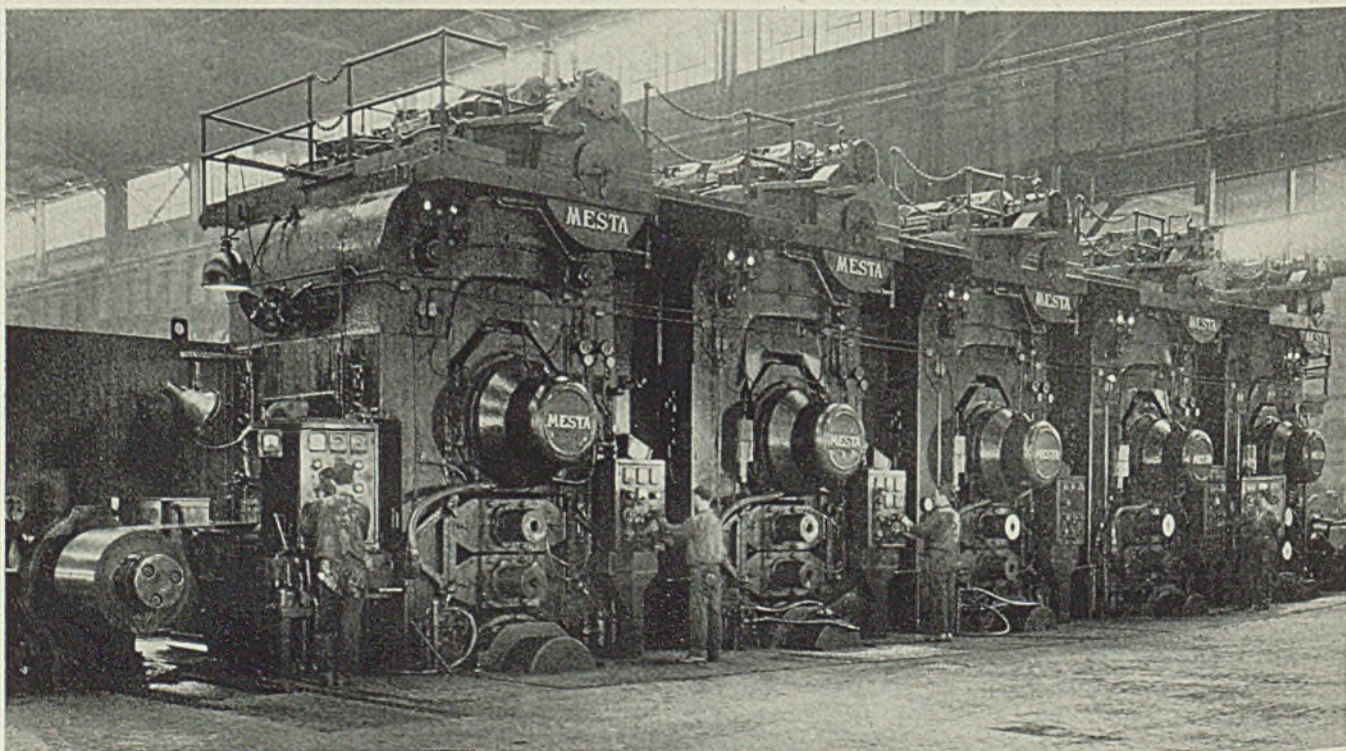
Pacific coast capacity will be increased by about 1,200,000 tons, it is reported. Western companies or subsidiaries proposed expansions totaling 1,556,000 tons to OPM several weeks ago.

At Pittsburgh, Jones & Laughlin Steel Corp. officials were "completely in the dark" concerning reports OPM was considering possibilities of erecting a new steel plant on property owned by the company at Hammond, Ind. The report, which originated in Washington, follows by only a few weeks similar reports originating at Hammond and which were without foundation.

Maritime Commission Considering Building of 25 Lake Ore Carriers

United States Maritime Commission still has under consideration the

New Cold Strip Mill Employs 11,400-Horsepower in Six Motors



■ Total of 11,400 horsepower is employed to drive the new 5-stand cold strip mill at the Irvin works of Carnegie-Illinois Steel Corp. First stand is powered by an 800-horsepower motor and the remaining four stands are driven by 2000, 2500, 2500 and 3000-

horsepower motors respectively. Tension reel is driven by a 600-horsepower motor. All are special mill type, designed by General Electric Co. with particular attention paid to their armature stored-energy characteristics.

Nominal strip speed is 3850 feet per

minute without exceeding rated capacity of motors. The mill has been operated as high as 3750 feet per minute. It will handle stock up to 38 inches in width and is the second 5-stand unit installed in the plant. First unit went into production in the fall of 1938.

Annual Blast Furnace Capacity

As of—	(Net Tons)		Charcoal Pig Iron	Total
	Pig Iron	Ferroalloys		
Dec. 31, 1940	56,522,370	980,660	106,560	57,609,590
June 30, 1941	56,838,310	992,300	106,560	57,937,170

Annual Steel Capacity

As of—	Open Hearth	Net Tons			Total
		Bessemer	Crucible	Electric	
Dec. 31, 1940	74,565,510	6,996,520	3,942	2,586,320	84,152,292
June 30, 1941	76,079,130	6,793,400	3,800	3,272,370	86,148,700

(Ingots Only)

Dec. 31, 1940	74,215,440	6,996,520	3,942	2,365,130	83,581,032
June 30, 1941	75,737,300	6,793,400	3,800	3,056,970	85,591,470

*Includes only that portion of the capacity of steel for castings of foundries operated by companies producing ingots. Figures issued by American Iron and Steel Institute last week.

question of authorizing 25 new lake ore carriers. It is not clear whether the commission can go ahead with this program without additional legislation.

There is also the possibility that if the commission finds it cannot finance the project the money may be obtained from the Defense Plant Corp., or some other emergency agency.

The commission has before it only one application, for two new vessels, with the understanding that if the building of these two is approved the same company will ask for four or five.

It is reported here that some of the lake carriers are questioning the need for 25 new vessels as suggested. They think, it is said, 20 new carriers will fill all possible needs.

The program for 25 carriers was approved by OPM. Maritime commission officials say they do not know when they will reach a final decision.

Five large new ore freighters are under construction or on order for the Pittsburgh Steamship Co., United States Steel Corp. subsidiary. Two are expected to be ready by the middle of the 1942 season and the other three probably not until near the end of the 1942 season.

Fleet at 100 Per Cent

The new Pittsburgh Steamship vessels will be 640 feet long and will have a maximum single cargo capacity of about 17,500 gross tons. On the basis of 30 trips a season, they would add approximately 2,625,000 tons to the fleet's annual carrying capacity.

The present fleet of 292 vessels has been operating at 100 per cent of capacity since the middle of May; last year on Aug. 15 there were 295 of the fleet's 297 vessels in commission.

At week's end, 15 Canadian vessels had entered the American ore trade. They are estimated to have loaded

approximately a quarter of a million tons since they were transferred.

July ore consumption set an all-time record at 6,497,442 tons. (See page 108).

Meeting Called To Study Scrap Shortage

■ OPACS and OPM officials have announced a meeting will be held in Washington Aug. 27, which about 150 iron and steel scrap brokers and representatives of steel mills and foundries have been asked to attend.

Ways and means for increasing the supply of scrap and maintaining a continuous flow to the industry will be discussed.

September Zinc Pool To Take 27% of July Output

■ A supplementary order issued last week by E. R. Stettinius Jr., director of priorities, announces the quantities of zinc and zinc oxide to be set aside for the zinc pool effective Sept. 1. Under the order for September and for each month thereafter until otherwise ordered, amounts of metallic zinc, zinc oxide and zinc dust to be set aside by producers were fixed as follows:

Metallic zinc, an amount equal to 27 per cent of producers' July, 1941, production; zinc oxide, 10 per cent of producers' July production; zinc dust, none.

Maintenance, Repair Order Is Withdrawn

■ The maintenance and repair rating plan of OPM's Priorities Division has been withdrawn and soon will be replaced with a revised version. Necessity for simplifying procedure made the move necessary. Form PD-67 will be supplanted by a new form.

LABOR

Draft Reclassification Ends Strike at Chain & Cable Plant

■ A LOCAL Pittsburgh draft board last week proved a compelling force toward insuring labor peace. Striking employes of American Chain & Cable Co.'s Page Division voted to return to work late in the week after four days of idleness despite the fact their grievance had not been settled, and no negotiations were being held.

The local draft board had begun to reclassify workers and ten strikers, deferred because of their jobs in defense work, received notices to report immediately for physical examination. A sudden election was called and all went back to work. The ten will not return, however, unless the company requests a second deferment for them.

Walkout Halts Production at Alan Wood Iron Ore Mine

Scrub Oak Mine of Alan Wood Steel Co., Conshohocken, Pa., at Mine Hill, N. J., was shut down last week when 500 workers went on strike after one of their number had received a dismissal notice upon his return from vacation. Only a maintenance crew reported for work to keep mine pumps in operation and prevent flooding.

Committee of union and nonunion workers was appointed to confer with the mine superintendent concerning the dismissal.

Producing 3000 tons of iron ore daily, the mine has been working 24 hours a day the past 15 months.

Carnegie-Illinois Completes Wage Agreement With Coke Workers

Agreement between Carnegie-Illinois Steel Corp., Pittsburgh, and Steel Workers' Organizing Committee representatives on behalf of coke workers at the company's Clairton, Pa., by-product coke plant, was signed last week.

Negotiations had followed a one-day strike July 25, and the agreement is retroactive to that date. It provides wage increases for workers involved.

100 Tool Engineers Finish Training Course at Baltimore

First 100 tool engineers to complete the emergency defense training program instituted in Baltimore under direct sponsorship of the University of Maryland were graduated recently. Under the current set-up, classes in tool engi-

neering are conducted throughout Maryland, at College Park, Baltimore, Hagerstown and also at Washington.

Many of the trainees completing the course were formerly skilled workers in industrial plants whose work had indicated an ability to undertake tool engineering provided suitable training were completed.

Baltimore chapter of the American Society of Tool Engineers is assisting in carrying out the training plan.

Connecticut's Training System "Leading Nation"

■ Connecticut's plan for emergency training of defense workers is "apparently leading the nation in combined effectiveness and quantity of worker training," according to Otto W. Winter, national chairman, Emergency Defense Training Committee, American Society of Tool Engineers.

Under this state-developed and state-financed plan, 29 schools are co-operating in training 3000 every five weeks for specific defense jobs. Effectiveness of the program, developed in co-operation with industry, is indicated by the fact 45 per cent of all machine operators at United Aircraft Corp. plants in Connecticut are graduates of the 200-hour school set-up.

The Connecticut plan (STEEL, Aug. 19, 1940, p. 21) is similar to the training program recommended last year by the American Society of Tool Engineers.

Pittsburgh River Oil Shipments at New Peak

■ River shipments of petroleum and petroleum products in the Pittsburgh district in July reached an all-time high, primarily because of the threatened shortage in the East. Ohio river, normally the largest carrier of petroleum products, floated 99,000 net tons or 29,700,000 gallons in the month. This was an increase of 19,200 tons over shipments in the preceding month and 15,000 tons more than in July, 1940.

Steel shipments on the Ohio in July, 228,600 net tons, were down slightly from 236,500 tons in June. Decrease was due to declining shipments of scrap from the Southwest. Total shipments on the Ohio, 1,781,000 net tons, was slightly less than the all-time peak of 1,785,300 tons in June.

On the Monongahela, aggregate of shipments was 2,862,000 tons, up 30,000 tons because of a 35,000-ton increase in steel shipments, from 145,700 tons to more than 180,000

Iron, Steel Section of OPM, as Now Constituted

New Social Security Building, Washington; Phone Republic 7500

A. D. Whiteside, Chief of Section

Charles Halcomb, Assistant and Priority Specialist

Ray G. Faus, Administrative Assistant

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Metallurgy, plant expansion:
George B. Waterhouse

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R. L. Greenamyer

Wire and Wire Products

L. C. Crewe Jr.

Steel Castings

G. F. Hocker
R. Doughton

Cold-finished Bars

W. Vosmer

tons in July. Allegheny river totals increased in July to 330,000 tons from 320,400 in June.

Steel Representatives Urge River Extension

■ Dredging of the Cuyahoga river at Cleveland to permit navigation 1500 feet beyond present limits was recommended to United States Engineers last week by representatives of Republic Steel Corp. and Otis Steel Co., both of which have plants near the site of the proposed extension.

The steel company spokesmen said the additional deep water was necessary to permit expansion for defense needs.

Donald B. Gillies, Republic vice president, stated his company was

investigating, at the government's request, plans for constructing additional blast furnace and steelmaking capacity on a site within the channel extension requested.

Walter M. Lorenz, Otis traffic manager, asserted the project would provide his company with dock and storage space.

■ United States Steel Corp. common stock outstanding June 30 totaled 8,703,252 shares. Preferred holdings at the end of the second quarter aggregated 3,602,811 shares. Foreign holdings of United States Steel common, June 30, were 490,298 shares, or 5.6 per cent of the issue, against 486,559 shares March 31. Of the preferred stock, 59,558 shares, or 1.6 per cent, were owned abroad, compared with 59,588 shares of foreign holdings March 31.

Steelman Summarizes Priority System

As It Affects His Industry

■ WHILE the priorities system, created to meet an emergency and often revised and extended, appears unnecessarily tied up with red tape, a careful reading of the documents involved will save much time and avert much confusion. Usually the general orders or preference certificates are self explanatory and important features readily apparent. They have been drafted to cover all possible contingencies.

Herewith is presented an outline of priority matters relating to steel.

The steel consumer secures a preference by one of three methods:

1. A government agency places a contract directly with the consumer in question and at the same time assigns a preference rating.

Example—A shell steel contract which specifies a rating A-1-H.

2. The steel consumer receives an order for a subcontract and his customer sends him a preference rating certificate to cover the order involved.

Example—An order for one large concrete mixer covered on PD-3 form from prime contractor.

3. The steel consumer manufactures a critical item such as machine tools and has been given a blanket preference order which may be used to secure necessary steel.

Example—P-5A Serial No. 3 which may be extended to any supplier by executing an acceptance.

Most questions which arise will be answered by a review of the important forms and general orders as outlined below, and by a thorough reading of any document on which you are working.

On any preference rating certificate there are four important points to note:

1. The preference rating assigned.
2. The government contract number or job.
3. The quantity specified which may not always agree with an order.
4. The specified shipping date required for the quantity shown.

EDITOR'S NOTE: The accompanying article was written for STEEL by a student of the priority regulations issued from Washington. He is associated with a large steel producing company, in a position where he must have a knowledge of priorities and their operations. For obvious reasons, however, his name cannot be used.

Preference ratings for defense work range from:

AA—Emergency, seldom used
A-1-A to A-1-J—Used for most Army and Navy contracts.

A-2 to A-9—Usually used for fundamental supplies such as mining equipment, freight cars, etc.

A-10—Lowest defense rating used if no higher rating is assigned.

B-1 to B-8—For civilian requirements; officially this classification has been used only on nickel-bearing steel. It is expected that the new groupings, group A to group H as set up on PD-73 may, under order M-21, help to classify civilian requirements although these alphabetical groupings are not to be construed as preference ratings.

Important Forms

Note any preference rating AA to A-10 may be extended on any of the following certificate forms, but the usual rating is noted in brackets at the end of each paragraph.

PD-1—Application for preference rating to be used by steel consumer to secure a rating for a particular order or group of orders. Must be sent to Priorities Division of OPM, New Social Security building, Washington.

PD-2—A specific preference rating certificate covering a particular order or item or group of orders. Issued only by the Priorities Division of OPM. Not extendable. To extend, subcontractor must apply to Priorities Division on PD-1 for a new certificate. PD-2 technically ap-

plicable only to the supplier to whom it is addressed. (A-1-C to A-10) Usually carries a serial number with prefix "C".

PD-3—A specific preference rating certificate to be used on any United States Army or Navy supply arm or bureau contract. This type of certificate may be issued or countersigned by any Army or Navy officer or inspector. It may be re-extended by any subcontractor or sub-subcontractor ad infinitum. Extensions are controlled since the Army or Navy contract involved must be specified on the certificate.

Any steel consumer who receives such a certificate can get a supply of PD-3 forms from the nearest Army or Navy office and by reading the instructions contained therein should have little difficulty in extending the rating to his steel supplier. (A-1-A to A-1-J) Usually carries a serial number with prefix "AN".

PD-4—Identical to PD-3 except that it is to be used for contracts of all government agencies other than the Army or Navy. Thus, on a TVA contract the original certificate or any extension should be countersigned by a TVA or authorized government official. (A-1-C to A-10) Usually carries a serial number with prefix "VG".

PD-5—This certificate is almost identical to PD-3 and 4 except that it is to be used only for orders required for a foreign government contract and must be countersigned by the agent of the foreign government involved as well as by an authorized United States government official. (A-1-B to A-1-J) Usually carries a serial number and prefix "F".

PD-10—"Request for nickel-bearing steel". This form is issued by the consumer and must be notarized. It has been effective as a priority rating certificate. Directions on the form are clear and concise and application has probably been simplest of all forms so far.

Since nickel is under a mandatory

priority this form must be submitted with each nickel steel order. (A-1-A to B-8)

PD-11—Report of inventory of nickel-bearing steel, to be filed by steel consumer.

PD-19A—Report for inventory control under General Metals Order No. 1. Now obsolete and replaced in effect by PD-73.

PD-25—Report of requirements for scarce materials. In effect a form to be used in applying for a blanket preference rating order P-6 Defense Supplies Rating Plan. Explained more fully below.

PD-25B—Report form to OPM of items extended under a General Preference Order P-6.

PD-32—Customer's statement of failure to obtain required delivery or place an order for iron and steel products. Self-explanatory.

PD-73—Customer's statement to producer classifying purchase order or contract for steel.

Effective Scpt. 1, 1941, each consumer must fill out one copy of this form and forward it with each order entered.

By Oct. 15, 1941, each consumer must have filled out and mailed one copy of this form to his supplier for each order open on his books.

Included in the form is a space for required shipping date, exact purpose, and classification of use in order of importance.

Blanket Preference Rating Orders

P-5—Obsolete blanket rating for cranes; not extendable. Rating assigned A-1-A.

P-5A—Material entering into manufacture of cranes. Rating, A-1-A.

P-6—Defense supplies rating plan. Rating, A-10 or higher.

P-7—Material entering into merchant ship construction. Rating, A-1-A to A-1-C.

P-8—Material entering into freight car construction. Rating, A-3.

P-9—Various suffixes for heavy bombers. Rating, A-1-A and lower.

P-11—Material for production of metalworking equipment. Rating, A-1-A or lower as assigned.

P-13—Material for air frames. Rating, A-1-A and lower.

P-14 A & B—For ship ways. Rating as assigned.

P-17—Canning machinery and equipment. Rating, A-2.

P-19A—Material entering into the construction of a defense project. Rating, as assigned.

All of these blanket preference orders operate in much the same way. The manufacturer goes to the Priorities Division of OPM and if they give him a general preference order he should read it carefully. If he decides to accept the conditions stated therein, he executes by signing an acceptance and mailing to the Priorities Division. A serial num-

ber for identification purposes is assigned to each manufacturer. The manufacturer should extend to his supplier by forwarding a photostat or copy of his signed acceptance of a serially numbered copy and should also forward four or more additional copies, unsigned, so that his subcontractors may sign acceptances, mail a copy to OPM Priorities Division, and re-extend to their suppliers. The first page of the certificate showing the serial number and the original producer or contractor to whom extended will always remain the same for ready identification.

These general orders carry expiration dates, usually after 60 or 90 days or after a particular project such as a number of identified ships or a new ordnance plant has been completed.

There are some variations in handling the various orders, but a careful reading of any order will answer any question thereto.

Once a consumer has sent an executed copy of an order to a supplier no additional forms are necessary. The consumer must give the supplier a list of items and orders (*with shipping dates necessary to meet a carefully planned production schedule*) which are to carry the rating.

It is suggested that the supplier show on his shipping notices and invoices the preference order number, producer's serial number, and preference rating extended. All of

these blanket orders require on demand of the producer or any subcontractor or supplier who extends the rating or to whom a rating has been extended, a report of orders and/or tonnage extended. This is necessary in order to prevent abuse of the privilege conferred. It is possible that the Priorities Division will make spot checks to determine the accuracy of such records and reports.

If a steel consumer is producing large lots of small items for defense supplies where individual tonnages are too small to use extensions of specific blanket preference certificates, his best move would be to secure a P-6 order after reporting his requirements on a PD-25 form. It may be that the PD-73 forms under general order M-21 will relieve the situation for consumers of this type, but every effort should be made to get a rating of A-9 or better under the P-6 order.

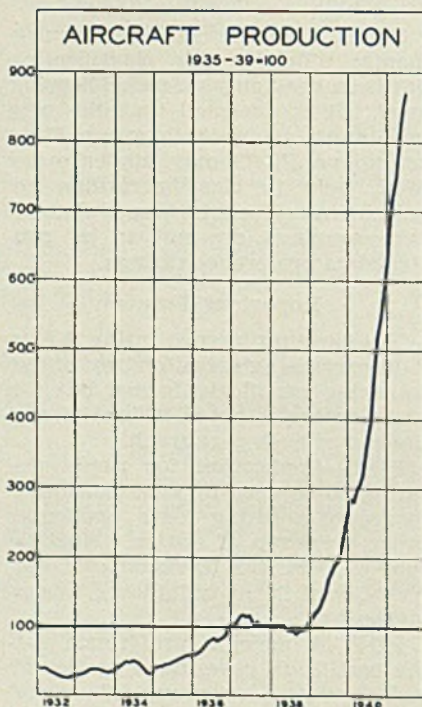
On most of the blanket orders listed above the Priorities Division may extend any preference rating from A-1-A to A-10. For example, under the P-7 maritime ships order, 1941 hulls carry an A-1-A rating, 1942 hulls carry A-1-B and 1943 hulls carry A-1-C.

Summary of General Orders

General Metals Order No. 1—Inventory control plan, now replaced by order M-21.

General Steel Preference Delivery

Aircraft Production Index Significant



■ "The index in the diagram showing the monthly changes in the output of aircraft may well be

the most important of all our indicators of industrial production," says the Cleveland Trust Co., in its current *Business Bulletin*.

"It is directly significant as reflecting progress in one most important factor in our own preparedness program, and it is of perhaps equal consequence as a measure of our ability to supply aid to Britain and her allies."

The diagram is based on the series of aircraft production data included as one of the components of the Federal Reserve index of industrial production. The heavy irregular line shows the monthly changes in output of aircraft in this country. Average for the five years from 1935 through 1939 is taken as being equal to 100.

Surprisingly, the steeply rising trend started early in 1939, long before the outbreak of war.

The actual number of military airplanes completed during the first six months of 1941 was 7423, eclipsing by more than 1000 the entire war plane output of 1940. Since the start of the defense program, a little over a year ago, more than 12,000 airplanes have been produced.

Order No. 1 of May 29, 1941, now replaced in effect by order M-21.

General Preference Order M-5 and M-5-A of April 10, 1941, set up mandatory priorities for nickel-bearing steel.

M-17—Pig Iron Order issued Aug. 1, 1941.

M-21—General Preference Order to conserve the supply and direct the distribution of steel.

Specific changes from General Steel Preference Delivery Order No. 1 of May 29, 1941, revoked by this order are:

1. All defense orders not assigned a higher rating automatically take a preference rating A-10.

2. Provides that each order must be covered by form PD-73 which it is assumed will give steel producers detailed information on each order so that they may schedule accordingly.

J & L May Air Condition More Blast Furnaces

Increased pig iron yield from Jones & Laughlin Steel Corp.'s air conditioned blast furnaces, one at Aliquippa and two at its Eliza works, is prompting the company to consider similarly equipping its other eight stacks. Iron production at the Aliquippa stack is reported to have increased 8 per cent.

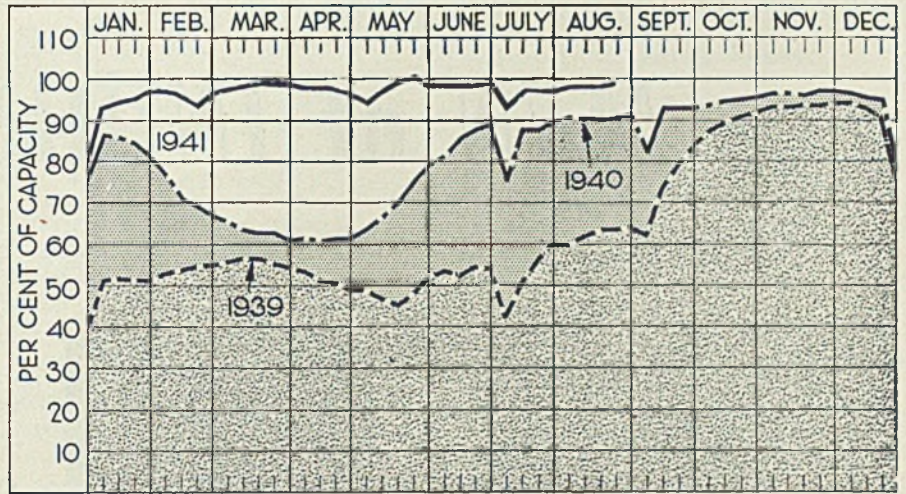
Installation of air conditioning at all 11 stacks, the company figures, would result in pig iron yield increase approximately equivalent to the output of a new furnace. Cost of the additional equipment would be considerably less than the cost of a new stack and less time would be required to install the equipment than would be needed to build a new furnace.

Shells To Be Made at McKeesport Plant

Jones & Laughlin Steel Corp. is equipping its McKeesport plant to produce shells, under an agreement with the Defense Plant Corp. The plant will employ 1500. The rehabilitation program will be financed in part by the government and in part by the company.

Company also is installing new soaking pit facilities and extending the open hearth building at its Pittsburgh plant. No additional furnaces are contemplated but the output of present units will be increased by the new facilities.

Reserve supply of crude iron ore in New Jersey is estimated at more than 35,000,000 tons, according to Meredith E. Johnson, state geologist. This equals the total tonnage of iron ore taken from New Jersey mines in the past.



PRODUCTION Up

STEELWORKS operations last week advanced ½-point to 98½ per cent. Four districts made gains, two declined and six were unchanged. A year ago the rate was 90½ per cent; two years ago it was 63½ per cent.

St. Louis—Unchanged at 98 per cent, which has been held for four months.

Detroit—Declined 2 points to 92 per cent, with two open hearths idle.

Cleveland—Completion of repairs on open hearths raised the rate 3½ points to 93 per cent.

Cincinnati—Rose 2½ points to 88 per cent but a curtailment for open hearth repair is expected this week.

Chicago—Increased 1½ points to 101½ per cent, 1 point below the record level of 102½ attained in three weeks in May and June.

Birmingham, Ala.—Maintained 90 per cent, with 22 open hearths in production. Tennessee Coal, Iron & Railroad Co. has relighted its No. 2 stack at Ensley, Ala., on completion of repairs.

Central eastern seaboard—Steady at 95½ per cent, expected curtailment from scrap shortage not yet apparent.

New England—After briefly touch-

ing 100 per cent last week operations receded to 90 per cent, one furnace going down for repairs.

Buffalo—Lighting of an open hearth by Republic Steel Corp. raised the rate 2½ points to 93 per cent.

Pittsburgh—Held at 100 per cent for the fifth week. Active blast furnaces number 44 out of 50. Carnegie-Illinois Steel Corp. blew in its No. 4 Duquesne stack, making all six active at that plant. This company now has 22 of 25 stacks active in the district.

Wheeling—Slight adjustment in producing units resulted in a decline of 1 point to 92 per cent.

Youngstown, O.—For the seventh consecutive week steel production remained at 98 per cent, with 76 open hearths and three bessemer active.

Oil Drum Makers To Be Granted A-5 Rating

Arrangements have been completed with OPM to assure manufacturers of steel drums sufficient steel with which to fill defense orders for petroleum and oil companies.

A committee representing the manufacturers and steel producers has been conferring with OPM officials. The announcement last week added that the industry has been advised that orders up to two-thirds of the normal rate for steel would be eligible for A-5 priority rating to meet requirements for chemical and petroleum products during September and October.

The A-5 rating on a two-thirds basis covering these two months is a temporary arrangement.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended Aug. 23	Change	Same week	
			1940	1939
Pittsburgh	100	None	83	56
Chicago	101.5	+ 1.5	98	56
Eastern Pa.	95.5	None	89	44
Youngstown	98	None	83	55
Wheeling	92	- 1	99	86
Cleveland	93	+ 3.5	86.5	80
Buffalo	93	+ 2.5	90.5	60.5
Birmingham	90	None	88	75
New England	90	None	85	70
Cincinnati	88	+ 2.5	78	63
St. Louis	98	None	77.5	57
Detroit	92	- 2	92	82
Average	98.5	+ 0.5	90.5	63.5

MEN of INDUSTRY

■ **FREDERICK E. MUNSCHAUER**, vice president and treasurer, Niagara Machine & Tool Works, Buffalo, has been elected president. He has been associated with the company 33 years. **George R. Kinney**, sales manager, who has served with the company 22 years, becomes vice president.

Richard P. Swartz, vice president, Crown Can Co., division of Crown Cork & Seal Co., Baltimore, has been promoted to assistant to president.

John L. Foley, 313 Herman street, Buffalo, has been appointed distributor in the Buffalo territory by Hobart Brothers Co., Troy, O., for its line of arc welders and supplies.

John H. Collier, president, Crane Co., Chicago, has been elected to the board of trustees of Illinois Institute of Technology, Chicago, to fill the vacancy created by death of C. B. Nolte, late president of the company.

H. G. Smith has been promoted to executive engineer in charge of engineering of automotive and industrial division and radial diesel division, Buda Co., Harvey, Ill. He was formerly chief engineer of the automotive division.

S. A. Harris has been appointed eastern regional manager, Detroit Rex Products Co., effective Sept. 1. He succeeds **W. F. Newbery**, who has been promoted to the general office at Detroit on special duties.

Adam L. Wesner has joined the technical staff of Battelle Memorial Institute, Columbus, O., and has been assigned to the division of materials beneficiation where investigations of coal laundering and ore dressing methods are in progress.

W. H. Spowers Jr., for many years a consulting engineer specializing in galvanizing, has been appointed Lieutenant Commander in the United States Navy and ordered to active duty in the Bureau of Ships, Washington. He will continue to maintain his offices at 551 Fifth avenue, New York, for limited consulting work. Mr. Spowers has built many of the largest galvanizing plants in this country, Canada,



F. E. Munschauer



George R. Kinney



W. H. Spowers Jr.

South America and Europe. He is also president of Spowers Research

Laboratories. In addition to writing numerous articles on various phases of galvanizing, he is author of the book, "Hot Dip Galvanizing Practice." A member of the Wire Association, he is associate editor of *Wire and Wire Products*. Mr. Spowers also has two sons in military service.

James T. Fox has been made blast furnace superintendent, Blast Furnace Division, Koppers United Co., Granite City, Ill. He has been assistant blast furnace superintendent, Interlake Iron Corp., Scuth Chicago, Ill., the past four years, and before that was associated with Inland Steel Co.

Dr. John Campbell, since 1929 technical director, International Paper Co., has resigned to become associated with Reynolds Metals Co., Richmond, Va., where he will be in charge of a plant efficiency department devoted to manufacturing methods.

W. W. Hancock, secretary-treasurer, and **P. F. Boyer**, comptroller, Republic Steel Corp., Cleveland, were elected directors at a meeting of the board of directors last week. Both also were elected vice presidents, in addition to their present offices.

C. A. Nenno, executive vice president, J. M. & L. A. Osborn Co., Cleveland, and manager of its Buffalo division, has resigned due to ill health. **C. E. Caddy**, the past several years manager of the company's Detroit division, succeeds Mr. Nenno as manager at Buffalo. **Carl T. Howe** has been appointed manager of the Cincinnati division, and **C. F. Gruenert**, formerly assistant manager at Detroit, has become manager there, succeeding Mr. Caddy.

William B. Given Jr. has been elected president, National Bearing Metals Corp., New York, to succeed **J. B. Strauch**. Mr. Strauch has been elected chairman of the board, which position was previously held by Mr. Given. Mr. Given is also president, American Brake Shoe & Foundry Co., which company owns a controlling interest in the National Bearing Metals Corp.

DIED:

■ **Theodore E. Barker**, a founder-member of the American Society for Metals, at his home in Atascadero, Calif., Aug. 16. Mr. Barker helped organize a chapter of the Steel Treating Research Society in 1917, which a year later took the name of American Steel Treating Society, and served as president of the latter two years.

After amalgamation of the Steel Treating Research Society of Detroit with the American Steel Treating Society as the American Society for Steel Treating (changed in 1934 to the American Society for Metals) Mr. Barker served one year as first vice president. He was a director of the society in 1927-28 and chairman of the Chicago chapter in 1926-27.

Mr. Barker had been affiliated, successively, with the Miehle Printing Press & Mfg. Co., Chicago; Accurate Steel Treating Co., Chicago; and Atascadero Motor Lodges, of which he was proprietor.

◆
L. S. Kerchner, 61, Aug. 15, at his home in Pittsburgh. He was associated with the American Manganes Mfg. Co., now Dunbar Corp., many years, prior to establishing his own sales agency for pig iron, coke and sand in 1920. In 1922, with R. M. Marshall, he formed the partnership known as Kerchner & Marshall, and six years later the company was incorporated as Kerchner, Marshall & Co., with offices in the Oliver building, Pittsburgh, and branches in Cleveland and Detroit.

◆
Thomas Waddell Gangloff, 49, technical manager, Hazard Insulated Wire Works Division, Okonite Co., in Wilkes-Barre, Pa., Aug. 10.

◆
George L. Markland Jr., 73, chairman, Philadelphia Gear Works, Philadelphia, Aug. 14, in that city. He was a former president, American Gear Manufacturers Association, and a former director, National Association of Manufacturers and National Metal Trades Association.

◆
D. Chester Scull Jr., 37, former manager, stamping department, Coatesville Plate Washer Co., in Philadelphia, recently.

◆
Durwood B. Walters, 48, vice president and general manager, Chicago Vitreous Enamel Products Co., Chicago, in Evanston, Ill., Aug. 18.

◆
Roger D. Howell, 64, assistant general superintendent, Bliss & Laughlin Inc., Harvey, Ill., died of a heart attack Aug. 16. He had been associated with the company about 20 years and was a brother

of **Walter R. Howell**, president of the company.

◆
A. C. Danner, 77, for more than 20 years an overseas representative of International Harvester Co., Chicago, Aug. 18 in West Palm Beach, Fla. He retired in 1922.

◆
George S. Salzman, 63, vice president in charge of production, Cleveland Graphite Bronze Co., Cleveland, Aug. 16. He had been associated with the company 11 years.

◆
Arthur B. Purvis, 50, director general of the British Purchasing Commission in the United States, recently in an aircraft accident in the United Kingdom.

◆
Louis H. Mesker, 65, Cleveland representative for Reed-Prentice Corp., Worcester, Mass., in Cleveland, Aug. 1. He formerly was associated with the Cleveland Planer Co. and Kearney & Trecker Corp.

◆
P. R. Forman, 65, president, National Pneumatic Co., Rahway, N. J., Aug. 13. He had been associated with the company 40 years.

◆
Merlin Kramer, 42, research engineer and an assistant superintendent, West Pullman works, International Harvester Co., Chicago, Aug. 20, in that city.

Foundry Equipment Sales Index Higher in July

■ Foundry Equipment Manufacturers' Association, Cleveland, reports index of net orders closed for new equipment in July was 368.4, compared with 273.3 in June and 291.2 in May. Index for repairs was 326.9, compared with 304.7 in June and 321.0 in May. Total sales index was 358.1 in July, 281.1 in June and 298.7 in May.

Indexes are percentages of monthly averages of sales to metalworking industries, 1937-39. Practical comparison of figures on the old base can be determined by multiplying by 1.328.

Founders' Society to Open Washington Office

■ Gray Iron Founders' Society will open a branch office in Washington to insure co-operation of members of the society with the national defense administration, to expedite transmission to members of the orders and rulings of the administration and to assist members in their work with the government.

W. W. Rose, executive vice president of the society, will be in active charge of the office. The main office in Cleveland will operate as usual under the supervision of John Vickers.

Pool Purchasing To Speed Defense Work

■ Large-scale co-operative purchasing for defense production has been undertaken by White Motor Co., Cleveland; Diamond T Motor Car Co., Chicago; and Autocar Co., Ardmore, Pa., it was reported last week by the Purchasing Agents Association of Cleveland.

The three companies are working together on an order for 9347 motorized units, including half-trac scout cars, personnel carriers and mortar carriers. White is reported building 4908 scout cars and mortar carriers, Autocar has 2439 scout cars and personnel carriers and Diamond T is manufacturing 2000 personnel carriers. White motors are used in all the units.

Normally direct competitors, the companies have pooled their resources in the interests of defense. Joint purchasing commission comprising one representative from each company has been formed. Commission is composed of John E. Dunbar for White, J. E. Bower for Autocar and H. C. Emberson for Diamond T.

Small Firms Pool Facilities To Secure Defense Work

Endeavoring to obtain defense contracts, several smaller firms in Ellwood City, Pa., are pooling their facilities, according to the Ellwood Chamber of Commerce. Companies reported co-operating in the project are: United Tube Corp., Cavert Wire Co., Ellwood Co., Beaver Enamelling Co., Ellwood City Iron & Wire Co., Jones Engineering Co. and Ellwood Products Corp.

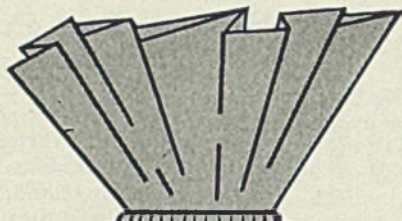
Several of the city's larger manufacturers are already working on defense contracts, it was reported. These include National Tube Co., Aetna-Standard Engineering Co. and Mathews Conveyer Co. Should the pool plan succeed, it was said, part of the facilities of these plants will also be included.

July Industrial Truck Bookings Slightly Lower

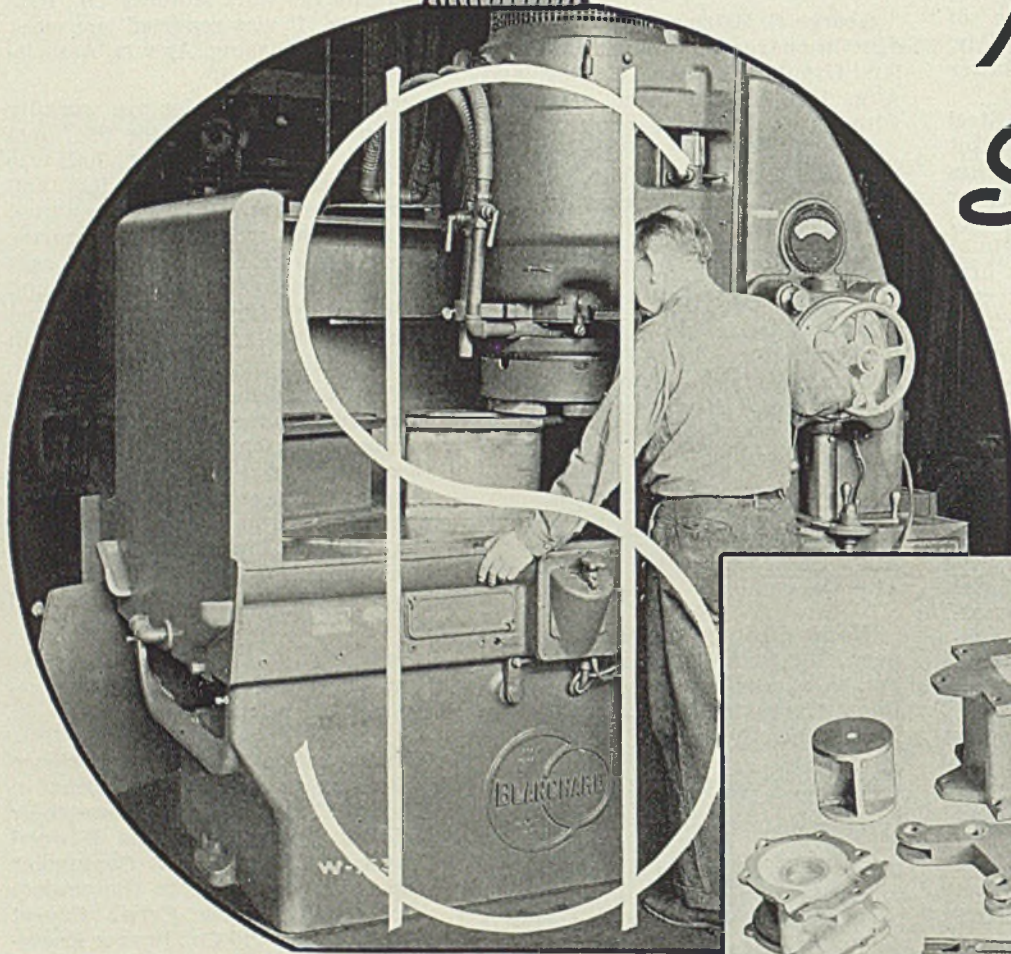
■ July electric industrial truck bookings totaled 273 units, compared with 287 in June, according to the Industrial Truck Statistical Association, 208 South LaSalle street, Chicago. Total net value of chassis only was \$1,059,033 in July, compared with \$948,005 in June.

July bookings included: 15 nonelevating platform trucks; 205 cantilever trucks; 11 tractors; 41 cranes; and one special unit.

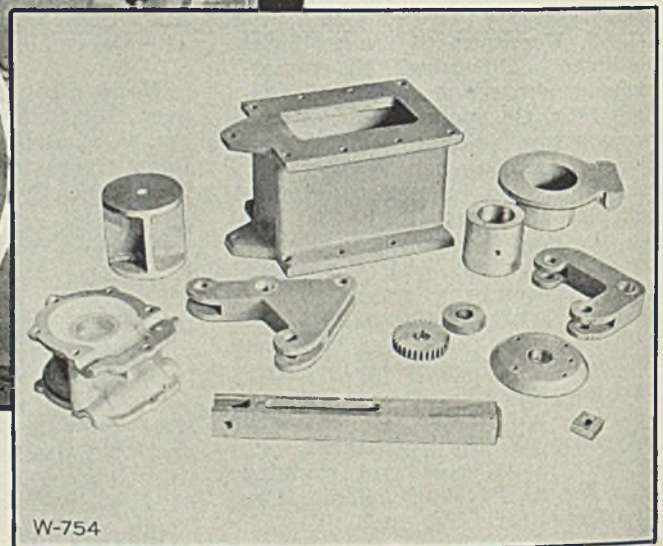
Additional information may be obtained from the association.



"A decided Money Saver"



No. 18 Blanchard with 6" extended column for work 18" maximum height.



W-754

Miscellaneous parts like these are a "natural" for Blanchard Grinders.

Routing miscellaneous parts in small quantities is a problem in any plant—until they come to Blanchard Surface Grinders. "A decided money saver" is what the manufacturer of these pump parts called his No. 18 Blanchard. This is a machine designed not only for production, accuracy, and fine finish, but for quick changeover from job to job. Chucking the work is made easy by the

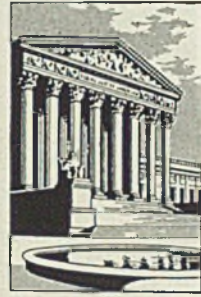
Blanchard One-Piece Steel Magnetic Chuck. Convenient controls make the setting and operation of the machine quick and almost effortless. If you decide to put a "money saver" in your plant, write to Blanchard to find out just what these savings will be.



THE BLANCHARD MACHINE COMPANY
64 STATE STREET, CAMBRIDGE, MASSACHUSETTS, U. S. A.

Windows of WASHINGTON

Defense spending, actual or authorized, now totals forty-eight billion . . . Machine tool prices advance slightly . . . Furniture manufacturers plan adjustments as priorities limit steel supplies . . . Motorists may be asked to turn in old license plates . . . Copper scrap ceiling established . . . Vanadium placed under full priority control . . . Founders win concessions



By L. M. LAMM

Washington Editor, STEEL

WASHINGTON

■ DEFENSE purchases and production authorized now total \$48,087,000,000, according to a progress report issued by the Office for Emergency Management. Of this, \$20,352,000,000 is for the Army; \$15,058,000,000 for the Navy; \$7,000,000,000 for lend-lease; \$5,677,000,000 for other defense agencies.

Total cash disbursements under the authorized program from June 1, 1940, to July 31, 1941, have been \$8,145,000,000.

Commitments for defense plant expansion to June 30, including a total of 2023 projects, totaled \$3,402,000,000. Government commitments covered 428 projects, costing \$2,573,000,000, and private commitments, 1603 projects, costing \$829,000,000. Eight of the projects include both government and private commitments.

1460 Planes Delivered in July

Eighteen thousand prime contracts exceeding \$10,000 had been awarded to May 31.

Deliveries of military equipment in July, OEM reported, included 1460 airplanes, 20 combat vessels and eight merchant ships.

British contract awards in this country from the war's outbreak to July 31 totaled \$3,657,000,000. Payments on orders from June, 1940, to July 31, 1941, were \$2,150,000,000. Outstanding commitments for plant expansions, 47 plants, are \$148,000,000.

Total active strength of the United States armed forces includes 1,886,331 officers and men. The Army has 1,545,400 and the Navy and Marine Corps, 340,931.

Both civil and defense employment have increased sharply since the middle of last year, the report shows. Total civil nonagricultural employment in June was 38,790,000, an increase of 9.5 per cent. Employment in 16 major private defense industries was 2,440,500, a gain of 47.6 per cent.

Enrollment in the national defense

labor training program during its first year is estimated at 1,500,000. As of June 30, 642,000 were in training.

The record of the Defense Labor Mediation Board reveals that 60 of the 64 cases certified to it up to Aug. 15 have been settled and work resumed. One case was returned to the Secretary of Labor; one strike resulted after recommendations; two cases were pending.

The housing authority had allocated 123,433 units—family and single dwellings and trailers, as of Aug. 9. Construction contracts had been awarded for 90,248 and 33,993 had been completed.

Office of Price Administration and Civilian Supply has issued price schedules for second hand machine tools, scrap and secondary aluminum scrap and secondary slab zinc, bituminous coal (revoked May 1), scrap iron and steel, iron and steel products, combed cotton yarn, scrap and secondary materials containing nickel, domestic hides, kip and calf skins, pig iron, cotton gray goods, brass mill scrap, plywood, raw silk and silk waste, copper, sugar, pig tin, burlap, and southern pine.

Thirty-five materials have been placed under broad priority control, 300 items placed on the priorities

critical list, and 12 metals under inventory control. These include antimony, cadmium, ferrous alloys, iridium, lead, manganese or spiegel-eisen, mercury, molybdenum, non-ferrous alloys, tin and the scrap or secondary materials of all these metals.

Materials under industry-wide control include aluminum, magnesium, nickel, nickel-steel, ferro-tungsten, machine tools, synthetic rubber, copper, cork, borax, zinc, polyvinyl, chloride, rubber, tungsten high-speed steel, chromium, chlorine, silk, calcium-silicon, pig iron, steel, silk waste, cutting tools and vanadium.

Reports Machine Tool Prices Slightly Higher

Standard machine tool prices in July were 1.1 per cent higher on the average than in the preceding month, according to the Bureau of Labor Statistics. General level in July was 19 per cent above that of August, 1939, before outbreak of hostilities in Europe.

High level in July was due to price advances on wide range of machine tools. Boring mills advanced by 4 per cent on average; turret lathes 3.5 per cent; engine lathes 2.3 per cent; screw machines 1.0 per cent; and grinding machines and milling machines 0.7 per cent. Price advances on certain individual sizes were greater than this, largest being for the 62-inch to 64-inch boring mill which increased 5.6 per cent.

Furniture Makers, Facing Steel Priorities, Plan Adjustments

Representatives of six major groups in the furniture manufacturing industry met last week with John M. Brower, head of the Furniture Section, Division of Purchases, to consider adjustments the industry must make under the defense program.

Chief problem discussed was the

Correction

■ After the reproduction of the Customer's Certificate of Defense Requirements, Form PD-25C, revised, had been printed (see page 44), OPM made the following correction: Second sentence under item I should read as follows: "In calculating this percentage there have not been included any sales made under an order bearing specific *defense identification* which has already been used by the undersigned to obtain a delivery of materials by re-extension or other application of such *specific defense identification*." Italics denote correction from the form as it appears on page 44.

growing shortage of steel. Manufacture of metal office and household furniture and equipment is estimated to be consuming sheet steel at a rate of 1,200,000 tons per year. No serious shortage has been felt as yet, delays in deliveries being due largely to the industry's high operating rate, from 25 to 50 per cent above last year's level.

Since steel has gone under priority control, however, it is recognized the industry cannot long continue to get anything like its present quantity of steel. It is hoped that by making plans now the industry will be able to adjust itself to the shortage without serious shutdowns or unemployment.

Surrender of Old Auto Licenses May Be Required

A request that state vehicular authorities require motorists to surrender 1941 license plates upon receipt of new 1942 tags has been made by the OPACS, in announcing a program providing for preferential allocation of the minimum tonnage of sheet steel required to produce the 1942 license.

The program is issued, according to OPACS, only because time is too short to enable the states to find substitutes for steel for license tags and since many states already have procured their steel requirements.

Conservation of steel for civilian use is likely to become even more essential in 1942 if the emergency continues and the states are warned that in all probability no sheet steel will be made available for the manufacture of 1943 license tags.

Attention was called to Connecticut's five-year type of automobile license plate, with provision for annual change of date, as one method of conserving steel.

By requiring the surrender of old license plates, the states will add a sizeable tonnage of scrap to the national supplies.

Concessions Granted Foundries Under Pig Iron Order M-17

Certain modifications under the pig iron allocation order, M-17, were made by OPM officials in a conference with gray iron foundry executives, according to W. W. Rose, executive vice president, the Gray Iron Founders' Society Inc., Cleveland.

Where a foundry has or can obtain its complete future commitments sufficiently far in advance to fill in Form PD-69, it must do so. Those jobbing foundries whose business or customers make impossible the complete listing of orders for the succeeding month

called for on PD-69 will follow the order as far as possible and supplement on the same form a similar listing based on the previous month's business. Form must be accompanied by a substantiating affidavit from customers. Where, in considering one firm, a part of the succeeding month's business is known definitely and a part anticipated, the total should not exceed the total for the preceding month from that firm, without authority from OPM, according to Mr. Rose.

The founders had requested a three-month inventory, which was refused.

"Modified Portal to Portal" Work Week Decision Cited

Concurrence of U. S. District Court with "modified portal to portal" opinion on the work week in iron mines of March 15 was called to the attention of the metal mining industry last week by Philip B. Fleming, wage and hour administrator. The decision was that of Judge T. A. Murphree, in Birmingham, Ala., Federal Court, in the suit of the Tennessee Coal, Iron & Railroad Co., Sloss-Sheffield Steel & Iron Co., and Republic Steel Corp. for a declaratory judgment that the miners' work week does not include time spent in reaching their working place after entering the mine.

Defendants in the suit were three locals of the International Union of Mine, Mill and Smelter Workers (CIO). Wage and hour division intervened.

"Judge Murphree's decision should serve as additional notice to the mining industry to schedule their shifts within the 40-hour work week or arrange to pay overtime in accordance with the opinion of the wage and hour division and that of the first United States court to adjudicate iron miners' work time," General Fleming said.

"Failure of employers when the act went into effect October, 1938, to go along with the wage and hour division's original definition of hours worked as including all time during which an employe is required by his employer to be on duty or to be on the employer's premises or to be at a prescribed work place may be costly in some instances. Newspaper reports on the suit of the three steel companies in Alabama placed the wage differential at issue at \$1,500,000."

Pamphlets on Government's Purchase Procedures Published

Information concerning procedures employed by government agencies in making routine purchases for civilian needs was made avail-

able last week by the Department of Commerce to businessmen who desire to sell to federal units. Pamphlet, "How To Sell to the Government for Civilian Needs," may be secured without charge upon application to the department at Washington or any of its field offices, was declared.

Army and Navy purchasing, was also reported, is explained in two booklets published by the respective departments. "Army Purchase Information Bulletin" may be secured from the War Department, Washington, and "Selling to the Navy" will be received upon application to the Navy Department, Washington.

Individuals or companies desiring to transact business with the government may write to the Procurement Division, Treasury Department, Washington, and request to be listed to receive invitations to bid on items they can furnish.

Provisions of Aluminum Scrap Price Schedule Broadened

Broadening of the exemption of toll fabrication from the aluminum scrap and secondary ingot price schedule (No. 2) was contained in a provisional amendment announced last week by OPACS.

Original schedule necessitated that converters charge a higher conversion fee for some forms of wrought aluminum scrap, especially sheet scrap, than for others. The amendment provides the same fee can be charged for all types of wrought scrap, other than forging, and will permit manufacturers to make more uniform arrangements for the reconversion of their scrap into finished material.

Ceiling on Copper Scrap Established by OPACS

Ceiling over copper scrap prices based on 10 cents a pound for No. 1 copper wire and No. 1 heavy copper and providing differentials for leading grades, was established last week by OPACS. Ceiling prices are 2 to 4 cents below 12-cent copper. A uniform dealers' margin of ¼-cent a pound is provided.

No. 2 copper wire and mixed heavy copper, each containing 96 per cent copper, was frozen at 9 cents a pound, and light copper containing 92 per cent copper at 8 cents.

Maximums apply to sales by makers of scrap to buyer's plant or warehouse. Makers may charge a premium of ½-cent a pound on shipments aggregating 40,000 pounds or more.

OPACS Administrator Leon Henderson also warned that lead scrap prices must be reduced, declaring

that in some cases lead scrap is being quoted as high as virgin lead.

Government Receiving Little Domestic Manganese Ore

Excepting some shipments from Anaconda Copper Co., Anaconda, Mont., the United States government has received no manganese ore from companies obtaining awards made in July, 1940, according to OPM officials.

It was only recently reported Reconstruction Finance Corp. subsidiaries had ordered 2,000,000 pounds of manganese ore from various low grade domestic mines last year. The manganese content was to be 48 per cent.

One mine in the state of Washington, it is reported, has delivered 10,000 pounds, but is said to have been helped in its production by the Bureau of Mines.

OPM experts said last week cooperation with Russia will not result in obtaining more manganese from the Soviets. Germany, it is pointed out, has already obtained control of some Russian manganese mines. Furthermore, it would be virtually impossible to arrange for transportation from other manganese mines in Russia.

Vanadium Placed Under Full Priority Control, with A-10 Rating

Vanadium last week was placed under full priority control in an

order signed by E. R. Stettinius, Jr., Director of Priorities.

The order assigns a rating of A-10 to all defense orders for vanadium to which this rating or a higher one has not been specifically granted, and requires the acceptance of such orders in preference to nondefense orders.

Vanadium has been subject to inventory control provided by General Metals Order No. 1, issued May 1, 1941, from which it is now removed. The new order requires that after Sept. 1 a manufacturer wishing to purchase vanadium must file a statement of the uses to which it is to be put, not later than the twenty-fifth of the month preceding that of the specified delivery.

It also restricts deliveries to an amount not in excess of that necessary to a manufacturer to fill his orders on the basis of his current method and rate of production. This restriction does not apply to exports licensed by the administrator of export control, or to vanadium imported by a processor.

Strategic Metals Producers Ask Tax Modifications

Representatives of producers of strategic metals appeared before a meeting of the Senate Finance Committee which is considering the new tax bill. They urged modification of the tax provisions which would remove objectionable features of the bill applying to their industry.

Henry B. Fernald, chairman of the tax committee of the American Mining Congress, raised questions on the substantive basis on which proposed increases in tax rates are to be imposed. He urged that the income tax be applied only to true net income, and that provisions be enacted to avoid imposing crushing tax burdens.

Charles F. Willis, secretary of the Arizona Small Mine Operators Association, protested that under the limitations of the proposed law much of the possible strategic mineral production would be unfairly taxed and put out of business by burdens that could not be carried and, therefore, would not be assumed by potential producers.

Nonmetallic Minerals Advisory Groups Appointed by Stettinius

Priorities Director Stettinius last week announced creation of a special technical committee to advise the Office of Production Management on nonmetallic minerals.

The new group is a special subcommittee of the Advisory Committee on Metals and Minerals which was appointed by the National Academy of Sciences. Clyde E. Williams, director of the Battelle Memorial Institute, Columbus, O., is chairman of the General Advisory Committee on Metals and Minerals.

Membership of other special subgroups of the Advisory Committee—ferrous minerals and ferroalloys, metals, conservation and substitution, and tin smelting and reclamation—has already been announced.

The newly announced Nonmetallic Minerals Group has the following membership:

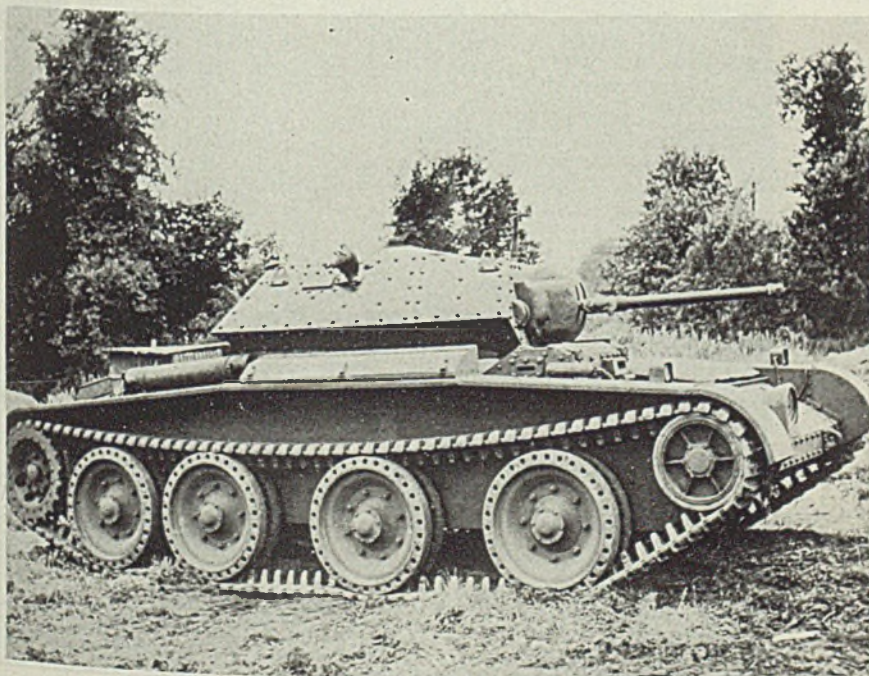
R. P. Heuer, chairman, General Refractories Co., Philadelphia; Paul Tyler, secretary, U. S. Bureau of Mines, Washington; L. E. Barringer, General Electric Co., Schenectady, N. Y.; B. C. Burgess, United Feldspar & Minerals Corp., Spruce Pine, N. C.; W. S. Landis, American Cyanamid Co., New York; G. R. Mansfield, U. S. Geological Survey, Washington; Robert B. Sosman, U. S. Steel Corp., Kearny, N. J.; John D. Sullivan, Battelle Memorial Institute, Columbus, O.

Frank J. Tone, Carborundum Co., Niagara Falls, N. Y.; William M. Weigel, Missouri Pacific railroad, St. Louis; M. M. Leighton, State Geological Survey Division, University of Illinois Campus, Urbana, Ill.; G. A. Bole, Orton Ceramic Foundation, Columbus, O.

R. B. Wittenberg, International Agriculture Corp., New York; Oliver C. Ralston, U. S. Bureau of Mines, College Park, Md.

The new group is now preparing reports for the Office of Production Management on graphite, mica, asbestos and other strategic minerals.

Mark V, Britain's Latest Cruiser Tank



■ New cruiser tanks being built in England are low-slung and "rakish", according to the caption on this photograph passed by the British censor. The tank is known as the Mark V. "It is fast, well-armed for its size, and exceptionally maneuverable." NEA photo

BEHOLD...

A MODERN JOSHUA

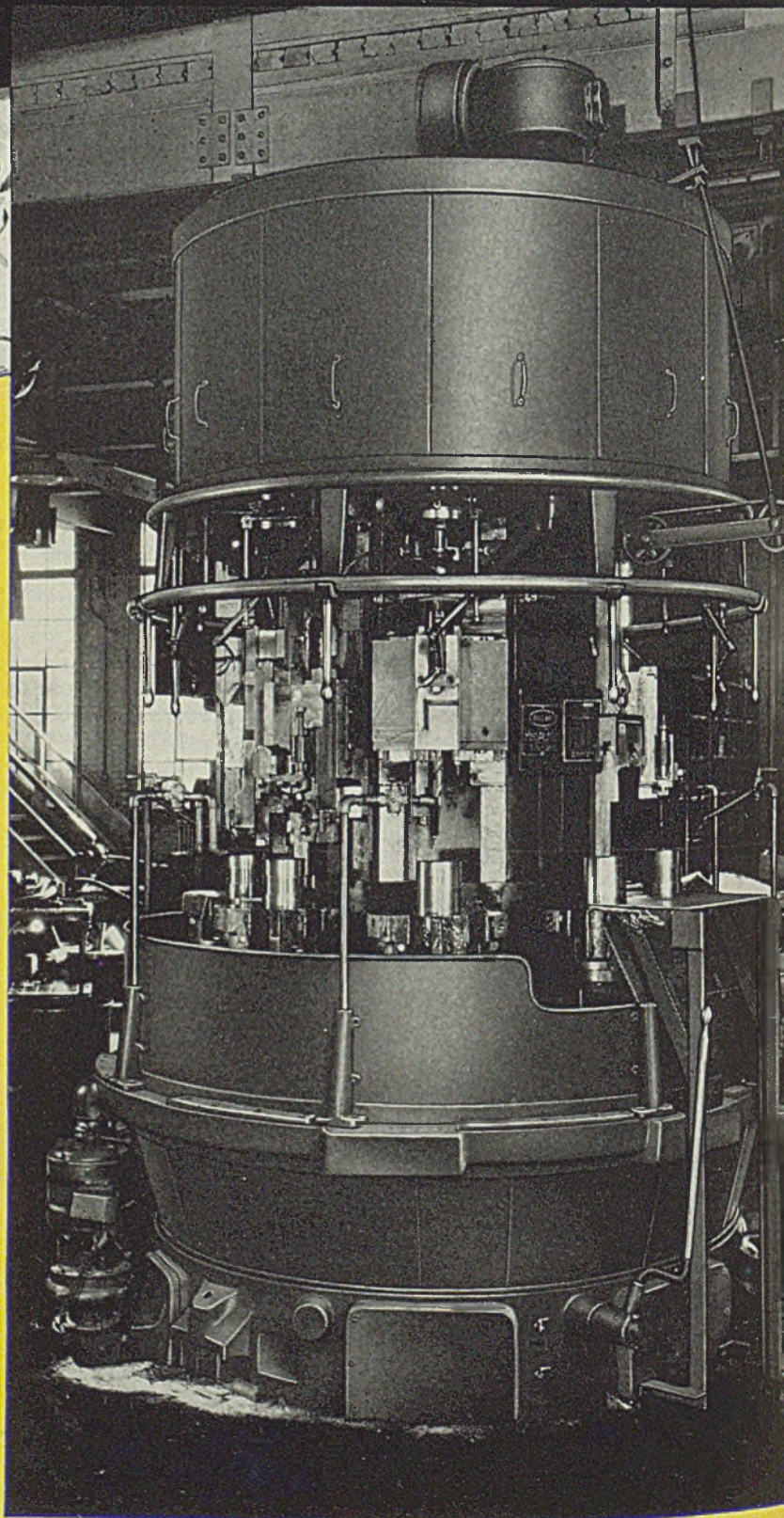


WE are told that at Joshua's command the sun stood still, so he could gain time to complete the conquest of the enemy. The people called this a "miracle."

But when a Bullard Mult-Au-Matic lops off a third, a half, or three-fourths of the machining time on some job, it isn't called a miracle—it's only "modern production."

By whatever name the process is called, the important fact remains unchanged—the Mult-Au-Matic method of independent speeds, independent feeds and simultaneous operation is probably the greatest time-saving machining method ever made available in a standardized machine tool.

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Mirrors of MOTORDOM

Washington decides on 26.5 per cent cut in car output for fall months . . . Fifty per cent for model year . . . Brass to copper to brass for radiator tanks . . . Aluminum-killed steels for deep-drawn stampings practically out . . . See easing of steel supply situation in 60-90 days . . . GM to combine division new model previews



By A. H. ALLEN
Detroit Editor, STEEL

DETROIT

FROM present indications there are going to be several sequences of 1942 models in the automotive industry. The first series will be those now in production or on the verge. They will be ornate affairs, many with completely new body and fender lines and with plenty of bright decorative moldings and trim.

Later in the season, possibly around the 15th of December, will come the second series of 1942 models, with nearly all of the bright work removed except for locks and door handles. Still later there may be other series of models, still in the 1942 type, but further stripped down as the inroads of the defense program on materials become more pronounced.

This was the conclusion to be drawn from the meeting last week in Washington of the OPM, the OPACS and the motor industry advisory committee. Principal discussions centered around that popular topic of curtailment and allocation of production.

OPM and OPACS announced after the meeting that passenger car production will be curtailed 26.5 per cent during the months of August, September, October and November, and progressively more in subsequent months, with the expectancy of a 50 per cent curtailment for the model year ending July, 1942.

Under this program production of passenger cars in the four months will total 817,000 as against 1,113,000 in the same period last year, and 1,560,000 during the four months ended July 1, 1941. The larger companies, General Motors, Chrysler and Ford, will make a 27.6 per cent reduction while other companies, including Studebaker, Hudson, Nash, Packard, Willys-Overland and Crosley will cut 20.2 per cent.

At the same time the Priorities Division of OPM announced it is preparing a blanket preference order to aid truck manufacturers in obtaining scarce materials quickly. This assistance is based on indica-

tions that 1,189,000 trucks, approximately 200,000 more than the output during the model year ended July 31, 1941, will be required in the new model year which began Aug. 1. The estimate of truck requirements includes vehicles for the Army and Navy, the lease-lend program, for export to Russia and for vital transportation needs shown in a study by the Central Motor Transport Committee.

The passenger car curtailment for the first four months of the model year was decided upon to make certain that sufficient materials are conserved for defense, it was explained. On Dec. 15 the quota for December will be announced and it is planned that on the fifteenth of each month thereafter the quota for each month will be disclosed. Following the initial four months the officials explained the quotas may go up or down depending on the materials situation existing at that time.

The elimination of critical materials in trim and other nonfunctional parts is expected to reduce the amount of critical materials required to produce 2,000,000 passenger cars to the following amounts: Carbon steel 2,350,480 tons; alloy steel 301,670 tons; gray iron 496,510 tons; malleable iron 115,920 tons; secondary aluminum 500 tons; nickel 300 tons; zinc 25,000 tons; chromium 2600 tons; copper 40,000 tons; lead 31,000 tons; and tin 2600 tons.

Snuff Out Bright Work By First of Year

Bright interior and exterior trim of all kinds for passenger cars is coming in for a real pinch.

After production quotas have been set, the industry will be inventoried on its stocks of bright metal trim. When these stockpiles are exhausted, the clamp will go down on future

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trim, and the guess is that this will come between Dec. 1 and Jan. 1. Truck builders already have ceased ordering bright work, but will use up current inventories.

Such metal trim is of several types—chrome-plated steel stampings, chrome-plated zinc die castings and stainless steel. The only conceivable legitimate reason for its complete elimination is the conservation of chromium for use in making alloy steel for defense equipment. And it is extremely doubtful if the amount of chromium so released will make much difference in the tonnage of chrome-bearing steel available for defense.

The larger purpose, and the purpose behind much of what Washington is proposing and recommending today, is the psychological factor, the urgent need to shock people into a realization of the critical international situation and the danger in which this country is placed. There is no conception of this acute danger—if indeed there is actually any critical danger—around this section of the country. That defense is the No. 1 job—yes, granted; but that there is any immediate physical danger confronting this country—no.

So the whole program at Washington is now revolving about the urgency of shocking the populace into appreciation of the danger we face, and the method, strangely enough, is so far entirely by indirection, by such tomfoolery as gasoline rationing talk throughout the country, by appeals to contribute old aluminum to help build bombers, by cutting all bright work off automobiles, by air raid warden practices and all the rest.

Sectionalize Fenders To Avoid Deep Draws

The motor industry now is being asked to change back from copper to brass for radiator tanks, this

again according to informed parts sources. Originally the change to copper was sought because of shortage of zinc. Now it appears shortages of copper outweigh the shortages in zinc, so brass again gets the call in radiator tanks. Next week it may be something else.

The situation in deep-drawing steel, that is, in aluminum-killed steel for deep-drawn parts such as front fenders, is becoming increasingly critical, although motor companies were warned of it months ago when first dies were being drawn up for 1942 models. Killed steel of the type used in deep-drawn fenders requires about 5 pounds of aluminum per ton. Although secondary aluminum is satisfactory for deoxidizing open-hearth heats, the supply of this material is as tight as ever, with the result that steel companies have told customers that large tonnages of this steel cannot be supplied much longer.

The answer has been, in most cases, to sectionalize fenders, building them up out of several pieces, none of which requires a severe draw, and attaching a molding over the seam. A good many of the fender producers have designed dies to follow this practice. Chevrolet is understood to be an exception, having preferred to stick to the one-piece deep-drawn fender. How it proposes to meet the lack of aluminum-killed steel is not known as yet. Rimmed steel can be used for such stampings, according to some steel interests, but breakages and rejects are apt to be high.

Priority ratings on replacement parts and trucks are expected shortly from Washington. On trucks 1½ tons capacity and over and on buses of 20-passenger capacity and up, a rating of A-3 is expected. The prediction has been made that a rating of A-10 will be assigned to truck replacement parts which is generally felt to be too low. Priorities for farm tools also are forthcoming.

Incidentally, the fairly complete reorganization of OPM, now before the President, contemplates chang-

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	545,333
June	324,253	362,566	546,274
6 mos. ...	2,055,748	2,539,440	3,148,694
July	218,600	246,171	.....
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†
July 26		105,635	34,822
Aug. 2		62,146	17,373
Aug. 9		41,795	12,635
Aug. 16		46,750	20,475
Aug. 23		45,525	23,732

†Comparable week

ing the automobile advisory committee to a general transportation committee, with subcommittees for each branch but still under the supervision of James S. Adams, former soap manufacturer who is now doing a first-class job in administering the auto advisory committee. The transportation section would comprise four main subdivisions covering railroads, farm equipment, military vehicles, and passenger and commercial vehicles.

Enough Steel for All Soon?

Shipments of steel to the motor companies, and to many parts companies as well, have been running heavy, but there is still a lot of crying about inability to obtain enough material. Inventories of steel are at a high level, in some cases the highest in a long while, but naturally there is a certain amount of unbalance in such inventories.

Imposition of full priorities on

steel and the necessity of all users to file the PD-73 form for every order are considered by some steel offices here as likely to have a sobering effect on buying methods and eventually to bring a little order out of chaos. The immediate result naturally is one of confusion until both producers and consumers have had a chance to understand and digest the routine involved. But in 60-90 days some believe it entirely likely there will be enough steel for everybody, defense and nondefense.

However, such things as the 1,000,000-ton British inquiry for semifinished material which came out last week disturb the prospects for "getting over the hump" in steel. Furthermore there have been several "rush-rush" British releases for steel and other materials which have been put ahead of every single domestic need. They have not been overly large but they upset the established sequence of orders and production.

Play Down Preview Parties

General Motors is understood to be planning to consolidate all its new model previews—at least those of Buick, Oldsmobile, Pontiac and Chevrolet—in a single occasion, now scheduled for Sept. 10 at the Milford, Mich., proving grounds of the corporation. This marks a drastic change in policy for the corporation and one which is not entirely to the liking of the various divisions, since in many ways they are keenly competitive. Cancellation of the New York auto show and the concentration on defense manufacturing, however, have dictated the simplification and unification of new model showings. Chrysler Corp. for several years has displayed all of its new models at one time, a slight exception being this year when Plymouth unveiled its new product earlier before regional dealer meetings.

Packard will preview its 1942 models today, Aug. 25, making a surprise change in its plans to advance the showing by several weeks. Clipper-styled sixes and eights on two wheelbases make up the new line. Nash displayed three series of new models last week to dealers meeting in the East. Studebaker will entertain the press at a mock-military Camp Studebaker near South Bend on Wednesday to give its new models a sendoff. Rumors indicate a burlesque re-enactment of the Civil war, in the spirit of the day. This about cleans up the list except for Ford, where plans have not yet been divulged. Chrysler, as reported here last week, will show all models at a defense production celebration.

General Motors Corp. has purchased \$150,000,000 of treasury notes of tax series B to apply on its 1941 federal taxes.

Highlights of the Automobile Industry in 1940

■ Highlights in the 1941 edition of *Automobile Facts and Figures*, just published by the Automobile Manufacturers Association, Detroit, and available upon request, are the following:

U. S. production, passenger cars and trucks, calendar year 1940	4,469,354
Wholesale value of above production.....	\$3,016,223,064
All registrations, except tax-exempt official cars.....	32,025,365
Official cars, federal, state and local.....	427,496
1940 exports of motor vehicles from U. S. plants.....	229,423
Total motor vehicle taxes.....	\$1,802,748,000
Federal excise taxes only	\$409,185,000
State gasoline taxes	\$870,692,000
Gasoline consumption, except official cars.....	21,913,441,000 gallons
Vehicle-miles traveled in U. S. in 1940.....	292,849,000,000
Employment in motor car production, sales, servicing and operation industries	6,105,003
Wage earners in automobile, body and parts plants.....	447,000
Average weekly earnings	\$34.20

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For today thousands of parts made by Moraine from metal powders serve industry along with products of casting, machining, forging, and other processes. Durex* oil-retaining bearings help motors and machines to run longer, more smoothly, with less maintenance. Porex Filters keep dirt, moisture, and trouble out of fluids such as lubricants, fuel oil, air, and gases. Durex Iron gears, cams, and machine parts simplify designs, improve performance, cut material and production costs . . . Check the growing possibilities of this important field as applied to your specific problems. Get in touch with Moraine.

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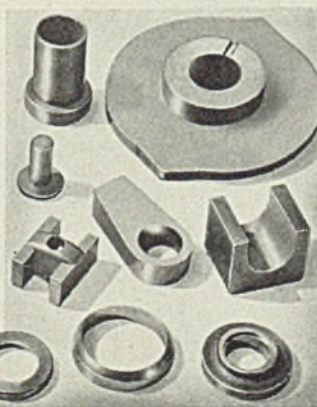
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GENERAL MOTORS CORPORATION, DAYTON, OHIO

CONSERVE VITAL MATERIALS

Powder-made products eliminate scrap material loss in production, replace parts made by die-casting, screw machine, and other methods, substitute for costly or scarce materials.

SPEED PRODUCTION

In making parts from powders, one operation often replaces several, helps get orders out on time or ahead of schedule.

RELIEVE PRODUCTION JAMS

By permitting re-adjustments in production schedules and relieving hard-pressed machines for urgent jobs, parts from powders help get the most—fastest—from existing equipment.

INCREASE PLANT EFFICIENCY

Powder metallurgy offers many time and money-saving cuts to finished products, simplifies production and assembly methods, cuts rejects.

RELIEVE SKILLED LABOR SHORTAGE

In replacing parts made by conventional machining methods, powder-products lighten up production loads on personnel, as well as on equipment.

SIMPLIFY PRODUCT DESIGN

Oil-retaining bearings have made design history by eliminating need for external lubrication, saving weight, improving performance, extending useful life of countless products.

CUT PRODUCTION COSTS

Operations eliminated, costly materials replaced, plant efficiency increased, assembly simplified, maintenance costs lowered—all these mean better products—faster—for less money.

Activities of Steel Users, Makers

WESTERN Electric Co., manufacturing unit of the Bell Telephone System, and currently producing radio and telephone equipment for the armed forces, is letting subcontracts at an average rate of approximately 40 per cent of its government orders. On \$37,000,000 of government orders the company has farmed out more than \$16,000,000 in purchase orders.

Regal Mfg. Co., Coldwater, Mich., manufacturer of diesel and gasoline motors and other products, celebrated its fortieth anniversary Aug. 14. Organized as the Regal Gasoline Engine Co., the name was changed in 1932 to Regal Marine Engine Co., when diesel motors were added to its production. In 1937 the present name was adopted to cover a wider diversification of products, when the company purchased assets of the Roberts Machine Co., Coldwater, and Esco Engineering Service Co., Toledo, O. More than 90 per cent of present production is going into defense work.

Tillotson Clay Products Co., Los Angeles, has changed its name to Refractories Corp.

Wheelco Instruments Co., Chicago, has moved its factory and offices to the Wheelco building, Harrison and Peoria streets.

Harry Harris & Co. has moved its offices from 120 Broadway, New York, to its new office and yards at 33 Passaic avenue, Kearny, N. J.

Cincinnati office of Foxboro Co., Foxboro, Mass., has moved to new quarters at 607 American building, Walnut street and Central parkway.

Stoody Co., Whittier, Calif., manufacturer of hard-facing alloys, grinders and other equipment, recently added another building to its plant at Whittier. The new unit includes a display rotunda, main auditorium and demonstration room.

Lyon Iron Works, Greene, N. Y., manufacturer of material handling equipment, has changed its name to Lyon-Raymond Corp. The company will continue under the same management, directed by George G. Raymond, who has been president the past 19 years.

Thomas Truck & Caster Co., 4170 Mississippi river, Keokuk, Iowa, recently purchased three buildings formerly occupied by the Kellogg-Birge wholesale grocery firm, has

remodelled them and transferred its machinery and equipment to them. The company, employing 80 persons, has booked considerable defense business.

Fellows Gear Shaper Co., Springfield, Vt., has opened a new cafeteria for employes on the top floor of a new storage building. Restaurant has a seating capacity of 200 and serves four meals a day, breakfast, noon dinner, supper and midnight dinner. Approximately 1400 meals are served per day.

Hytensil Aluminum Co., 5811 West Sixty-sixth street, Chicago, recently reported a new alloy, Hytensilite, made from scrap aluminum, and said to more than meet army and navy aircraft parts specifications. J. A. Toleik, company manager, is inventor of the process, details of which are not revealed.

Mine Safety Appliance Co., Pittsburgh, which recently took over and modernized a plant near Evans City, Pa., will shortly begin an additional expansion project at its Pittsburgh works. The company manufactures

a wide range of industrial safety equipment. Recently it has been awarded defense contracts totaling several million dollars.

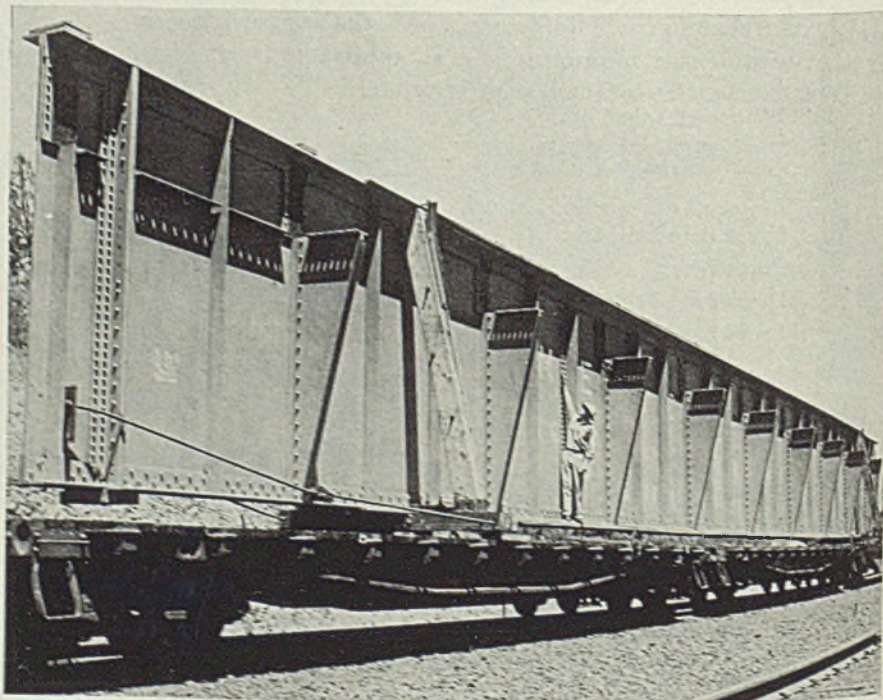
Fire destroyed a large part of the Blasdel, N. Y., plant of the Exolon Co., producer of abrasives, Aug. 19, causing heavy damage. It halted all production, 80 per cent of which had been for defense orders.

Link-Belt Co., Chicago, recently published a 12-page booklet depicting its role in defense production. Pamphlet, largely pictorial, illustrates some of the many applications of Link-Belt products, including parts for tanks, scout cars, aircraft, mortar shells and materials handling equipment. About 80 per cent of the company's current output consists of defense materials, for either direct or indirect orders, according to Alfred Kauffman, president.

Acme Electric Welder Co. has moved to new quarters at 2618 Fruitland road, Los Angeles.

Spraying Systems Co., Chicago, maker of spray nozzles and equipment, is doubling manufacturing capacity, to take care of increased demand for its products.

154-Foot Girder Shipped from Gary to California



One of the largest steel plate girders ever to be transported by rail has been shipped from Gary, Ind., to the United States Bureau of Reclamation at Redding, Calif., to be installed on the Pit river bridge of the Central Valley irrigation project. The girder, 154 feet long, almost 12 feet high, and weighing 97 tons, required three flat cars equipped with special couplings and supports to distribute the weight. Another of like dimensions also will be used in the south approach to the bridge. NEA photo

FINANCIAL

Steel's Rate of Return on Net Worth Is Third Lowest

■ STEEL industry's annual rate of return on net worth in the first half this year was 10.1 per cent, third lowest in a tabulation of 20 industrial groups, according to the National City Bank of New York.

Only the paper products and baking industries had lower rates of return, 9.6 per cent and 6.4 per cent, respectively. In the six months last year, steel's rate was 5.1 per cent.

Highest rate of return among the 20 manufacturing groups was that of machinery manufacturers, 24.2 per cent. In close succession was the miscellaneous metal products group with 24 per cent; auto equipment

manufacturers, 23.8 per cent; automobile builders, 21.1 per cent; and office equipment fabricators, 16.9 per cent.

Average return for 304 companies comprising the manufacturers' groups was 13.2 per cent, compared with 11.2 per cent in the corresponding period a year ago. For 360 companies, representing a cross section of industry, the average rate of return was 12.8 per cent, against 10.8 per cent in the period in 1940.

Republic Steel Declares 50-Cent Dividend on Common Stock

Republic Steel Corp., Cleveland, last week declared a dividend of 50 cents per share on common stock, payable Oct. 2 to record of Sept. 10. Regular quarterly dividends of \$1.50 per share on the

corporation's 6 per cent cumulative convertible prior preference stock, series A, and \$1.50 per share on the 6 per cent cumulative convertible preferred were also declared, payable Oct. 1 to record of Sept. 10.

Board of directors likewise authorized setting aside, Oct. 1, of \$300,000 to the purchase fund for purchase of the 6 per cent cumulative convertible preferred stock, in accordance with Republic's amended certificate of incorporation.

Follansbee Steel Corp. Reports \$167,365 Second Quarter Profit

Follansbee Steel Corp., Pittsburgh, reports net profit in the quarter ended June 30, after depreciation, interest and other charges but before provision for federal income and excess profits taxes, was \$167,365. This compared with net income of \$29,930 in the first quarter this year.

Net income in the first six months totaled \$197,295 before federal taxes, and compared with a \$50,678 deficit incurred in the second half in 1940.

Stove Manufacturers Join In Coal Research Program

■ Twenty-six leading stove manufacturers have joined with Bituminous Coal Research Inc. in sponsoring an enlarged research program to develop improved coal-fired heaters and kitchen ranges at the Battelle Memorial Institute, Columbus, O.

The three-year plan extends and enlarges the program started in November, 1940, for the coal industry. Objectives of the research are stoves for use with bituminous coal that will burn both low and high-volatile coals without smoke, that will automatically regulate the rate of burning, and that will have fuel capacity for 12 to 24 hours of operation at rated output.

Almost 2,000,000 new stoves for use with coal or wood were sold in 1939. Approximately 45 per cent of the 15,000,000 one and two-family homes in cities and towns in the United States are heated with such stoves. With rural heating units, these are estimated to consume 42,000,000 tons of coal annually.

■ Commercial steel castings production in June was 113,988 net tons, compared with 104,971 tons in May and 50,651 tons in June, 1940, according to the Department of Commerce. Bookings in June were 161,512 tons, in May 153,143 tons and in June, 1940 they were 59,661 tons. Production for six months this year aggregated 596,022 tons, compared with 358,767 tons in the first half last year.

101 Consumers' Combined Net Income Up 32.5%

■ COMBINED net income earned by 101 iron and steel consumers in the first six months of 1941 totaled \$150,277,624, compared with \$113,404,086 in the corresponding period last year, an increase of 32.5 per cent.

Two companies reported a loss for the six months, against seven that operated at a deficit in the half in 1940.

In the quarter ended June 30, 83 of the companies reported higher earnings than in the corresponding

period last year. One reported a deficit, compared with 10 suffering a loss in the quarter in 1940.

Combined net profit in the second quarter for all 101 companies was \$78,548,955. This was 30.4 per cent greater than \$60,256,767 reported by them in second quarter, 1940.

Accompanying tabulation summarizes earnings statements of 43 consumers. Prior compilation, including 58, appeared in STEEL, Aug. 11, p. 36:

	Second 1941 Quarter	Second 1940 Quarter	First 1941 Half	First 1940 Half
Allied Products Corp., Detroit	\$510,410	\$231,136	\$719,537	\$277,375
Allis-Chalmers Mfg. Co., Milwaukee	1,793,107	1,639,889	2,389,577	2,609,758
American Bosch Corp., Springfield, Mass.	190,791	212,900	389,222	383,651
Amer. Rad. & Standard Sanitary Corp., New York	1,675,043	1,095,151	3,271,009	1,535,905
American Safety Razor Corp., Brooklyn, N. Y.	9,801	76,375	90,808	212,447
American Stove Co., St. Louis	312,568	397,520	558,157†	508,708†
Blak & Decker Mfg. Co., Towson, Md.	394,848	329,349	955,647†	523,674†
Bridgeport Machine Co., Wichita, Kans.	27,404	38,746*	33,872*	60,795*
Briggs & Stratton Corp., Milwaukee	274,058	271,693	651,087	670,587
Crosley Corp., Cincinnati	371,105†	53,834†	798,634	96,661
Diamond T Motor Car Co., Chicago	212,437	29,336	381,261†	51,872†
Dresser Mfg. Co., Bradford, Pa.	94,260	125,606	375,781	476,481
Electric Auto-Lite Co., Toledo, O.	1,845,180	1,110,467	3,864,777	2,743,251
Electrolux Corp., New York	460,506	376,136	893,422	897,560
Fairbanks Co., New York	29,187	5,329	118,790	14,745
Federal Mosul Corp., Detroit	173,382	121,157	354,545	336,844
Food Machinery Corp., San Jose, Calif.	489,833	357,037	868,236†	663,037†
General Steel Castings Corp., Eddystone, Pa.	1,243,824†	4,032*†	1,690,900	72,958
General Time Instruments Corp., New York	191,226	231,420	618,458	582,325
Giddings & Lewis Mach. Tool Co., Fond du Lac, Wis.	163,309	120,556	328,049	273,186
Graham-Paige Motors Corp., Detroit	46,575*	225,810*	135,442*	546,652*
Greenfield Tap & Die Corp., Greenfield, Mass.	182,287	97,628	320,067	214,261
Holland Furnace Co., Holland, Mich.	577,483	381,625	465,033	262,384
Houdaille-Hershey Corp., Detroit	924,412	711,055	1,517,091	1,472,711
Hudson Motor Car Co., Detroit	220,714	965,954*	243,051†	1,820,199*
Mack Trucks Inc., Long Island City, N. Y.	848,799	702,847	1,508,158	814,296
Master Electric Co., Dayton, O.	221,397	242,685	450,810	450,298
Maytag Co., Newton, Iowa	335,183	342,080	856,389	698,465
Midland Steel Products Co., Cleveland	433,626	493,442	977,270	1,091,124
Packard Motor Car Co., Detroit	977,422	140,773*	1,251,694	102,366*
Pittsburgh Screw & Bolt Corp., Pittsburgh	322,949	122,172	592,570	277,370
Reo Motors Inc., Lansing, Mich.	167,267	418,316*	147,994	785,988*
Savage Arms Corp., New York	876,961	202,789	1,378,127	226,206
Square D Co., Detroit	633,167	504,272	1,397,346	905,130
Standard Tube Co., Highland Park, Mich.	102,376	27,595	182,383	68,838
Stewart-Warner Corp., Chicago	206,268	349,043	770,272	677,245
Terre Haute Mall. & Mfg. Corp., Terre Haute, Ind.	6,382	8,756	45,681	15,437
Thatcher Mfg. Co., Elmira, N. Y.	152,953	158,936	256,145	265,859
Thompson Products Inc., Cleveland	421,907	525,734	923,199	1,047,902
United Aircraft Corp., East Hartford, Conn.	776,854	3,848,077	5,583,350	6,228,106
Westinghouse Air Brake Co., Wilmerding, Pa.	482,045†	133,737	909,820	203,415
Yellow Truck & Coach Mfg. Co., Pontiac, Mich.	1,906,018	1,356,860	4,011,380†	3,204,000†
	1,848,849	1,697,358	3,900,323	2,721,109

*Loss; †indicated.

War Department Places \$172,675,599

National Defense Awards in Week

■ NATIONAL defense contracts reported last week by the War Department totaled \$172,675,599. Ordnance branch of the service placed the greatest number of awards, but contracts for the Air Corps and for a new arsenal comprised almost half the aggregate value in the week. The awards included:

J-M Service Corp., New York, wholly-owned subsidiary of Johns-Manville Corp., New York, estimated \$27,111,620 for management services during construction, procurement of equipment and operation of Kansas Ordnance Plant, Parsons, Kans., including training of key personnel. The plant will load 105 mm. howitzer shells, 155 mm. shells, 100-pound bombs, fuses, boosters and detonators.

Messer, Frank, & Sons Inc., Cincinnati, estimated \$2,036,500 secondary contract for construction of a signal corps storage depot near Lexington, Ky., including three warehouses, five miscellaneous buildings, heating plant, steam distributing system, railroads, water and sewage disposal systems and all other necessary utilities. Architect-engineer award was placed with Allied Engineers & Architects, Lexington.

Ordnance Department Awards

- Accurate Tool Co., Newark, N. J., tools, \$3112.
- Ahlberg Bearing Co., Chicago, ball and roller bearings, \$29,299.
- Allegheny Forging Co., Pittsburgh, forgings, \$3045.30.
- Allegheny Ludlum Steel Corp., Watervliet, N. Y., steel, \$91,960.
- Allis-Chalmers Mfg. Co., Milwaukee, transformers, \$2279.91.
- American Brake Shoe & Foundry Co., American Forge Division, Chicago, punches and dies, \$13,400.
- American Brass Co., Waterbury, Conn., brass and copper bar, copper rod, copper plate, bronze and brass rod, \$27,610.50.
- American Car & Foundry Co., New York, parts for tanks and bombs, \$602,464.02.
- American Cast Iron Pipe Co., Birmingham, Ala., bends, crosses, couplings, elbows, flanges, \$3248.19.
- American Chain & Cable Co., Adrian, Mich., parts for gun carriages, \$3036.
- American Locomotive Co., Schenectady, N. Y., forgings, \$18,656.
- American Safety Razor Co., Brooklyn, N. Y., housings for shells, \$400,925.
- American Steel & Wire Co., Cleveland, chrome molybdenum steel, \$6747.50; Donora Works, Donora, Pa., steel bars, \$225,641.81.
- Armstrong-Blum Mfg. Co., Chicago, hack saw machines, \$30,679.60.
- Atlantic Mfg. Co., Philadelphia, projectiles, \$9500.
- Atlantic Screw Works Inc., Hartford, Conn., screws, \$2556.
- Austin-Hastings Co., Cambridge, Mass., billet shear, \$5696.
- Automatic Machine Products Co., Attleboro, Mass., percussion primers, \$108,000.
- Baldwin Locomotive Works, Standard Steel Works Division, Philadelphia, steel castings, \$372,708.10.
- Barber-Colman Co., Rockford, Ill., cutters, \$2068.80.
- Bausch & Lomb Optical Co., Rochester, N. Y., parts for telescopes, \$15,540.
- Bohn Aluminum & Brass Corp., Detroit, castings, \$44,230.68.
- Boonton Machine Shop, Boonton, N. J., rollers, adapter, funnels, pins, clamps, washers, cutters, tools, \$9699.
- Bridgeport Brass Co., Bridgeport, Conn., brass cartridge discs, \$758,827.50.
- Bridgeport Metal Goods Mfg. Co., Bridgeport, Conn., anvils and primer cups, \$12,003.
- Briggs & Stratton Corp., Milwaukee, fuzes, \$49,987.70.
- Bryant Chucking Grinder Co., Springfield, Vt., hole grinder, \$5395.
- Buffalo Fire Appliance Corp., Buffalo, fire truck, \$3595.85.
- Carlson, G. O., Inc., Thorndale, Pa., steel, \$8795.35.
- Carnegie-Illinois Steel Corp., Chicago, steel, \$12,078.77.
- Chambersburg Engineering Co., Chambersburg, Pa., air operated hammers, \$3050.
- Christiansen, C. B., Newark, N. J., fixtures, extra bushings, plates and blocks, firing pins, \$14,250.
- Cincinnati Ball Crank Co., Cincinnati, burster casings, shell casings, \$378,098.15.
- Cincinnati Time Recorder Co., Cincinnati, O., bursters with metal parts, \$14,834.82.
- Circle Wire & Cable Corp., Maspeth, N. Y., lead cable, \$3430.
- Cleveland Tractor Co., Cleveland, parts for tractors, \$2097.59.
- Colonial Broach Co., Detroit, sharpening machines, \$21,210.
- Columbia Steel & Shafting Co., Pittsburgh, steel bar, \$3863.16.
- Compress Buckle Co., Attalla, Ala., shells, \$920,000.
- Continental Motors Corp., Muskegon, Mich., parts for engines, \$50,827.31.
- Continental Roll & Steel Foundry Co., East Chicago, Ind., castings, \$24,070.
- Crucible Steel Casting Co., Milwaukee, castings, \$2265.38.
- Crucible Steel Co. of America, New York, steel, \$18,179.40.
- Cutter Wood & Sanderson Co., Cleveland, reamers, end mills, drills, \$3396.10.
- Dalzen Tool & Mfg. Co., Detroit, cutting tools, \$3402.60.
- Day, J. H., Co., Cincinnati, screening machines, \$45,310.
- Derbyshire Machine & Tool Co., Philadelphia, punch holders, dies, \$6015.
- Elmes, Charles F., Engineering Works, Chicago, hydraulic straightening press, \$3600.
- Fox Munitions Corp., Philadelphia, gages, \$31,086.20.
- Franklin Equipment Co., Monticello, Iowa, towing equipment and accessories, \$56,396.72.
- General Electric Co., Schenectady, N. Y., cable, transformers, gas carburizing furnace, \$17,473.
- General Metals Corp., Los Angeles, forgings, \$47,250.
- General Motors Corp., Guide Lamp Division, Anderson, Ind., cartridge cases, \$2,450,000.
- General Steel Castings Corp., Eddystone, Pa., steel castings, \$375,091.10.
- Gibson, G. M., Bellevue, Iowa, parts for tanks, \$2437.
- Gisholt Machine Co., Madison, Wis., lathes, \$29,857.20.
- Great Lakes Steel Corp., Ecorse, Detroit, steel, \$2127.04.
- Greene-Wolf Co. Inc., Elizabeth, N. J., chrome nickel steel, \$2855.20.
- Gullett Gln Co., Amite, La., practice bombs, \$37,897.25.
- Hanssen's, Louis, Sons, Davenport, Iowa, wrenches, \$2970.
- Harnischfeger Corp., Milwaukee, electric crane, \$23,160.
- Hartford Electric Steel Corp., Roxbury, Mass., steel castings, \$5304.70.
- Herman Machine & Tool Co., Tallmadge, O., pins of steel tubing, \$14,800.
- Hesse Machine & Mfg. Co. Inc., Boston, gages, \$5717.60.
- Hoe, R., & Co. Inc., New York, equilibrators, \$15,635.16.
- Hoover Co., North Canton, O., fuzes, \$126,000.
- Ingraham Co., Bristol, Conn., fuze plates, \$97,572.
- International Harvester Co., Chicago, forgings, \$8306.40.
- International Machine Tool Corp., Indianapolis, lathes, \$397,332.
- J. C. H. Automatic Machine Works, Philadelphia, parts for shells, \$5280.
- Jones & Laughlin Steel Corp., Pittsburgh, steel, \$5433.98.
- Kearney & Trecker Corp., Milwaukee, milling machines, \$32,379.60.
- Kelly, John P., Philadelphia, bronze castings, \$12,875.
- Kennedy-Van Saun Mfg. & Engineering Co., Danville, Pa., lathes, \$929,700.
- Kern Co., New York, automatic lens grinding and polishing machine, \$8500.
- Lamson Corp., Syracuse, N. Y., gun mounts, \$320,100.
- Latrobe Electric Steel Co., Latrobe, Pa., bar steel, \$2953.60.
- LeBlond, R. K., Machine Tool Co., Cincinnati, lathes, \$353,652.
- Liberty Tool & Die Corp., Rochester, N. Y., dies, \$8430.
- Liberty Tool & Gage Works, Providence, R. I., gages, \$4110.
- Lindberg Engineering Co., Chicago, gas fired furnace, \$2244.
- Manning, Maxwell & Moore Inc., Cleveland, reamers, \$6346.
- McDonald, P. F., Co., Boston, plain carbon steel, \$4730.86.
- McGill Mfg. Co., Valparaiso, Ind., ball bearings, \$2120.
- McKenna Metals Co., Latrobe, Pa., tools, \$5220.
- Mercury Mfg. Co., Chicago, battery operated truck, \$6621.38.
- Metal & Thermit Co., Jersey City, N. J., welding electrodes, \$13,620.
- Michigan Tool Co., Detroit, cutter machines, \$7466.
- Midvale Co., Nicetown, Philadelphia, alloy steel tube forgings, \$85,176.
- Moline Mfg. Co., Racine, Wis., heaters, \$2198.60.
- Monarch Machine Tool Co., Sidney, O., lathes, \$10,001.70.
- Moore Special Tool Co. Inc., Bridgeport, Conn., dies, \$7750.
- Murphy, A. F., Die & Machine Co., Boston, plate stampings, \$3313.20.
- National Automatic Tool Co., Richmond, Ind., drilling machines, \$21,140.
- National Forge & Ordnance Co., Irvine, Pa., alloy steel tube forgings, \$131,840.
- National Twist Drill & Tool Co., Detroit, drills, \$2636.21.
- Nichols, W. H., & Sons, Waltham, Mass., milling machines, \$2574.
- Niles-Bement-Pond Co., Pratt & Whitney Division, West Hartford, Conn., drill shanks and spools, drilling machine, taps, \$19,728.73.
- Noblitt-Sparks Industries Inc., Greenwood, Ind., bombs, \$54,525.92.
- Otis Elevator Co., Buffalo, steel castings, \$29,819.89.
- Peco Mfg. Co., Philadelphia, fuze caps and bodies, lifting plugs, \$705,557.50.
- Pennsylvania Smelting & Refining Co., Philadelphia, antimonial lead, \$209,665.50.
- Pittsburgh Steel Foundry Corp., Glassport, Pa., steel castings, \$486,620.80.
- Precision Mfg. Co., Philadelphia, gages, \$29,400.
- Quality Tool & Die Co., Indianapolis, gages, \$10,108.
- Reliable Tool Co., Irvington, N. J., tools, \$4116.
- Revere Copper & Brass Co. Inc., Rome, N. Y., brass discs, \$54,104.78.
- Rockford Machine Tool Co., Rockford, Ill., machines and equipment, \$30,443.40.
- Ryerson, Joseph T., & Son Inc., Chicago, steel, \$4988.94.
- S.A.F. Steels Inc., Cleveland, steel, \$3906.20.
- Sall, George, Metals Co., Philadelphia.

antimonial lead, \$142,250.
 Seneca Falls Machine Co., Seneca Falls, N. Y., lathes, \$643,610.
 Serval Inc., Evansville, Ind., cartridge cases, \$797,297.44.
 Shanklin Mfg. Co., Springfield, Ill., percussion fuzes, \$160,020.
 Sheffield Corp., Dayton, O., gages, \$36,831.42.
 Sidney Machine Tool Co., Sidney, O., engine lathe, \$8670.
 Sieg Co., Davenport, Iowa, parts for tanks, files, \$3188.82.
 Sinko Tool & Mfg. Co., Chicago, gages, \$6065.
 Slipp-Eastwood Corp., Paterson, N. J., fixtures, cutters, screws, adapters and crank shaft brakes, \$2966.
 Smalley-General Co., Bay City, Mich., thread milling machines, \$33,770.
 Spicer Mfg. Corp., Toledo, O., parts for tanks, \$2933.
 Standard Gage Co. Inc., Poughkeepsie, N. Y., gages, \$3320.08.
 Standard Pressed Steel Co., Jenkintown, Pa., hardening steel cores for bullets, \$4820.40.
 Star Cutter Co., Detroit, cutting tools, \$28,899.89.
 Surface Combustion Corp., Toledo, O., furnaces, \$8513.50.
 Thomas, Seth, Clocks, Thomaston, Conn., gears, pinions, timing disc bushings and collars, \$26,935.
 Thorrez & Maes Mfg. Co., Jackson, Mich., fuzes, plugs, \$3250.
 Thurston Mfg. Co., Providence, R. I., cutters, \$3740.
 Timken-Detroit Axle Co., Wisconsin Axle Division, Oshkosh, Wis., transmission parts, \$3471.25.
 Titan Metal Mfg. Co., Bellefonte, Pa., plunger bodies, \$42,320.
 Tri-Metal Products Corp., Conshohocken, Pa., bronze castings, manganese bronze castings, \$49,279.75.
 Uchtorf Co., Davenport, Iowa, towing equipment, and accessories, \$18,652.64.
 Union Twist Drill Co., Athol, Mass., drills, Woodruff keys, \$6399.50.
 United States Machine Tool Co., Cincinnati, milling machines, \$4379.40.
 U. S. Metals Refining Co., Carteret, N. J., antimonial lead, \$31,875.
 Vanadium-Alloy Steel Co., Latrobe, Pa., steel, \$5866.50.
 Velt & Young, Philadelphia, dies, punches and stems, \$37,303.50.
 Vinco Corp., Detroit, gages, \$8142.
 Vortex Mfg. Co., Claremont, Calif., air cleaner assemblies for tanks, \$2601.30.
 W. & L. Machine Co., Philadelphia, dies and punches, \$8962.50.
 Washburn Wire Co., New York, steel, \$99,322.50.
 Watson-Stillman Co., Roselle, N. J., gap type press, \$6150.
 Williams, White & Co., Moline, Ill., hydraulic bulldozer, \$8650.
 York Safe & Lock Co., York, Pa., elevating mechanism assemblies, \$6042.
 Zimmerman Steel Co., Bettendorf, Iowa, alloy steel, steel castings, \$9449.14.

Air Corps Awards

Air Associates Inc., Bendix, N. J., electric motors, \$109,440.
 American Gas Accumulator Co., Elizabeth, N. J., lighting trucks, \$70,690.
 Aro Equipment Corp., Bryan, O., propeller hub assemblies, oil serve units, \$254,175.
 Bell Aircraft Corp., Buffalo, gun mount adapter assemblies, \$158,400.
 Bendix Aviation Corp., Bendix Products Division, South Bend, Ind., wheel and brake assemblies, maintenance parts, \$214,529.75; Pioneer Instrument Division, Bendix, N. J., fuel indicators, \$170,133; Scintilla Magneto Division, Sidney, N. Y., workshop tool kits, special tool sets and mechanical drawings, Scintilla magnetos, \$311,808.83.
 Boeing Aircraft Co., Seattle, parts for airplanes, \$212,090.15.
 Bonney Forge & Tool Works, Allentown, Pa., pliers, \$7155.
 Carnegie-Illinois Steel Corp., Cincinnati, sheet steel, \$73,668.87.
 Cincinnati Ball Crank Co., Oakley, Cin-

cinnati, lubricating pressure guns, \$18,025.
 Cincinnati Electrical Tool Co., Cincinnati, grinders, \$33,817.50.
 Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati, milling machines, \$186,425.
 Continental Machines Inc., Minneapolis, machines, \$47,500.
 Crescent Tool Co., Jamestown, N. Y., pliers, wrenches, \$107,018.
 Curtiss-Wright Corp., Airplane Division, Buffalo, oil tanks, parts for airplanes, \$380,105.83; Curtiss Propeller Division, Clifton, N. J., propeller blade assemblies, \$131,266.40.
 Cushman Motor Works, Lincoln, Nebr., gasoline motor scooters, \$124,720.
 DeJur-Amsco Corp., Shelton, Conn., photographic exposure meters, \$24,660.90.
 Despatch Oven Co., Minneapolis, electric ovens, \$16,750.
 Douglas Aircraft Co. Inc., Santa Monica, Calif., fire control system, \$86,800.
 Electronic Laboratories Inc., Indianapolis, inverters, \$126,000.
 Elgin National Watch Co., Elgin, Ill., navigation watches, \$57,992.50.
 Fairchild Engine & Airplane Corp., Fairchild Aircraft Division, Hagerstown, Md., airplanes and parts, \$4,746,951.
 Fanco Machine Co., Racine, Wis., presses, \$13,965.
 General Electric Co., Schenectady, N. Y., superchargers, bearings, compressors, \$197,874.49.
 General Motors Corp., Allison Division, Indianapolis, manifolds, screen assemblies, bolts, studs, \$202,760; Delco Products Division, Dayton, O., motor assemblies, \$84,000.
 Great Lakes Steel Corp., Detroit, steel, \$42,650.68.
 Hanson-Whitney Machine Co., Hartford, Conn., hand bottoming taps, \$52,027.08.
 Hayes Industries Inc., Jackson, Mich., wheel assemblies, \$28,437.50.
 Hevi Duty Electric Co., Milwaukee, electric furnaces, \$67,750.
 Homelite Corp., Port Chester, N. Y., gasoline engine driven generators, \$2,141,298.
 Ingersoll-Rand Co., Cincinnati, air compressors, \$50,532.
 Kraeuter & Co. Inc., Newark, N. J., pliers, \$2565.
 Lake Erie Engineering Corp., Buffalo, hydraulic press, \$34,380.
 Lindberg Engineering Co., Chicago, electric furnaces, \$96,500.
 Longines-Wittnauer Watch Co. Inc., New York, parts for clocks and watches, \$128,417.50.
 Master Electric Co., Dayton, O., generator sets, \$138,844.85.
 McCauley Steel Propeller Co., Dayton, O., propeller blades, assemblies, \$408,054.50.
 Meriam Co., Cleveland, manometers, \$40,018.90.
 Niles-Bement-Pond Co., Pratt & Whitney Division, West Hartford, Conn., drills, \$184,390.
 Pump Engineering Service Corp., Cleveland, pump assemblies, \$59,060.
 Racine Tool & Machine Co., Racine, Wis., saws, \$65,168.
 Republic Steel Corp., Massillon, O., steel rods, medium carbon, molybdenum, \$377,100.05.
 Rex Body Corp., Canastota, N. Y., photographic laboratories, \$343,613.18.
 Ryerson, Joseph T., & Son Inc., Chicago, chrome nickel steel, \$77,271.05.
 Saltzman, J. G., Inc., New York, projection printers, \$487,256.
 Selfreat & Elstad Machinery Co., Dayton, O., machines, \$194,331.
 Sly, W. W., Mfg. Co., Cleveland, cabinets, \$26,436.
 Stevens, L. E., Co., Cincinnati, material, labor and equipment for boiler and equipment, \$145,222.70.
 Stewart-Warner Corp., Chicago, lubricating pressure guns, \$7995.
 Taylor-Winsfield Corp., Warren, O., electric welders, \$67,205.
 Unicon Co., Kansas City, Mo., portable

hangars and portable warehouses, \$291,024.
 Utica Drop Forge & Tool Corp., Utica, N. Y., pliers, \$31,200.
 Varley Aircraft Corp., Dayton, O., pelorus assemblies, \$28,750.
 Vlcek Tool Co., Cleveland, screwdrivers, \$25,060.
 Western Industrial Engineering Co., Los Angeles, magnetic inspection apparatus, \$225,000.
 Weston Electrical Instrument Corp., Newark, N. J., generator and indicator assemblies, parts for aircraft instruments, ammeter and voltmeter assemblies, \$401,731.77.
 Wilson, K. R., New York, presses, \$18,488.
 Wright Aeronautical Corp., Paterson, N. J., tools for aeronautical engines, \$87,788.51.
 Zahn Equipment & Supply Co., Columbus, O., presses, \$6982.80.

Quartermaster Corps Awards

American Steel & Wire Co. of New Jersey, Cyclone Fence Division, Los Angeles, fencing and illumination, Camp Callan and Ft. Rosecrans, San Diego, Calif., \$37,909.90.
 Autocar Co., Ardmore, Pa., tractor-trucks, \$492,400.
 Delta Electric Co., Marion, Ind., electric lanterns, \$8100.
 Diamond T Motor Co., Chicago, tank transporters, trucks, \$12,157,530.75.
 Fargo Motor Co., Detroit, trucks, \$131,067.
 Federal Prison Industries Inc., Washington, 39,000 mess trays, \$110,070.
 Foster Stove Co., Ironton, O., grates, \$16,800.
 General Motors Corp., Chevrolet Division, Flint, Mich., light sedan cars, \$643,075.36.
 General Motors Sales Corp., Chevrolet Division, Detroit, spare parts for trucks, \$5664.32.
 Gorsuch, James A., Jr., Jeffersonville, Ind., grates, \$8700.
 Harley Davidson Motor Co., Milwaukee, motorcycles, \$591,915.
 Haven Busch Co., Grand Rapids, Mich., chain link fence, gates, posts, to enclose buildings, Ft. Custer, Battle Creek, Mich., \$8029.
 Highway Trailer Co., Edgerton, Wis., semitrailers, \$134,088.77.
 International Harvester Co., Ft. Wayne, Ind., trucks, \$1,104,854.
 Jackes-Evans Mfg. Co., St. Louis, stove pipe, \$52,200.
 Landers, Frary & Clark, New Britain, Conn., knives, \$73,250.
 Mack Mfg. Co., Long Island City, N. Y., chassis and cargo bodies, \$551,672.
 McGrew Machine Co., Lincoln, Nebr., component parts for tent stoves, spark arrestors, \$29,875.
 Milcor Steel Co., Milwaukee, stovepipe hoods, \$45,975.
 Packard Motor Car Co., Detroit, cars, \$19,196.
 Philadelphia Depot Factory, Philadelphia, military police brassards, \$2085.89.
 Rogers Bros. Corp., Albion, Pa., tank trailers, \$1,637,195.
 Standard Foundry & Furnace Co., DeKalb, Ill., grates, \$9000.
 Stanley, William W., Co. Inc., New York, wire cutter carriers, \$7556.
 Wallace, R., & Sons Mfg. Co., Wallingford, Conn., forks, spoons, \$47,500.
 Watson Automobile Equipment Co., Cincinnati, semitrailers, \$14,105.
 Wheeling Corrugating Co., Wheeling, W. Va., stovepipe hoods and straight joints, \$54,750.
 Wheeling Steel Corp., Martins Ferry, O., tent stoves, \$181,500.
 White Motor Co., Cleveland, six-ton trucks, \$585,000.
 Wickwire Spencer Steel Co., San Francisco, chain link fence and gates, Hamilton field, California, \$8500.
 Winter-Weiss Co., Denver, trailers, \$1,096,200.
 Yellow Truck & Coach Mfg. Corp., De-

Defense Supplies Rating Plan Certification Forms Revised

■ WHEN the defense supplies rating plan was made available May 19, 1941, a customer's affidavit, form PD-25C, was included as the approved form in which customers' sworn statements should be made. This form is superseded by two forms, PD-25D and PD-25C (revised). These two forms are reproduced in full on pages 43 and 44. The old form, PD-25C, is void and should no longer be used.

An official statement regarding the new forms follows:

"Form PD-25D is provided as a replacement for those who have been using the affidavit identification for individual purchases and who have shown thereon the number of the order or certificate assigned a preference rating under which the material covered by that individual order was to be used. For your convenience the new form is a Customers' Certificate of Defense Re-

quirements instead of an affidavit. It is no longer necessary for you to have the statements attested to by a notary public. A misstatement in such a certification, like a misstatement in an affidavit, is a violation of law.

"Form PD-25C (revised) is provided as a replacement of the original Affidavit PD-25C. It is for use by those who give to their suppliers a monthly statement of the percentage of the previous month's dollar volume which was for defense, as defined in the defense supplies rating plan. Please note that this form for the monthly report has also been changed from that of an affidavit requiring the signature and seal of a notary public to a customer's certificate.

"Notice also that paragraph Number 1 clearly specifies that the percentage figure to be entered in the space provided is obtained by analyz-

ing your sales. The requirements as to accuracy of analysis, the requirements as to percentage of your total dollar sales which you are required to analyze and the necessity for retaining your data for the perusal of a representative of the Division of Priorities remain unchanged.

"Either Form PD-25D or PD-25C may be reproduced for quantity distribution, but they must be reproduced in entirety and without alteration. If after a thorough trial of the new forms, you believe that an individual form of your own preparation will better suit your business, send a copy of the form you would prefer to use to Office of Production Management, Division of Priorities, Defense Supplies Rating Plan, 462 Indiana Avenue, Washington, for approval. Until such approval to use another form has been given, do not deviate from the exact reproduction of the new forms attached hereto.

"The only addition which may be made without approval is the typing or printing of your company name and address in the proper spaces in the upper portion of the form."

troit, cargo body trucks, tractor-trucks, truck assemblies, \$4,289,980.32.

Signal Corps Awards

American Automatic Electric Sales Co., Chicago, attendants' cabinets, telephone dials, motor generator sets, timing and telephone sets, telephone central office equipment, \$67,512.10.
Bendix Aviation Corp., Julien P. Friez & Sons Division, Baltimore, anemometers, indicators, thermographs and supports, \$30,272.50.
Bunnell, J. H., & Co., Brooklyn, N. Y., control shafts, \$9030.
Camillus Cutlery Co., Camillus, N. Y., knives, \$6197.32.
Climax Engineering Co., Clinton, Iowa, power units, \$32,732.
Collins Radio Co., Cedar Rapids, Iowa, radio transmitting equipment, \$560,177.50.
Colonial Radio Corp., Buffalo, radio receivers, \$77,300.
Communications Equipment Corp., Pasadena, Calif., remote control equipment, \$11,020.06.
Connecticut Telephone & Electric Corp., Meriden, Conn., test sets, \$17,136.76.
Couch, S. H., Co. Inc., North Quincy, Mass., terminal strips, \$45,466.04.
Federal Telephone Co., Newark, N. J., transmitting components, \$23,325.
Gray Mfg. Co., Hartford, Conn., keys and parts, \$83,605.88.
Hammarlund Mfg. Co. Inc., New York, radio receivers, \$183,071.
International Telephone & Radio Mfg. Corp., East Newark, N. J., radio transmitting equipment, \$40,315.
Jackson Electrical Instrument Co., Dayton, O., battery sets, \$3418.70.
Kellogg Switchboard & Supply Co., Chicago, terminals, telephones, switchboards, \$47,885.
Klein, Mathias, & Sons Co., Chicago, clamps, \$52,519.80.
Lorain Products Corp., Lorain, O., bicycle ringling machines, \$2708.47.
Molded Insulation Co., Philadelphia, telephone equipment, \$45,837.06.
North Electric Mfg. Co., Gallon, O., receivers, \$2362.50.
Rollins Co., New York, hand winches, \$6805.

Seyler Mfg. Co., Pittsburgh, clamps, \$3907.26.
Sparks-Withington Co., Jackson, Mich., antenna weights, \$11,200.
Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y., radios, \$60,000.
Super-Steels Inc., Chicago, axles, \$2523.26.
Technical Devices Corp., Bloomfield, N. J., amplifiers, terminal strips, sockets, capacitors, resistors, and transformers, \$52,204.77.
United States Motor Corp., Oshkosh, Wis., power units, \$23,523.
Utica Drop Forge & Tool Corp., Utica, N. Y., pliers, \$10,846.96.
Western Electric Co. Inc., Kearny, N. J., radio receiving and transmitting components, \$2,483,007.12.
Westinghouse Electric & Mfg. Co., Lima, O., dynamotor units, \$186,160.
Wildn Metal Goods Co., Garwood, N. J., wire pikes, \$6934.72.

Chemical Warfare Service Awards

Crown Can Co., Philadelphia, chemical container assemblies, \$47,371.20.
Eureka Vacuum Cleaner Co., Detroit, brass eyerings, \$6940.
National Stamping Co., Detroit, diaphragm angle tubes, \$64,050.
Wackman Welded Ware Co., Chester, Pa., galvanized drums, \$18,748.
Wood, Gar, Industries Inc., Detroit, cranes and truck bodies, \$31,980.

Medical Corps Awards

Brillo Mfg. Co. Inc., Brooklyn, N. Y., steel wool, \$10,050.
Fisher Scientific Co., Pittsburgh, vacuum pumps, \$2508.
Haslam, Fred, & Co. Inc., New York, surgical instruments, \$7698.20.
Lindner Co., New York, mailing cases, \$10,471.76.
National Mfg. Corp., Plainfield, Conn., folding instrument tables, \$4550.40.
Pelton & Crane Co., Detroit, dental equipment, \$4934.95.
Phillips Metalix Corp., Mt. Vernon, N. Y., radiographic and fluoroscopic machines, \$35,480.
Ransom & Randolph Co., Toledo, O., burs, \$9103.88.
Scharr & Co., Chicago, copper wire and test tube supports, \$4708.10.
Sklar, J., Mfg. Co., Long Island City,

N. Y., forceps \$171,637.50.
Spengler Loomis Mfg. Co., Rockford, Ill., mess equipment, \$6800.
Torsion Balance Co., Jersey City, N. J., prescription scale and balance, \$26,403.
White, S. S., Dental Mfg. Co., Brooklyn, N. Y., carbondum disks, burs, handpieces, forceps and miscellaneous equipment, \$120,231.16.
Witt Cornice Co., Cincinnati, cans, \$8664.52.
Wiss, J., & Sons Co., Newark, N. J., crown shears, \$4080.

Corps of Engineers Awards

Abrams Instrument Co., Lansing, Mich., contour fender with stereoscope, \$63,900.
Allison Steel Mfg. Co., Phoenix, Ariz., air corps demountable hangars, Mesa military airport, Higley, Ariz., \$179,064.
Ames Baldwin Wyoming Co., Parkersburg, W. Va., shovels, \$21,560.
Aqua Systems Inc., New York, aviation gasoline fueling systems, \$146,311.
Barbour Metal B. at Works, Valley Park, Mo., steel work launches, Mississippi river at Rock Island, Ill., \$40,611.
Blickman, S., Inc., Weehawken, N. J., coffee urn batteries and coffee urn combination, Jefferson barracks, Missouri, \$15,003.
Capitol Steel & Iron Co., Oklahoma City, Okla., hangar door assemblies, Aviation Mechanics' school, Wichita Falls, Tex., \$98,000.
Carter Sheet Metal Works Inc., Omaha, Nebr., mess tables, Lowry field, Denver, \$7500.
Chicago Bridge & Iron Co., Houston, Tex., elevated steel water tank, Harlingen airfield, Texas, \$52,800; Los Angeles, elevated water tank, Victorville military airport, California, \$68,890.
Cincinnati Tool Co., Cincinnati, ponton bridge equipment, \$13,377.15.
Electric Service Co., Ann Arbor, Mich., basic lighting system, Dover, Del., airport, \$13,171.
Electric Wheel Co., Quincy, Ill., trailers, \$38,974.
Ellfeldt Hardware & Machinery Supply

(Please turn to Page 110)

(This Form May Be Reproduced Without Change)

OFFICE OF PRODUCTION MANAGEMENT
Division of Priorities

Customer's Certificate of Defense Requirements
(Specific Identification Form)

(Name of Supplier with whom this Certificate is Filed)

(Address)

The undersigned customer hereby certifies to the Director of Priorities of the Office of Production Management and to the above-named Supplier that:

1. The following purchase orders placed by the undersigned with the above-named Supplier on _____ (date of customer's order), were required by the undersigned for the production of Defense Supplies as defined below, all of which Defense Supplies either were or are to be delivered under a preference rating of A-____, assigned to such delivery by Preference Rating Certificate or Order of the Director of Priorities No. _____, which Certificate or Order is now in the hands of the undersigned or, if no rating has been assigned, were or are to be delivered for the account of the agencies listed in (a) 1 and (a) 2 of the definition of Defense Supplies below, which orders for the account of such agencies are now in the hands of the undersigned.

Purchase Order No.

Purchase Order No.

- 2. The purchase orders specified above were not placed with the above-named Supplier in an amount which increased or will increase the undersigned's inventory in excess of a normal supply for any item.
- 3. The facts set forth above are to the best of the knowledge and belief of the undersigned true and correct.

Legal Name of Customer Executing Certificate

By: _____
Signature and Title of Authorized Individual

"Defense Supplies" means and includes any supplies sold under any of the following contracts or orders:

- (a) Any contract or order for products to be delivered to or for the account of:
 - 1. The Army or Navy of the United States, the United States Maritime Commission, The Panama Canal, the Coast and Geodetic Survey, the Coast Guard, Civil Aeronautics Authority, the National Advisory Committee on Aeronautics, the National Defense Research Committee.
 - 2. The Government of Great Britain and the Government of any other country whose defense the President deems vital to the defense of the United States under the Act of March 11, 1941, entitled "An Act to Promote the Defense of the United States."
- (b) Any other contract or order for products which the Director of Priorities determines is to cover direct or indirect defense requirements of the United States, by specifically assigning a preference rating of A-10 or higher thereto.
- (c) Any contract or order placed or offered by any person for the delivery of any material or equipment required by him to fulfill his contracts or orders on hand, which material or equipment is to enter directly or indirectly into the manufacture of the products specified in paragraphs (a) (1) and (a) (2) above.

(The foregoing Certificate constitutes a representation to the above-named Supplier and to the Director of Priorities of the Office of Production Management. Section 35A of the Criminal Code, 18 U.S.C. 80, makes it a criminal offense to make a false statement or representation to any Department or Agency of the United States as to any matter within its jurisdiction. This certificate must be kept on file by the Supplier for inspection by representatives of the Office of Production Management for a period of at least two years.)

7341

(This Form May Be Reproduced Without Change)

OFFICE OF PRODUCTION MANAGEMENT
Division of Priorities
Customer's Certificate of Defense Requirements

(Name of Supplier with Whom this Certificate is Filed)

(Address)

The undersigned customer hereby certifies to the Director of Priorities of the Office of Production Management and to the above-named Supplier that:

1. During the month of _____, 194____, _____ percent of the total dollar volume of sales made by the undersigned to all of its customers constituted Defense Supplies as defined below. In calculating this percentage there have not been included any sales made under an order bearing a specific preference rating which has been already used by the undersigned to obtain a delivery of materials by reextension or other application of such rating.

2. No purchase orders have been placed with the above-named Supplier during the month specified, and no purchase orders will be placed with said Supplier in succeeding months in amounts which will increase the undersigned's inventory in excess of a normal supply for any item.

3. The facts set forth above are to the best of the knowledge and belief of the undersigned true and correct.

Legal Name of Customer Executing Certificate

By: _____
Signature and Title of Authorized Individual

"Defense Supplies" means and includes any supplies sold under any of the following contracts or orders:

(a) Any contract or order for products to be delivered to or for the account of:

1. The Army or Navy of the United States, the United States Maritime Commission, the Panama Canal, the Coast and Geodetic Survey, the Coast Guard, Civil Aeronautics Authority, the National Advisory Committee on Aeronautics, the National Defense Research Committee.
2. The Government of Great Britain and the Government of any other country whose defense the President deems vital to the defense of the United States under the Act of March 11, 1941, entitled "An Act to Promote the Defense of the United States."

(b) Any other contract or order for products which the Director of Priorities determines is to cover direct or indirect defense requirements of the United States, by specifically assigning a preference rating of A-10 or higher thereto.

(c) Any contract or order placed or offered by any person for the delivery of any material or equipment required by him to fulfill his contracts or orders on hand, which material or equipment is to enter directly or indirectly into the manufacture of the products specified in paragraphs (a) (1) and (a) (2) above.

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Aluminum Price Cut 2 Cents as New Plants Are Authorized by Government

■ TWO-CENT per pound reduction in aluminum prices after Sept. 30 was announced last week by Jesse Jones, federal loan administrator, as negotiations for a \$100,000,000 program to expand production of the metal neared completion.

Mr. Jones stated the cut had been promised by Arthur V. Davis, chairman of the Aluminum Co. of America, and that it was arranged during conversations in which the Defense Plant Corp. signed a contract to pay for \$52,000,000 worth of new aluminum plants to be built and operated by Alcoa but owned by the government. Cost of sites will bring the total expenditure to about \$60,000,000.

Price of aluminum ingot will be reduced from 17 to 15 cents a pound and other forms of the metal will be cut at least 2 cents. Aids of Mr.

Jones estimated the reduction will save the government more than \$15,000,000 annually.

The contract with Alcoa provided for building a 400,000,000-pound alumina plant in Arkansas and three aluminum smelting plants with a total capacity of 340,000,000 pounds annually. The three plants will be located at Massena, N. Y., 150,000,000 pounds; at Bonneville dam, 90,000,000 pounds capacity; and near Camden, Ark., 100,000,000 pounds capacity.

The RFC, it was reported, then will offer contracts similar to the ones concluded with Alcoa to the Olin Corp., Union Carbide & Carbon Corp., Reynolds Metal Co., and Bohn Aluminum Co. for additional aluminum plants. The Olin plant will be at Tacoma with a 50,000,000 pound capacity; the Union Carbide

plant at Spokane with a 40,000,000-pound capacity; the Reynolds plant at Listerhill, Ala., with 100,000,000-pound capacity; the Bohn plant at Los Angeles with 70,000,000 pounds.

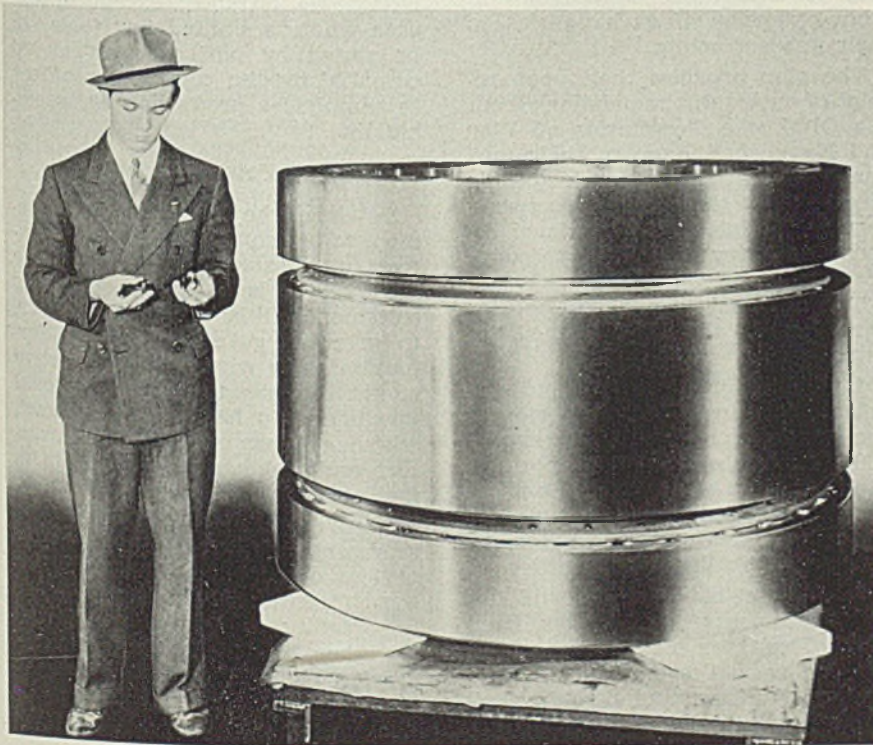
The programs provide for a total expansion of 600,000,000 pounds annually and will bring the country's aggregate capacity to 1,500,000,000 pounds a year when the plants are completed about 15 months from now, Mr. Jones said.

The plants are to be owned by the government and operated by the private companies. The contracts, it was said, will contain no provision for purchase after the defense program. However, officials of the private companies apparently have been given to understand that the government will have no objection to sale ultimately.

600,000,000-Pound Alumina Capacity Increase Recommended

OPM has recommended an increase of 600,000,000 pounds in alumina capacity by bringing into use low-grade bauxite ores. The agency contemplates a new plant in Arkansas, in addition to that to be built by Alcoa. The government would retain ownership of the plant and sell the alumina to aluminum-making companies lacking supplies of their own.

"Largest Capacity Bearings" in Aluminum Mill



■ Four Timken tapered roller bearings to be installed on back-up rolls of the new, 4-high reversing hot mill of Aluminum Co. of America plant at Alcoa, Tenn., have "30 per cent more capacity than any bearings ever built before." The bearings have a 35½-inch bore, 51-inch outside diameter, 36-inch width. They weigh 9070 pounds each and have a mill separating force capacity of 8,300,000 pounds at mill speed.

Each bearing is a four-cage assembly with 34 machine turned, case carburized rolls per cage, or a total of 136 rolls per bearing. Individual rolls are 4 inches in diameter, 7¼ inches long and weigh 23.37 pounds. Cones and cups are forged. Cages are turned.

Size of the bearing is indicated by comparison with the stature of the young man, who is holding one of the smallest bearings produced.

Industrial Machinery

Exports Drop 22 Percent

■ Industrial machinery exports in June declined to the lowest level since late 1939 and totaled \$28,377,146, off 22 per cent from the \$36,508,559 May total, according to the Department of Commerce.

Machine tool exports dropped to \$11,233,804, from \$14,389,047 in May and \$19,021,589 in April. Practically all classes of machines shared in the decline with lathe shipments dropping to \$2,264,671 from \$2,414,299; milling machines to \$2,107,007 from \$2,950,349; drilling machines to \$344,091 from \$676,436; and grinding machines to \$1,435,216 from \$2,061,239.

Exports of other metalworking machinery also declined, to \$2,318,416 from \$2,753,088.

Mining, well and pumping equipment exports, valued at \$2,429,269, were 25 per cent below \$3,249,537 shipments in May.

Construction and conveying machinery dropped to \$2,615,313, or 20 per cent below the May shipments of \$3,358,836.

Power-generating machinery shipments were 40 per cent lower in June at \$2,586,486. Textile, sewing and shoe machinery shipments amounted to \$1,587,701, compared with \$1,957,796 in May; and "other industry machinery" totaled \$5,606,157, a decline of 14 per cent from the May total of \$6,504,963.

OPM To Require More Subcontracting To Avert "Priorities Depression"

WASHINGTON

■ COUNCIL of the Office of Production Management took drastic action last week to head off unemployment resulting from the impact of priorities and the undue concentration of defense orders.

With shortages of materials for nondefense work threatening to close many factories in the near future, the Council approved a sweeping revision of Army and Navy purchasing policies developed in cooperation with the two services and designed to spread defense orders into such plants.

At the same time it announced establishment of the Defense Contract Service as an independent bureau in the OPM, reporting directly to Director General William S. Knudsen and Associate Director General Sidney Hillman. The new bureau will be represented in all OPM divisions, and will provide regional advisory services for plant owners, especially for smaller enterprises seeking defense contracts or subcontracts.

Robert L. Mehornay heads the bureau, and William E. Levis, a member of OPM's Production Planning Board, will assist him as personal representative of Mr. Knudsen and Mr. Hillman.

Alter Purchasing Policies

The OPM Council, composed of Messrs. Knudsen and Hillman and Secretaries Stimson and Knox, adopted a plan of action approved previously by purchasing officials of the Army and Navy and OPM representatives. Principal points of the program include:

1. Special treatment designed to spread defense work wherever practicable into communities or industries faced with unemployment because they cannot obtain materials for non-defense production.
2. Changes in general purchasing policies, including a requirement that a statement as to the percentage of work to be "farmed out" under subcontracts shall be placed in every contract over \$50,000.
3. A requirement that a detailed statement as to subcontracting intentions shall be submitted hereafter with contract proposals of \$250,000 or more.

Special attention for communities or industries threatened with "priority unemployment" will be administered along these lines:

The Priorities Branch of OPM's

Labor Division will inform the Defense Contract Service of the essential facts in each case. The Defense Contract Service will investigate as to the production possibilities and, wherever practicable, the OPM will recommend to the Secretaries of War and Navy a remedial program that may include one or more of the following:

Negotiated contracts (instead of contracts let by competitive bidding) at prices up to 15 per cent above current quotations.

Payments To Be More Prompt

Orders for "a responsible defense association or corporation" organized so that manufacturers may jointly handle defense work that they could not do with their individual equipment.

Elimination of bid or performance bonds when necessary. Inspection of products at plants to facilitate prompt payment.

Reimbursement of prime contractors for additional costs resulting from extension of such policies to their subcontractors.

The plan provides that, upon receipt of such recommendations from the OPM, the Secretaries of War and Navy shall issue to their purchasing departments "such specific directives as they determine necessary in the interests of national defense to carry out the procedure recommended."

The general purchase policies agreed on by the OPM Council are as follows:

1. Bid forms, blueprints and specifications, normally sent to bidders for purchases estimated to exceed \$50,000, will also be sent to appropriate branches of Defense Contract Service. Air mail will be used to the extent practicable and necessary to equalize bidding opportunities.

2. Formal bid openings will not be within less than 15 days from date of call for bids except where the needs of national defense require earlier openings, and awards shall be made promptly.

3. Calls for bids for large quantities to be broken down into optional units to permit smaller concerns to bid for appropriate quantities. Contracting officer shall be empowered to divide an award so that part of it would go to other than the low bidder.

4. Establish more exhibits of specific items broken down into components labeled with description of machine tools and equipment as well as operations required for produc-

tion. Such exhibits to be placed in centers readily available to manufacturers in addition to those already established.

5. Where regional bidding is requested and production facilities permit, awards will be restricted to regional bidders, unless otherwise approved by the head of the Department.

6. Earlier delivery date proposed by bidder shall be weighted favorably in valuing bids, if such earlier delivery is desirable.

7. Require a statement by the bidder with each proposal in excess of \$50,000, stating the minimum percentage of the total which he will subcontract, on a dollar value basis. This statement to become a part of the final contract. The percentage of subcontracting guaranteed by a bidder shall be weighted favorably in valuing bids.

8. No new machine tool delivery, nor priority therefor, to be given a contractor, under existing contracts where a commitment therefor has not been made in the contract, or under new contracts, unless and until the contractors shall satisfy the contracting officer and shall certify that no known qualified subcontracting facilities are available within reasonable distance; except in the case where a limited few tools (to be stated by him) are considered essential by the contracting officer to complete a production or assembly line.

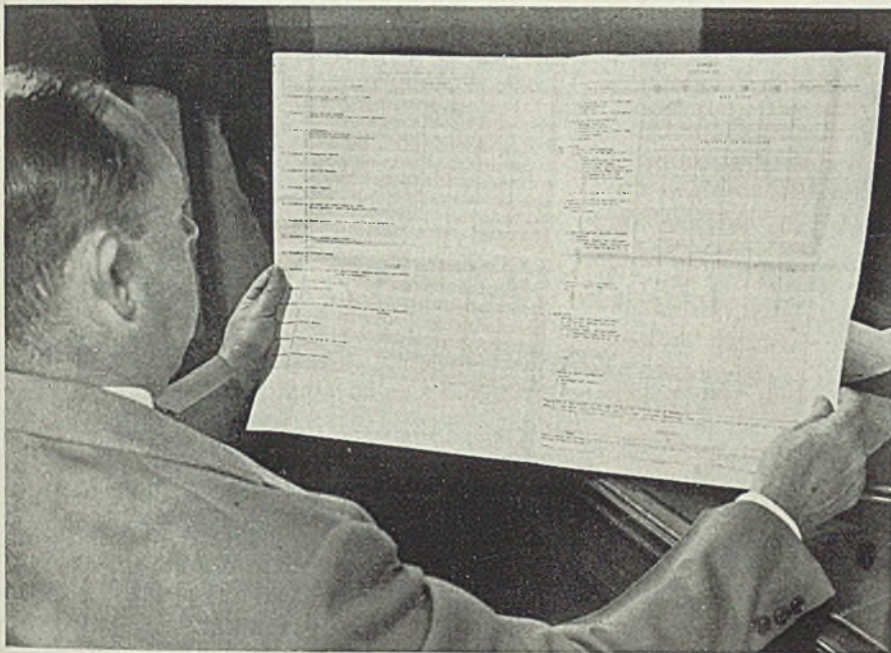
DCS Power Increased

Details of the subcontracting statement to be required with future contract proposals of \$250,000 or more have not yet been worked out. This statement will be designed, however, to give the government full information as to whether a prospective contractor intends to buy additional machinery to handle the contract, whether he has engaged subcontractors and whether he needs help in finding additional subcontractors.

In its new status as a bureau with representation throughout the OPM's various operating divisions, the Defense Contract Service has increased opportunity to inform and advise the other OPM offices and the armed services concerning existing manufacturing facilities and their more effective use.

Machine Tool Shipments Total \$57,900,000 in July

■ Machine tool shipments in July totaled \$57,900,000, according to the National Machine Tool Builders' Association, Cleveland. This compared with output valued at \$63,000,000 in June and \$60,800,000 in May. Shipments in July, 1940, were estimated at \$31,500,000.



■ **MORE PAPER WORK:** 225 members of the steel industry last week received a bulky 24-page questionnaire from OPACS. Administrator Henderson asked that it be filled out "as part of the defense program"

OPACS Wants To "Know All" About Steel Industry's Costs, Operations

■ "OPACS and OPM are going to have to decide on priorities for the return of these questionnaires. If they keep coming at this rate, it soon will be impossible to return them on the dates required."

This was the comment of one harassed steel executive last week as he received the latest (till then) demand for a vast amount of detailed information — OPACS' questionnaire on costs and operations.

The document includes 24 pages (eight blank) measuring 13½ x 17 inches. Although OPACS attempted to limit questions to data "that should be readily available from the steel companies' records" (STEEL, Aug. 18, p. 21) steel men said that many expert-man-hours would be required to answer it. The questionnaire is one of the longest that the government has submitted generally to the steel industry.

"Paper Work" Getting Worse

"Paper work"—which has been mounting steadily ever since the New Deal inaugurated the NRA, social security taxes, and other "reform" measures—has been multiplied by the national defense program.

"It's pretty tough and it's getting worse," remarked the head of one accounting department.

The OPACS questionnaire is intended to make complete cost infor-

mation available to the price agency for use for possible future revision of price schedules.

It includes five schedules covering the year 1940 and the first and second quarters of 1941.

SCHEDULE I requires consolidated profit and loss statements for each of the three periods. Also included are about 40 questions requesting breakdowns of certain profit and loss items. Operating expenses must be broken down in detail.

SCHEDULE II involves 45 items covering production, purchases and sales. For each item there are seven columns. A form is provided for the year 1940 and for the first and second quarters this year. This means a total of 945 entries for this schedule alone.

SCHEDULE III covers wages, salaries, man-hours, employment and major wage and salary rate changes. It requires answers to 26 questions in eight columns, or 208 entries.

SCHEDULE IV includes 29 questions on consolidated balance sheet for each of the three periods. On the reverse side are 50 questions on breakdown of balance sheet items. Each requires four columns, necessitating 948 entries for the schedule.

SCHEDULE V requests historical

data from 1936 to date on capacity, production, sales, profits, expenditures and reserves. Schedule includes more than 50 items requiring answers in seven columns.

Separate statements must be made regarding facilities leased from Defense Plant Corp.; on funded debt, interest and sinking fund requirements; preferred stock and dividend provisions; capital expenditures for which appropriations have been made or which are contemplated.

Separate statements explaining policies and practices regarding inventories, taxes, selected expenses, uncompleted contracts, marketable securities, investments and intangible assets are also required.

OPM Issues Questionnaire on Strategic Metals Stocks

OPM last week sent a questionnaire to manufacturing users of defense metals designed to locate quantities and the whereabouts of strategic metals and to determine what use is now being made of them.

The questionnaire asks users to report quantities on hand and use made during August of antimony, cadmium, chromium, cobalt, copper, ferroalloys, iridium, manganese or spiegeleisen, mercury, molybdenum, nonferrous alloys, tin, vanadium, tungsten, zinc, and scrap metal containing any of these metals.

It is expected that the answers will indicate the use stocks and distribution of 90 per cent of the metals listed.

Another questionnaire will shortly be sent to wholesale dealers in the metals.

Defends Trade Unions As Helping Defense

■ "Back of the headlines, organized labor is bringing home the groceries more bountifully each day."

This was a conclusion stated by Robert R. R. Brooks, OPM labor consultant, speaking before the Canadian Institute of Public Affairs at Lake Couchiching, Ontario, last week.

Mr. Brooks contended that, while strikes and other interruptions to defense material production attract widespread attention, long periods of industrial peace are accepted as commonplace. Trade unions on the whole, he insisted, are functioning to preserve industrial peace, to provide adequate labor supplies at points needed in the defense program, and to bring to the attention of the government dislocations in employment caused by curtailment of raw materials.

Dreamers Tell U. S. To Wake Up

■ AMERICAN people are becoming conscious of the fact that their government is being directed by men enamored of grand vistas.

Those of highest authority in the federal administration are preoccupied by thoughts of distant places and of the hazy, remote future.

They are becoming increasingly annoyed by the, to them, petty and sordid details of affairs at home and of the present.

• • •

The mind of President Roosevelt, first in command, gravitates unerringly to far-off lands—England and Russia. Harry Hopkins, the President's man Friday, lives and dreams in the exciting atmosphere of London and Moscow. Henry Wallace, vice president and assistant-president-to-be, when not absorbed in the problems of the nation's farmlands, lets his mind wander to the far reaches of Latin America.

Meanwhile, capable Secretary of State Cordell Hull, whose job it is to attend to foreign affairs, is practically ignored. Apparently his statesmanship is too realistic for those who see only the glory of grandiose vistas.

All of this visionary concentration on distant places and the far-off future would be commendable—and especially so under present world conditions—if somebody in authority were looking after affairs at home and of the present moment.

True, there are many capable men who are trying to solve today's difficult internal problems, but their hands are tied. Everything pertaining to our domestic economy must clear through the President,

or through his right-hand man Hopkins. If the proposal to put Mr. Wallace in sole command of defense work goes through, then he, with Messrs. Roosevelt and Hopkins, will constitute the clearing house for internal problems.

And not one of the three has any marked sympathy with or understanding of the industrial mechanism required for effective defense!

That is a bleak prospect for a public that already is smarting under the results of past and present neglect by government of pressing, vital, domestic problems.

Certainly that prospect is not reassuring to the operators of small businesses who see the efforts of a lifetime washed away in the confusion of conflicting federal restrictions.

It is not pleasing to employers, employees or the public who see favored unions deliberately sabotaging the defense program.

It is not good news to citizens asked to give up certain privileges at the same time favored minorities are being given more and more privileges.

In reality it should not be encouraging to Churchill and Stalin, whose good sense tells them that in a united America lies the only hope of their ultimate victory over Hitler.

• • •

All of this is known to the public, as witness the apathy toward this emergency, the close vote in the house on extending the term of selective service, etc.

President Roosevelt urges the people to wake up.

It is good advice, but it will not and cannot be heeded until Mr. Roosevelt and others come down to earth.

E. L. Shaner

EDITOR-IN-CHIEF

The BUSINESS TREND

Activity Index Reverses Downward Tendency

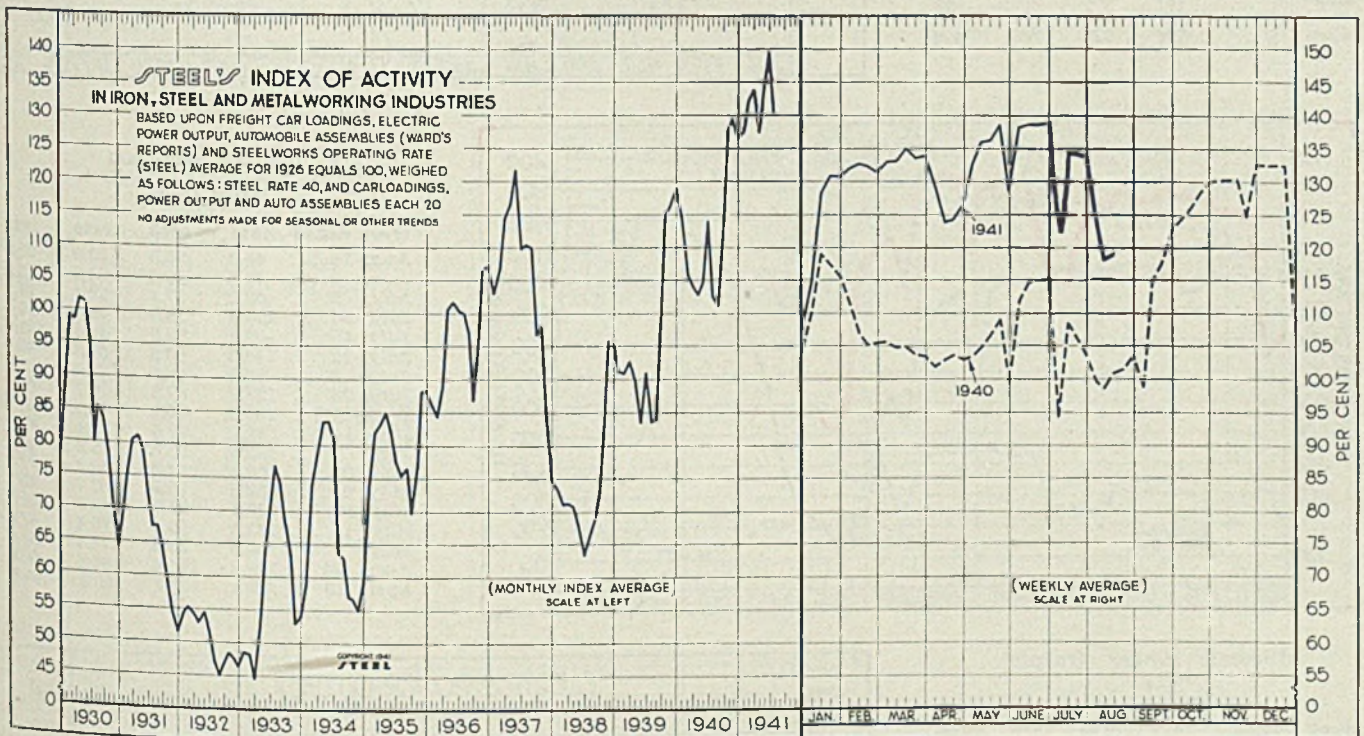


■ FURTHER expansion in some industrial lines continues to be hampered by bottlenecks and raw material shortages. Dislocation in the operating schedules among numerous non-defense industries is becoming acute, resulting from more extensive use of priority controls.

Volume of new business continues to exceed output in most instances, although tightness of the supply situation is gradually forcing a return to hand-to-mouth purchasing in a growing number of industrial lines. Little headway has been made against record

breaking order backlogs built up during the first half of this year.

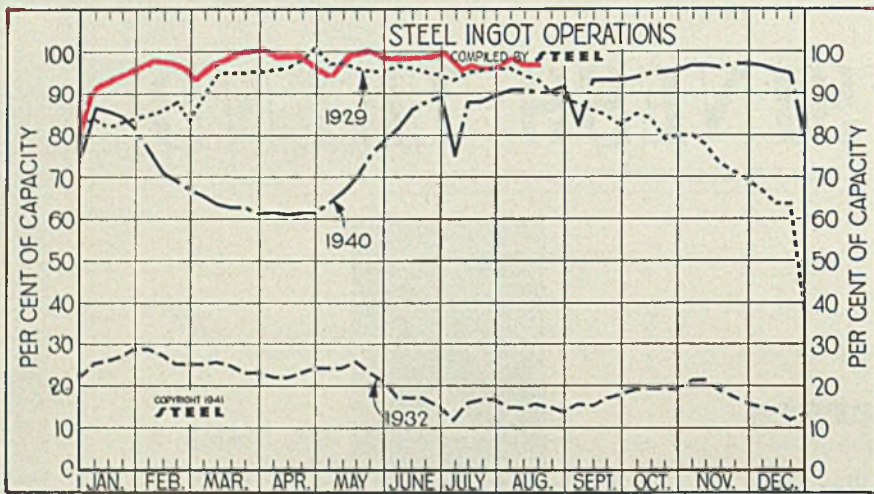
STEEL'S index of activity during the week ended Aug. 16 reversed the recent downward tendency of the preceding four weeks. At the close of the latest period the index stood at 119.3 a gain of 1.2 points over the 118.1 level recorded in the preceding week. A year ago the index stood at 100.8. With the exception of steelmaking operations each of the industrial indicators composing the index recorded a moderate gain during the latest period.



STEEL'S index of activity gained 1.2 points to 119.3 in the week ended Aug. 16:

Week Ended	1941	1940	Mo. Data	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930
May 31	128.4	99.2	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
June 7	138.4	111.9	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
June 14	138.7	114.6	March	133.9	104.1	92.6	71.2	114.4	87.7	83.1	78.9	44.5	54.2	80.4	98.8
June 21	138.7	114.8	April	127.2	102.7	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7
June 28	138.8	115.3	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
July 5	122.9	94.2	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
July 12	134.5	108.5	July	131.2	102.4	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9
July 19	134.1	106.0	Aug.	.....	101.1	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4
July 26	133.3	103.4	Sept.	.....	113.5	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7
Aug. 2	123.7	99.7	Oct.	.....	127.8	114.9	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8
Aug. 9	118.1	98.4	Nov.	.....	129.5	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0
Aug. 16	119.3	100.8	Dec.	.....	126.3	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3

August 25, 1941



Steel Ingot Operations

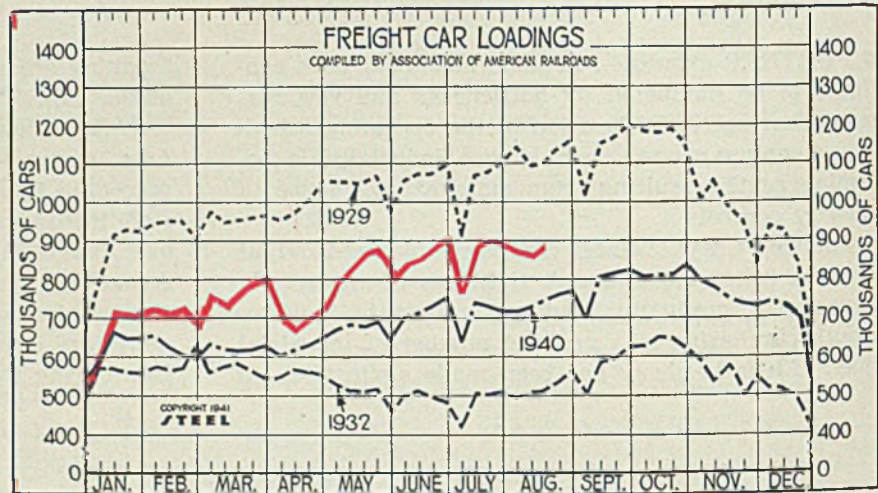
(Per Cent)

Week ended	1941	1940	1939	1938
Aug. 16 . . .	98.0	90.0	63.5	41.5
Aug. 9 . . .	98.0	90.5	62.0	40.0
Aug. 2 . . .	98.5	90.5	60.0	40.0
July 26 . . .	97.0	89.5	60.0	37.0
July 19 . . .	97.0	88.0	56.5	36.0
July 12 . . .	97.5	88.0	50.5	32.0
July 5 . . .	96.5	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
May 10 . . .	97.5	66.5	47.0	30.0
May 3 . . .	95.0	63.5	49.0	31.0
April 26 . . .	96.0	61.5	49.0	32.0
April 19 . . .	98.0	61.5	50.5	32.5

Freight Car Loadings

(1000 Cars)

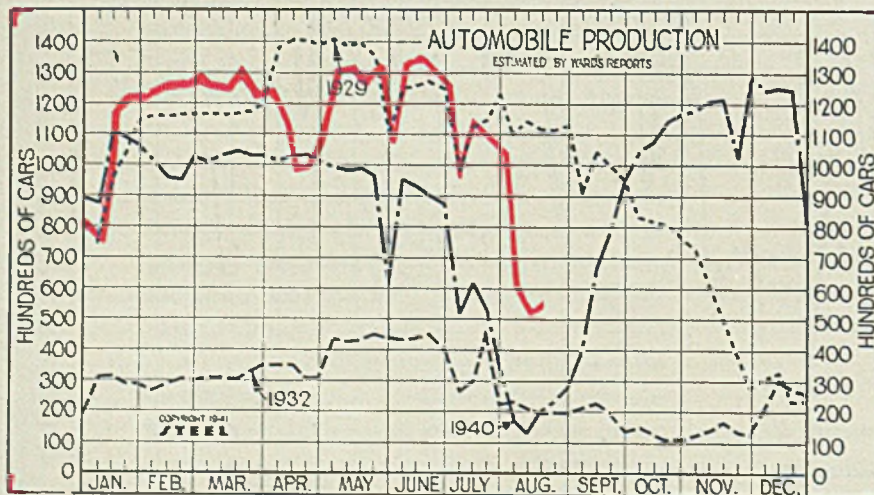
Week ended	1941	1940	1939	1938
Aug. 16 . . .	890	743	674	598
Aug. 9 . . .	879	727	665	590
Aug. 2 . . .	883	718	661	584
July 26 . . .	897	718	660	589
July 19 . . .	899	730	656	581
July 12 . . .	876	740	674	602
July 5 . . .	740	636	559	501
June 28 . . .	909	752	666	589
June 21 . . .	886	728	643	559
June 14 . . .	863	712	638	556
June 7 . . .	853	703	635	554
May 31 . . .	802	639	568	503
May 24 . . .	886	687	628	562
May 17 . . .	864	679	616	546
May 10 . . .	837	681	555	542
May 3 . . .	794	666	573	536
April 26 . . .	722	645	586	543
April 19 . . .	698	628	559	524



Auto Production

(1000 Units)

Week ended	1941	1940	1939	1938
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
May 10 . . .	132.6	98.5	72.4	47.4
May 3 . . .	130.6	99.3	71.4	53.4
April 26 . . .	108.2	101.4	86.6	50.8
April 19 . . .	99.9	103.7	90.3	60.6

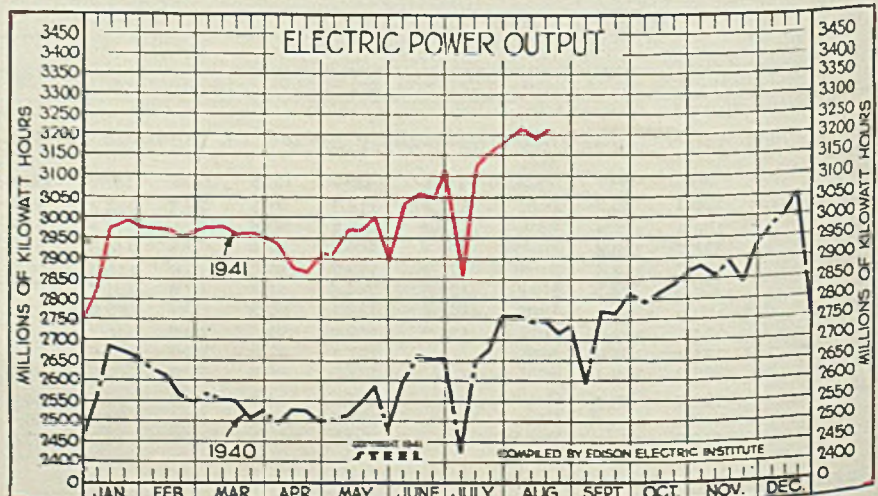


Electric Power Output

(Million kWh)

Week ended	1941	1940	1939	1938
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	2,425	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
June 7 . . .	3,042	2,599	2,329	2,057
May 31 . . .	2,924	2,478	2,186	1,937
May 24 . . .	3,012	2,589	2,278	2,031
May 17 . . .	2,983	2,550	2,235	2,024

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

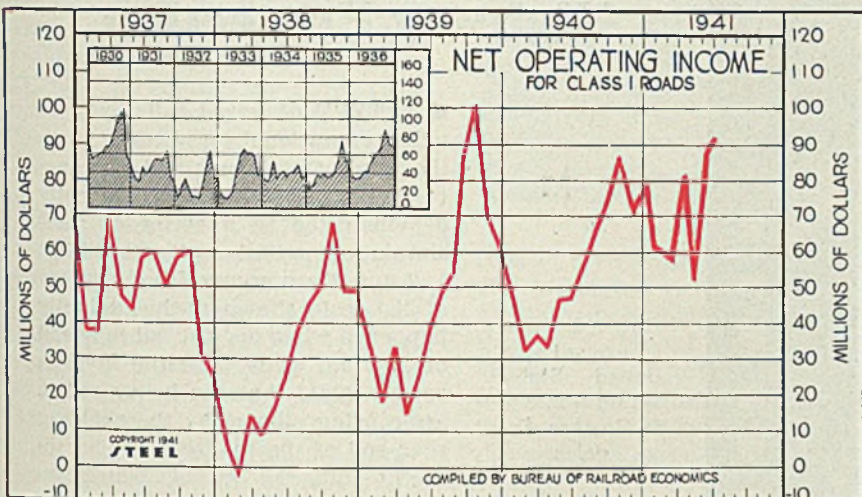
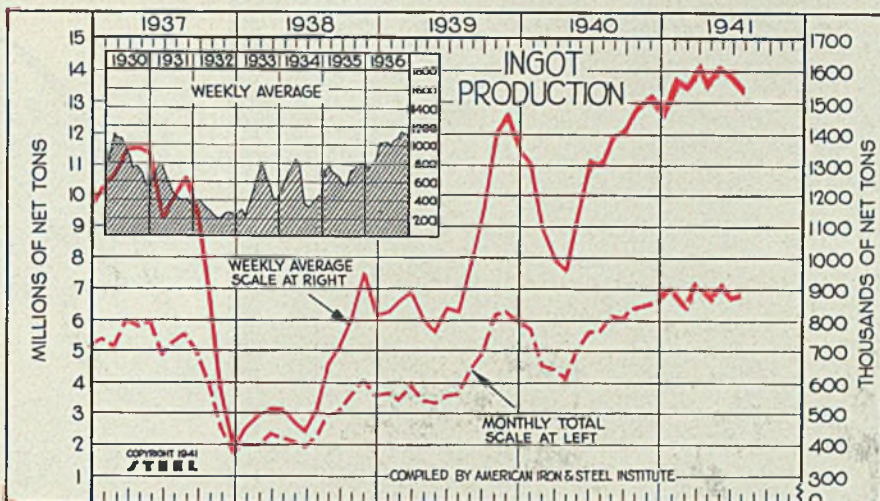


Steel Ingot Production

(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.	.....	6,186.4	.....	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.



Class I Railroads Net Operating Income

(Unit: \$1,000,000)

	1941	1940	1939	1938
Jan.	\$62.36	\$45.57	\$32.89	\$7.14
Feb.	58.49	32.86	18.59	1.91*
Mar.	80.63	36.73	34.32	14.73
April.	52.57	33.82	15.32	9.40
May	88.63	47.08	25.10	16.67
June	93.26	47.42	39.10	25.16
July	.....	57.08	49.01	38.43
Aug.	.....	66.01	54.59	45.42
Sept.	.....	74.19	86.43	50.36
Oct.	.....	86.99	101.62	68.57
Nov.	.....	71.10	70.35	49.67
Dec.	.....	78.79	60.95	49.37

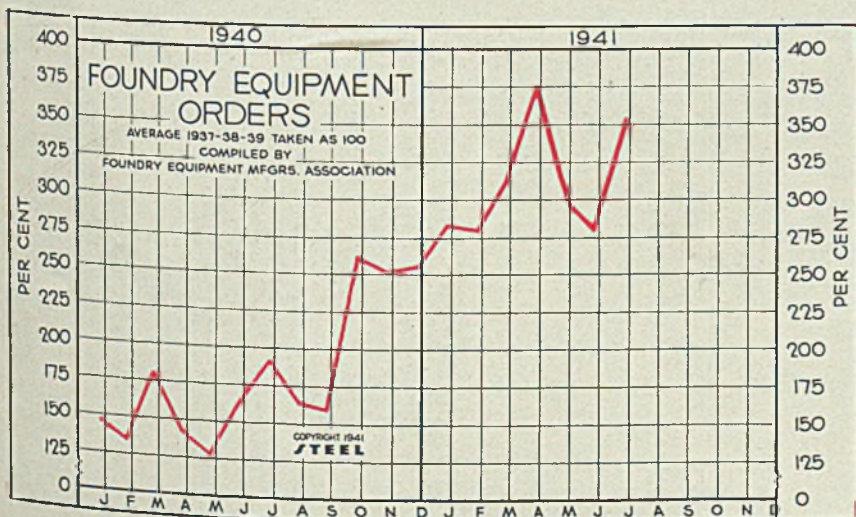
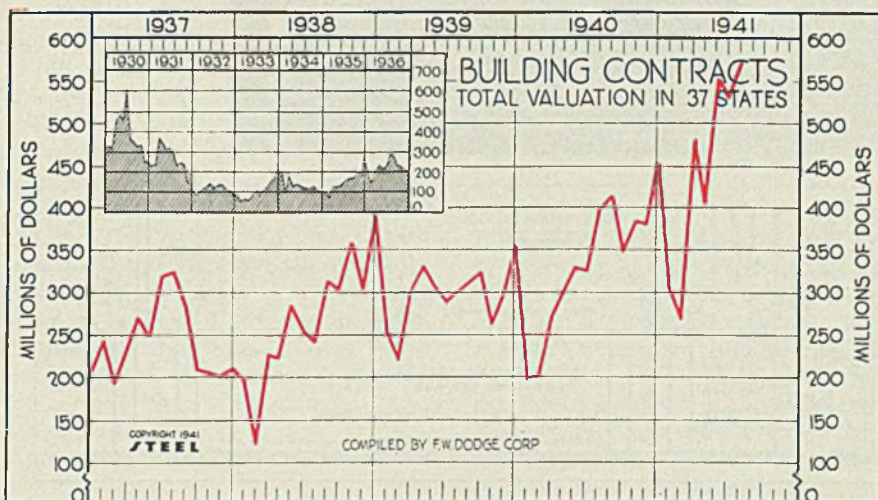
Average \$56.84 \$49.02 \$31.02

*Indicates deficit.

Construction Total Valuation In 37 States

(Unit: \$1,000,000)

	1941	1940	1939	1938	1937
Jan.	\$305.2	\$196.2	\$251.7	\$192.2	\$242.7
Feb.	270.4	200.6	220.2	118.9	188.3
Mar.	479.9	272.2	300.7	226.6	231.2
April.	406.7	300.5	330.0	222.0	269.5
May	548.7	328.9	308.5	283.2	243.7
June	539.1	324.7	288.3	251.0	317.7
July	577.4	398.7	299.9	239.8	321.6
Aug.	.....	414.9	312.3	313.1	281.2
Sept.	.....	347.7	323.2	300.9	207.1
Oct.	.....	383.1	261.8	357.7	202.1
Nov.	.....	380.3	299.8	301.7	198.4
Dec.	.....	456.2	354.1	389.4	209.5
Ave.	.....	\$333.7	\$295.9	\$266.4	\$242.8



Foundry Equipment Orders

Monthly Average

(1937-38-39 equals 100)

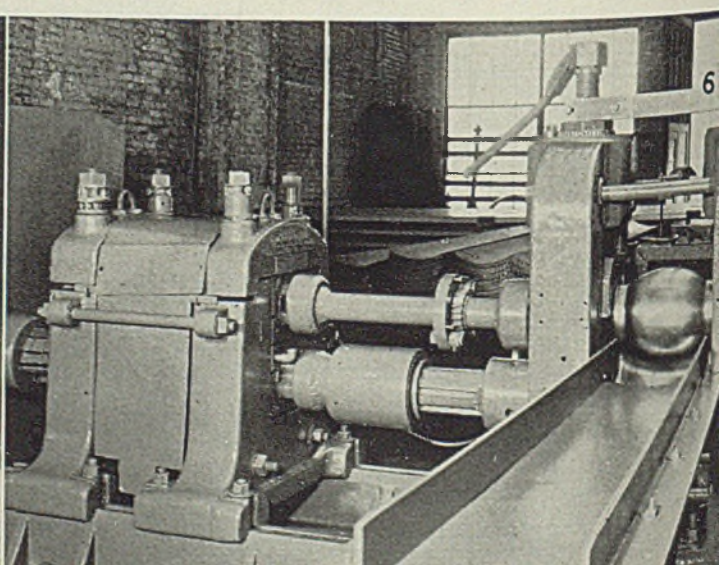
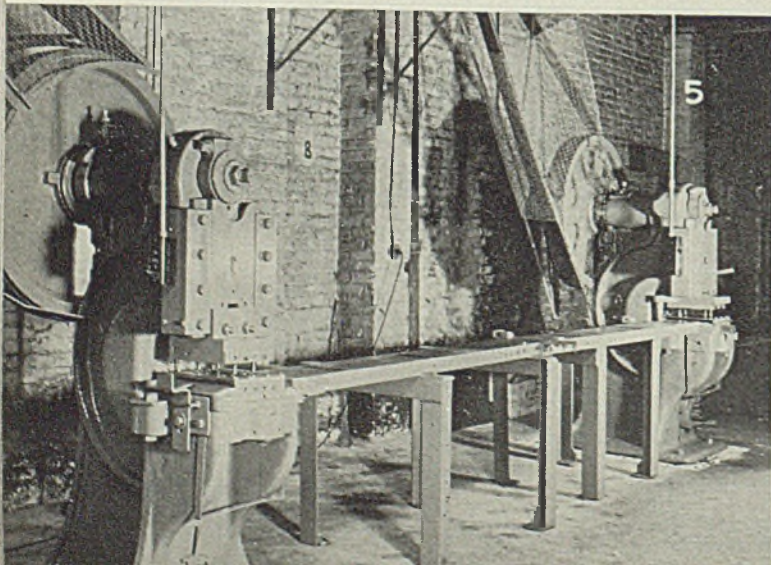
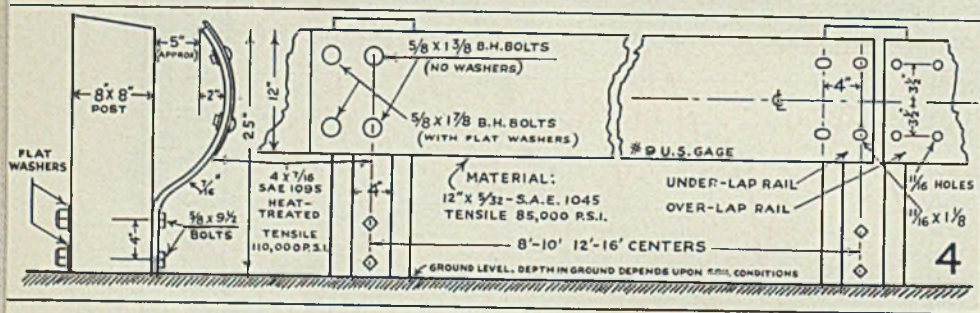
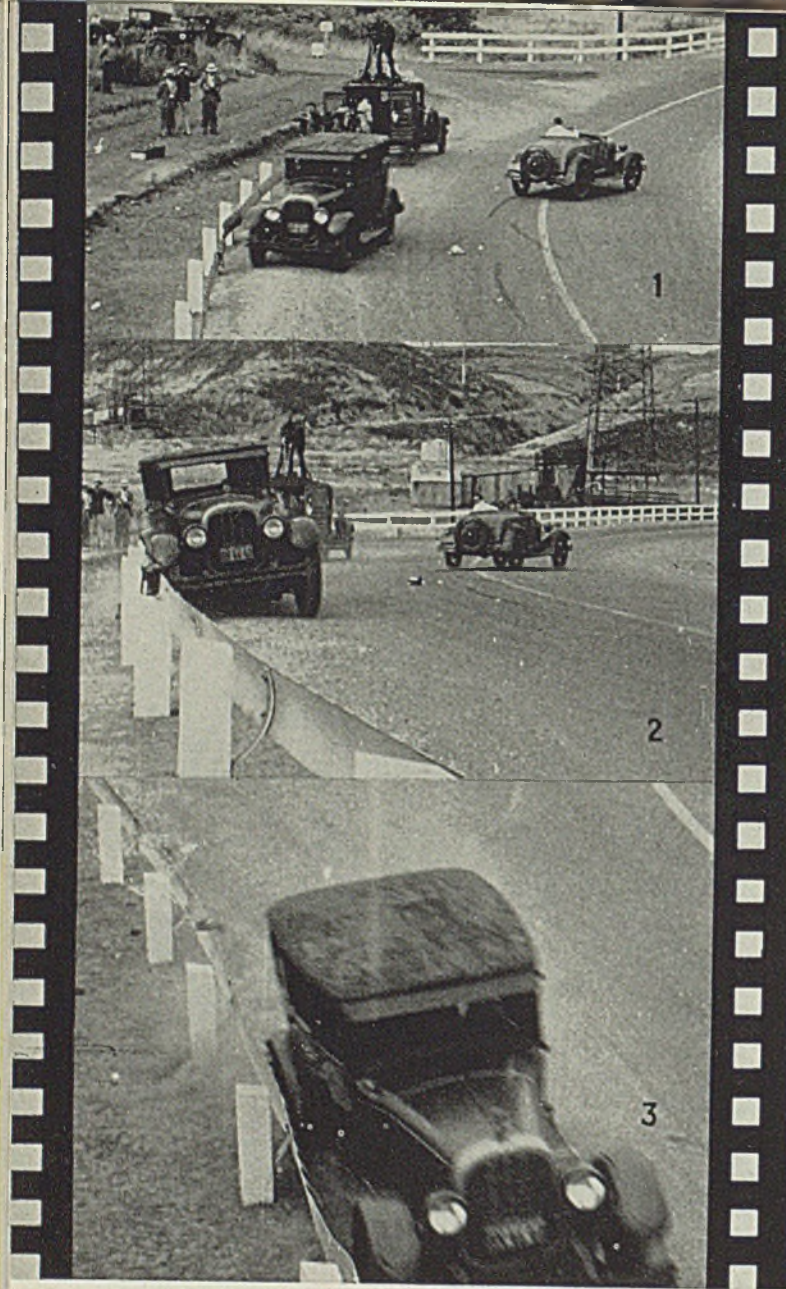
	1941	1940
Jan.	285.3	149.0
Feb.	281.1	135.7
March	315.2	183.2
April	377.2	145.2
May	298.7	129.1
June	281.1	164.9
July	358.1	194.4
Aug.	.....	165.4
Sept.	.....	161.2
Oct.	.....	264.0
Nov.	.....	254.2
Dec.	.....	257.8

"Bounce" Rails

A More Effective Highway Protection

■ A TYPE of guard rail that provides exceptional protection along the edge of highways and also as a road center divider was recently demonstrated in a series of tests simulating actual accidents. Figs. 1, 2 and 3 are scenes from a movie of the tests showing what actually happened when one car cut in ahead of another while traveling at high speed. Note that the heavy sedan, after being clipped by the skidding rear end of the roadster, headed directly into the guard, which deflected its front end, causing the car to swing broadside; and finally the strong reflex or spring action of the rail whipped the rear end of the car around against it, partially deflecting the impact, and finally bounced the car back on the road under control.

Figs. 1, 2, 3 and 9 courtesy United States Spring & Bumper Co., Los Angeles



By H. T. MOORE
President
Tuthill Spring Co.
Chicago

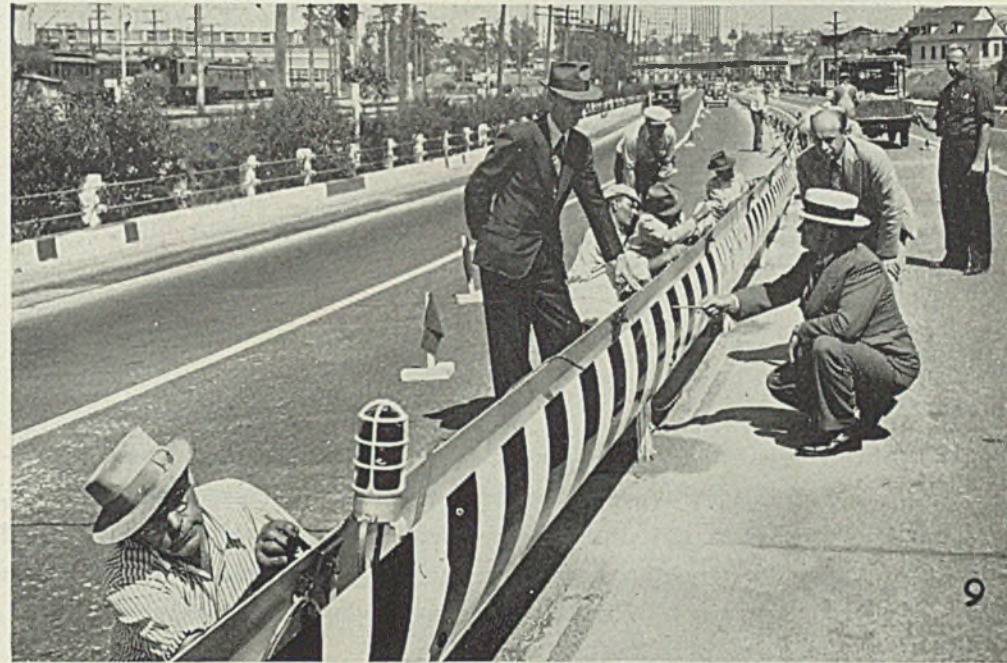
pended and the rail has an opportunity to put the car back on the road under control.

An important development is the use of a double rail of this type as a road center divider. Already such an installation on Ramona boulevard, Los Angeles, Fig. 9, has made a significant reduction in traffic accidents. It requires no more road space than the conventional double line and yet it effectively separates the opposing lanes of traffic. Blinker lights and special painting make divider highly visible at night.

Material for guard rails comes from the steel mills in the form of 9-gage hot-rolled sheet 12 $\frac{1}{2}$ inches wide. Most of it is 13 feet long for mounting on posts spaced 12 $\frac{1}{2}$ feet apart center to center, allowing a 6-inch overlap at the ends of the rails. Of course, various highway specifications involve different post spacings with similar variation in length of rails. See Fig. 4.

Fabricating starts by punching four holes at one end and four slots at the other end of each rail. This work is done in the two presses shown in Fig. 5. A sliding table between the presses facilitates moving material from one press to the other. Each press is fitted with gages, and the table has rollers imbedded in its top to facilitate movement of the material. Because the length of the rails varies, it is not practicable to punch both ends in one operation.

Next, the guard rail panels are passed through a set of forming



rolls to give a curved cross section. The roll stand is shown in Fig. 6. As the panels come from the rolls, they pass through two steel wire brushes, Fig. 7, individually driven by separate motors. These effectively remove all loose scale, leaving the panels in excellent condition for a primer. In Fig. 7 the dust hood and exhaust equipment have been removed to show the wire brushes more clearly. Note the section of roller conveyor seen in the immediate foreground.

The rail panels now are primed by brushing on a coat of red lead or blue lead primer, after which they are stacked for drying as shown in Fig. 8. This paint must be brushed on as it is too heavy to dip or spray satisfactorily. Note the stacking spacers in Fig. 8 are made from channel sections with short T-sections welded as vertical spacers. These units permit stacking to any convenient height.

Some 600 rail panels are produced

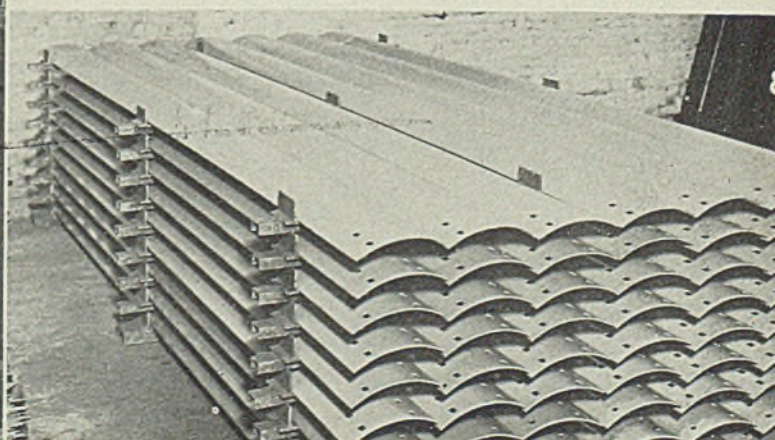
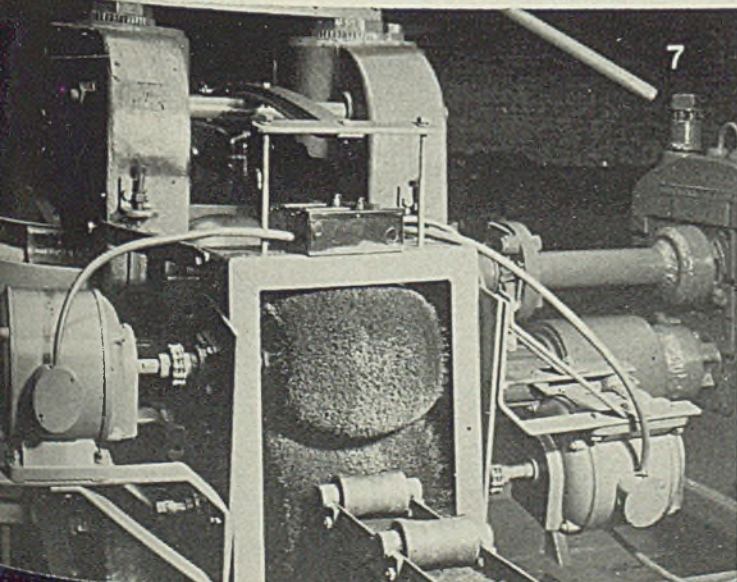
in 8 hours with this equipment. This amounts to 7500 linear feet of guard rail, a total weight of 60,000 pounds, with a linear weight of 8 pounds per foot.

Spring brackets for mounting the rails to wooden posts are shown in Fig. 4 and are made from SAE 1095 stock brought from the mills in the form of steel bars 4 inches wide and $\frac{1}{8}$ -inch thick. These are cut to length on an alligator shear while cold and then the mounting holes punched. Subsequently, brackets are formed while hot on a horizontal bulldozer between solid cast steel dies. Then the formed brackets are reheated to 1600 degrees Fahr. and quenched in oil, followed by drawing at 975 degrees Fahr. to give a hardness of 375 to 430 brinell and elastic limit of approximately 170,000 pounds per square inch.

The completed guard rail under test has successfully withstood impacts from vehicles weighing 4500 pounds striking the rail at a 30-degree angle at speeds up to 40 miles an hour. Such a guard rail is regarded as an important advance in highway protection.

August 25, 1941

53



FORGING GUNS

At Titusville

This account of forging practice in manufacture of guns at the Struthers Wells-Titusville Corp. touches on gun manufacture during 1914-18, then details recent rapid development of gun making facilities and explains step-by-step procedure, including heat treatment and finish machining of 37-millimeter gun forgings, and larger sizes

This Is Number 26 in a Series on Ordnance and Its Production, Prepared for STEEL by Professor Macconochie

■ THE ASSOCIATION of the words "forge" and "Titusville" has a familiar ring for the roots of the existing Struthers Wells-Titusville reach down beyond the middle of the last century to the date of the founding of the original Struthers Wells Co. in 1845. Now the old Titusville Iron Works and the Titusville Forge Co. operate at Titusville, Pa. under single management (since 1937).

A glance over the history of these several organizations reveals the extraordinary diversity of the tasks on which they have been engaged and conveys the impression of a ready and eager acceptance of a job to be done. Pioneers in developing gas and electric welding equipment and in building welded railroad car tanks, the peacetime activity of the Struthers Wells Division centers about stainless steel equipment for a wide variety of industrial purposes; while the Iron Works concentrates on boilers, gas

and diesel engines, rotary lime kilns and a wide variety of riveted and welded work. Over at the Forge, heavy crankshafts and hollow bored forgings are big business or perhaps we should say "were" since guns, and more guns, tend to crowd all else into the background at the present.

The manufacture of guns, however, is no new venture for Titusville Forge. Back in 1917 the famous 75-millimeter gun claimed at-

The author sincerely appreciates the many courtesies extended to him by the president of the Struthers Wells-Titusville Corp., John T. Dillon Jr., and his associates; and thanks the Chief of Ordnance of the United States War Department for his kind permission to present this account of the forging and heat treatment of guns for the United States Army. All photos are by Kurach, and through the courtesy of Struthers Wells-Titusville Corp., Titusville, Pa.

Fig. 1—This reveals what happens when high alloy steels are exposed to uneven variations in temperature—thermal checking

Fig. 2—Stock of ingots in yard of Struthers Wells-Titusville Corp., Titusville, Pa. These will be forged into gun tubes. Flutes ease cooling strains. All photos by Kurach

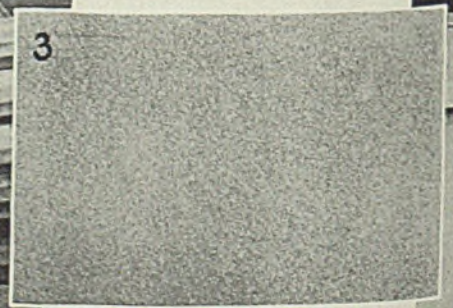
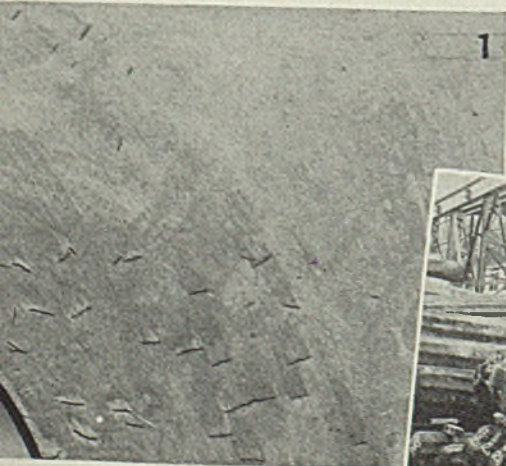
attention and when the present emergency arose existing facilities were improved by the addition of equipment for heat treating and boring all calibers up to 155 millimeter. Further, a large number of special Cincinnati milling machines were installed for roughing breech blocks and rings, locking rings and the like. Early in 1940 the Iron Works Division put in facilities for the finish honing of guns up to 37 millimeters and at this moment of writing are busy enlarging their scope to include calibers up to 105 millimeters.

Further interesting developments in immediate prospect include equipment to complete the job of tube machining, chamber reaming and honing, and rifling the bore, on all sizes up to 4 inch. By the end of August, two new autofrettage installations of the latest design will be at work on tubes up to and including the same caliber. The new buildings required to house these and other needs are rising fast without benefit of rivets, being of all-welded construction; and new and powerful handling facilities will be capable of dealing with forgings weighing up to SIXTY TONS.

Familiar as the Titusville organizations were with the forging and heat treatment of alloy steels, it was perhaps to be expected that the manufacture of gun tubes would present no very worrisome problems which might readily confound others whose experience lay in the field of mild and medium carbon

Fig. 3—Portion of etched slice from an ingot which has been accepted. Note the fine grained structure free from blemish

Fig. 4—Exterior view of direct-fired natural gas preheating furnace



By **ARTHUR F. MACCONOCHIE**
 Head, Department of Mechanical
 Engineering
 University of Virginia
 University Station, Va.
 And
 Contributing Editor, STEEL

steels. The severe and highly responsible duty demanded of a gun calls for unusual properties in the steel of which it is composed and hence nothing but the highest excellence in all that pertains to its manufacture will serve. Steels which might be suitable for the widest range of other industrial uses are not suitable for this use unless relatively free of those minor imperfections which may reasonably be tolerated in less important applications. Further, the steels must meet the most exacting physical tests of yield and ultimate strength, ductility and perhaps also impact resistance.

For these and other reasons associated with resistance to gas erosion and barrel wear, the company purchases electric furnace steel of carefully considered alloy content and requires that big-end-up pouring with a generous hot top be employed to promote the separation of gas and other impurities from the steel as it cools towards the solidification point in the ingot mold. At least 15 per cent of the total weight of the ingot is held in the hot top. Some steel manufacturers also employ unusually large mold tapers in order to promote cleanliness and freedom from deep piping.

Since a gun must of necessity be

Fig. 5—In this portion of the Titusville Forge shop, a 1500-ton hydraulic press is reducing the ingot to a billet of square cross section—the first forging operation

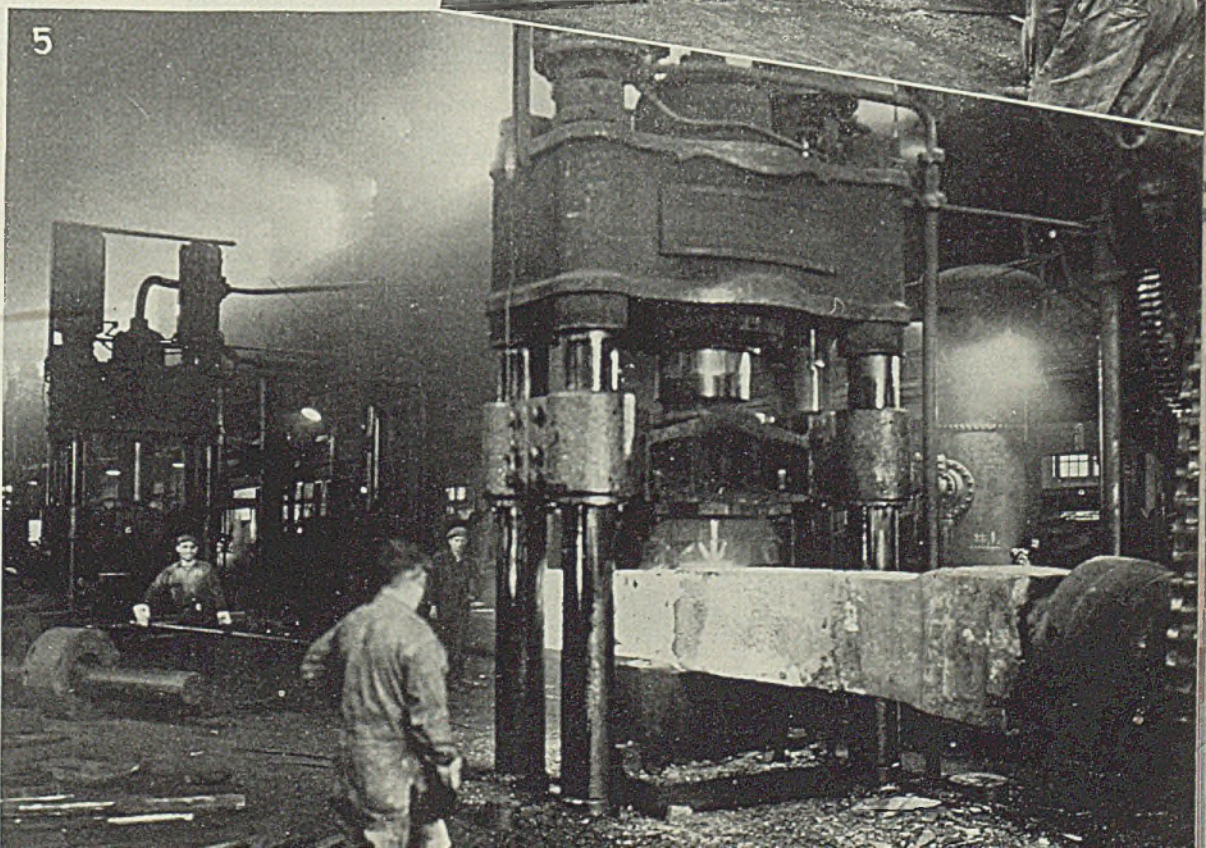


Fig. 6—Here Professor Macconochie is watching a group of forgings while they are being lowered into one of the heat treating furnaces



Fig. 7—From the forging hammer, the gun tube is lowered into a box of fuller's earth where it will take from seven to twelve days to cool to a temperature of 150 degrees Fahr. Note hammer in background at right

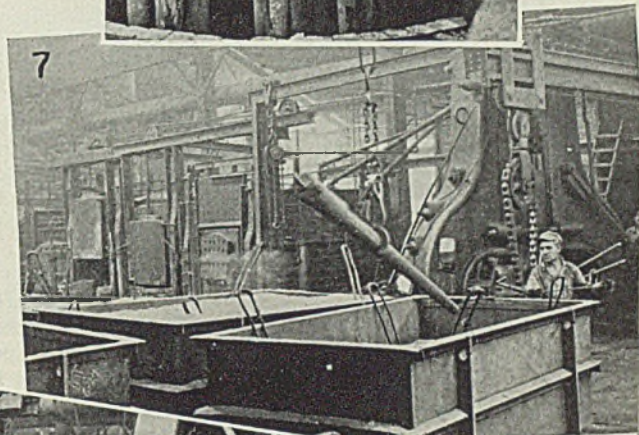
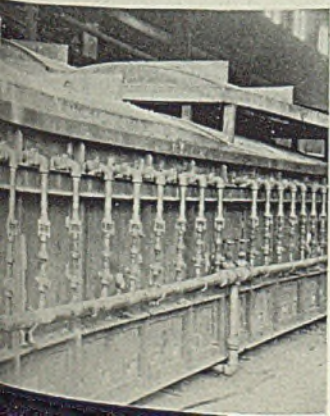
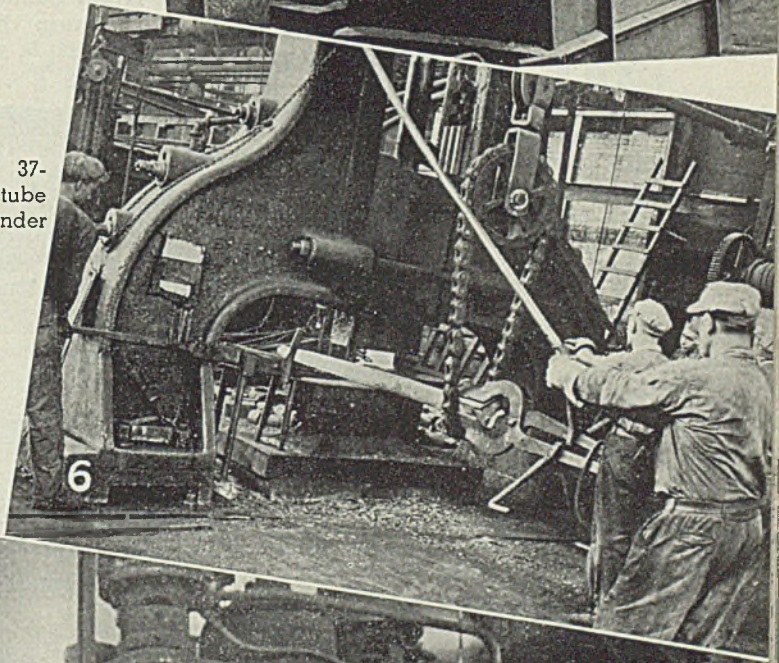


Fig. 6—Here a 37-millimeter gun tube is being forged under a hammer



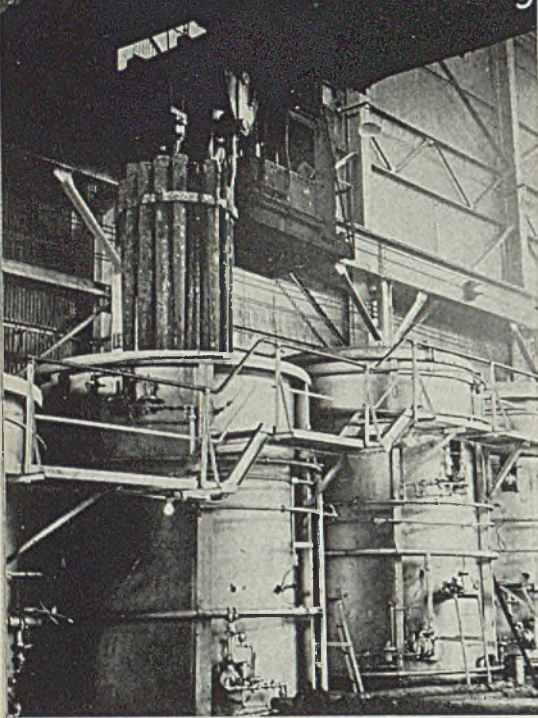


Fig. 9—This batch of 37-millimeter gun forgings is being removed from one of the vertical gas-fired heat-treating furnaces

Fig. 3 shows portion of an etched slice from an ingot which has been accepted, the steel being virtually free from all blemish. The ingots from the heat are now given serial numbers together with the heat number — stamping or metal tag identification being employed.

In conventional practice, the ingots after stripping from the molds are lowered into soaking pits before they can cool. However, the Titusville Corp. purchases its stock, so a start must be made from the cold and heat applied with the greatest circumspection. If these alloy steel gun forgings were treated like ordinary mild or medium carbon steel, checks of considerable severity would develop. Hence, especially in the case of the ingots of larger diameter, practice here is to pre-warm the ingots in a water bath which is gradually brought up

forged down (or rolled to billet form) from an ingot whose diameter-length ratio is much greater than that of the finished gun forging, considerable drawing out takes place in the direction of the axis. Hence, if inclusions, segregations and the like were present, their influence would be apparent principally in the transverse test. Note that this is the direction in which the ductility and yield strength are of the greatest importance.

In the manufacture of gun steel, basic electric furnaces of about 50 tons' capacity are commonly employed. The presence of chromium, nickel, molybdenum, vanadium and sometimes other alloying elements demands the utmost care in pouring and cooling the ingot since, until the gun tube has reached its final tempered condition, the steel of which it is made is peculiarly liable to the thermal checks and flakes characteristic of high alloy steels exposed to uneven variations in temperature. This condition is exhibited in Fig. 1 which shows a quarter of a section of a gun tube made from such defective material. Fig. 2 shows part of the ingot pile in the company's yard. The heavy flutes on the outside of the ingots are designed to ease the inevitable strains accompanying cooling.

Before a heat is accepted, the top and bottom from one ingot are cut off, ground and polished, then boiled for an hour in hydrochloric acid diluted with an equal quantity of water. Any imperfections which might render the steel unserviceable are thus revealed at the outset before any forging work is done.

Fig. 12—Accuracy of bore is determined by use of pivoted search bar as shown here. A dial gage reveals amount "out"

to a temperature of 200 degrees Fahr. by steam. At this temperature, the ingot enters the preheating furnace shown in Fig. 4 where its temperature is raised to 1200 degrees Fahr. One hour is allowed for each inch of ingot diameter.

These preheating furnaces are simply constructed. They are rectangular in form with depth sufficient to avoid direct flame impingement on the charge. They are heated by the natural gas jets arranged in a row near the top of the side wall and directed horizontally towards the opposite side. No provision is made for venting.

The ingot is now ready for transfer to the heating furnaces, where its temperature is raised steadily to about 2000 or 2100 degrees Fahr., care being taken to soak thoroughly at forging heat. This transfer is accomplished by a manipulator known as the Brosius auto floor charger. It seizes the ingot by the hot-top tong and thrusts it through the furnace door. The charger has a rear "rudder wheel" electric drive, power arriving via a self-winding cable. The arrangement is exceedingly flexible and highly responsive.

When ready for forging, the ingot is seized once more by the hot-top tong and worked down under the hydraulic press to a square section—the exact dimension depending upon the caliber of gun being forged. The 37-millimeter, for instance, requires a 6-inch square, the 75-millimeter calls for an 8-inch square and so on, a 500-ton press being used for these calibers and a 1500-ton unit for larger sizes. At this stage the press is preferred to the hammer in order to work the material deeply and thus secure maximum beneficial effects from hot working the steel. Later on in the process, the hammer will serve for calibers of 75-millimeter and under, but for the larger sizes the press is still preferred. Fig. 5 shows the 1500-ton press at work squaring off. At this point about 30 per cent is removed from the top of the square billet and some 5 or 10 per cent from the bottom, a cutter

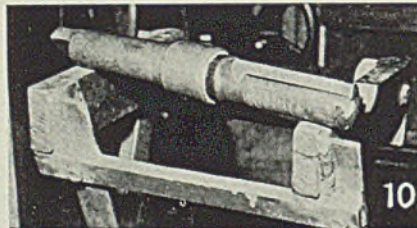
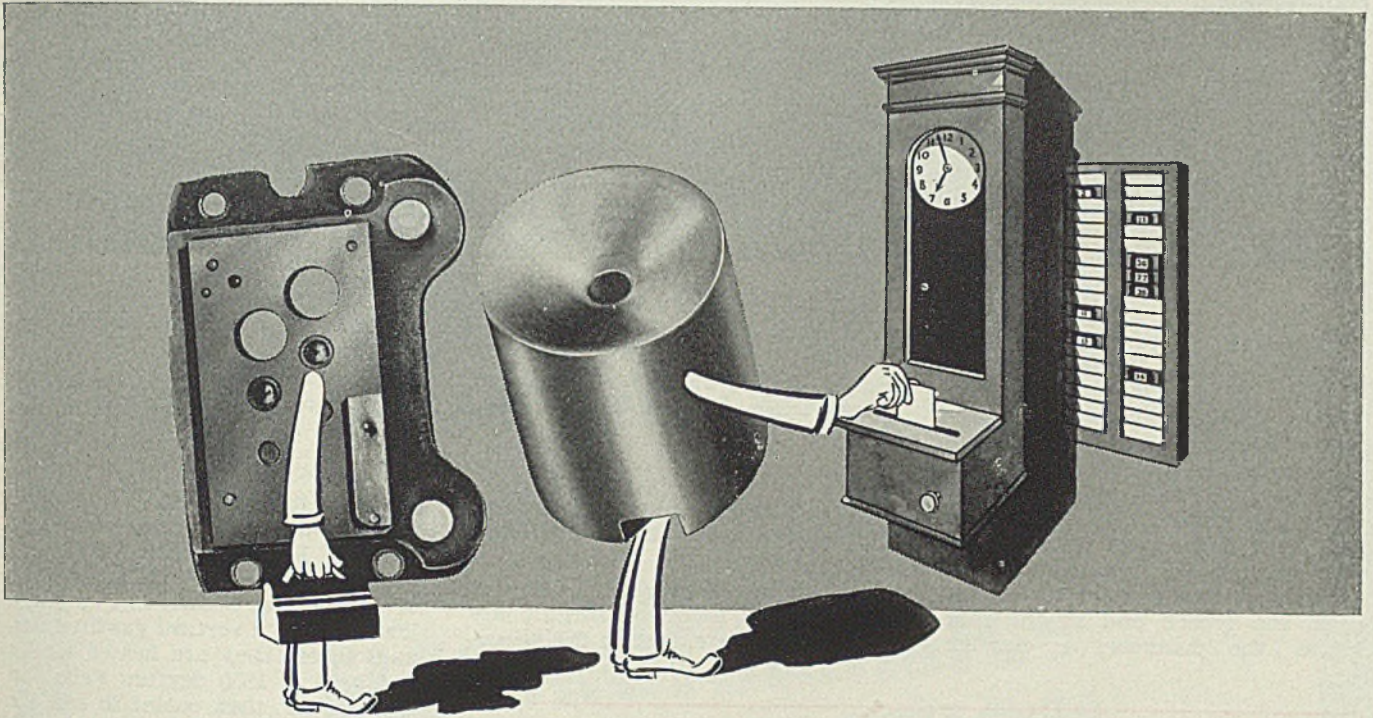


Fig. 10—Closeup of core drill used to secure a longitudinal test specimen from the muzzle of the gun forging

Fig. 11—This shows how a transverse saw cut is made on the breech end of the gun forging in order to obtain a transverse test specimen





TOOLS SHOULD PUNCH THE TIME CLOCK, TOO!

If your tools had to punch out every time they were responsible for stopping machine output . . . you might be startled by their short working time. Right now, when every man and machine is being pushed to the limit of productive capacity, is the time to make sure machines and presses are getting the proper cooperation from tools and dies. Now is the time to *make tools work more hours with fewer interruptions.*

That's where users of Carpenter *Matched* Tool Steels have a definite advantage. They get more output because their tools work longer with fewer stops for regrinding, repairing and replacing. And at the same time they conserve valuable metals.

For the purpose of helping customers get the most out of tool steels, we have prepared a handy **MATCHED TOOL STEEL MANUAL**. This new Carpenter manual is complete . . . from a **MATCHED TOOL STEEL CHART** showing how to solve tool making problems the **MATCHED SET** way . . . to detailed heat treating and drawing instructions. Added to this manual is an 81-page alphabetical *Tool Index and Steel Selector*. It quickly shows which steel best meets the requirements of each tool room job. If you do not already have a copy of this helpful 168-page manual, ask your Carpenter representative. He has one for you.

THIS TOOL PROBLEM WAS SOLVED THE MATCHED SET WAY!



The Job:

Piercing die used in piercing slots in 14 gauge hot rolled steel at a production rate of 1,200 pieces per hour.

The Problem:

Breakage occurred on narrow side of die after about 2,500 pieces. Heat treatment and hardness tests showed okay.

The Matched Set Solution:

Recognizing the need for a tougher oil-hardening steel to withstand piercing impacts, the Superintendent, guided by the **MATCHED SET** diagram, selected Carpenter **R.D.S. RESULTS**: 1. Breakage overcome. 2. Tool life increased from 2,500 to 1,000,000 pieces. 3. Production per month increased 39,400 pieces, by a saving of 33 hours in tool-caused idle press time.

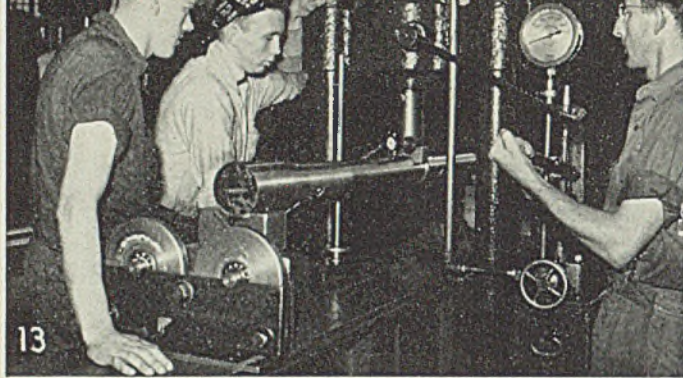


● The Carpenter **MATCHED TOOL STEEL MANUAL**, showing sample pages from the *Tool Index and Steel Selector*.

Carpenter
MATCHED
TOOL STEELS

THE CARPENTER STEEL COMPANY . . . READING, PA.

August 25, 1941



being pressed in from all four sides.

Fig. 6 shows the billet being worked down to form under the hammer after re-heating to 2100 degrees Fahr. or thereabout. During the operation the temperature is permitted to fall well down towards the upper limit of the critical range of the steel, or to around 1500 to 1600 degrees. Once more an identification number is stamped upon the breech end as the tube leaves the hammer, a number

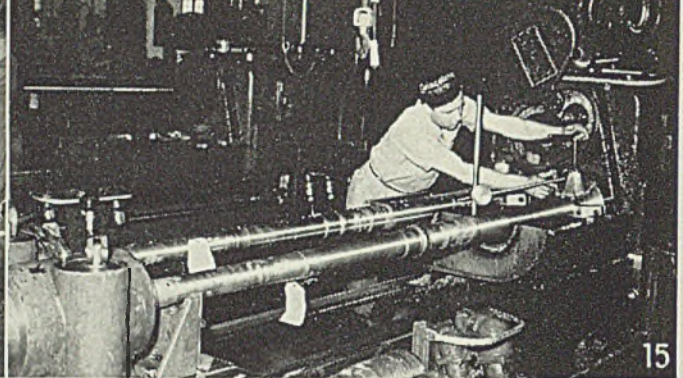


Fig. 13—Gun barrel is brought within the prescribed tolerance limits by carefully controlled "hits" with a hydraulically driven die in this mechanism

Fig. 15—Setting up for boring two gun forgings at the same time in a dual machine. Drilling is done first from one end, then the other. Tool will be diamond pointed drill shown in Fig. 14

where from seven to twelve days, depending on the size of the forging.

Although the reasons for this slow cooling following forging are still to a large extent in the specu-

checking of the steel.

Next, the gun forging is heat treated. First step is a double normalizing process in which a group of forgings as shown in Fig. 8 are lowered into a vertical gas-fired furnace where they are heated slowly and held at 1850 degrees Fahr. for eight hours, then cooled in still air to 500 degrees. At this temperature they are re-charged and heated to 1650 degrees, held at this level for six hours, then air cooled.

For the quench, the forgings are re-heated to 1550 degrees, held at this temperature for six hours, then lowered into the oil bath from which they are removed after the temperature has fallen below the flash point of the oil, or to around 300 degrees.

The quench is followed by a draw at 1050 to 1150 degrees Fahr., depending on the physical properties desired, the forgings being held at drawing temperature for ten hours. As may be well imagined, the careful heat treatment to which this gun steel is subjected, develops an exceptionally fine grained structure.

Under the microscope, using a magnification of 450 diameters, the polished and etched cross-section of a test piece exhibited apparently a troostite-sorbite complex, with rounded-off remaining needles of martensite. The presence of the special elements (chromium, nickel, molybdenum, vanadium, etc.) has a depressing effect on the A_{11} point, lowering this transformation temperature to about 800 degrees at moderate rates of cooling. Since checking or "hair line cracking" is known to occur between the A_{11} point and 300 degrees or so, every advantage is to be derived from the extremely slow cooling subsequent to forging.

This slow cooling permits the A_{11} transformation to take place at a higher temperature and thus at a time when the steel is in a softer condition. The changes in density accompanying the allotropic modifications of the critical range are thus removed as a contributory fac-

More Information on Modern Shell Production

STEEL's first reprint handbook on "Modern Shell Production" detailed the methods and equipment necessary for the most efficient production of high-explosive shell—that is, the shell body which undergoes fragmentation as it reaches its objective. Over 1000 copies of this 76-page book have now been distributed and a limited supply is still available at \$1.00 per copy.

Now, a second handbook has been compiled. It goes into further detail on the manufacture of shell, as well as brass cartridge cases, small arms ammunition, shell and bomb fuzes, the flight of the projectile and the airplane bomb. This second handbook is attractively bound, fully-illustrated and entitled "More Information on Modern Shell Production." Orders should be addressed to STEEL, Readers Service Department, Penton Building, Cleveland. Price, 50 cents per copy.

which is retained until shipment. Thereafter, the forging is immediately buried in a steel box containing fuller's earth. See Fig. 7. Mica, ashes, or the like would serve equally well for the purpose but fuller's earth happens to be readily available. Cooling down to about 150 degrees Fahr.—the temperature of removal from the box—takes any-

relative stage, the necessity for so treating the work has been amply demonstrated by experience. Possibly the relief of strains arising from forging work, or the harmless release of hydrogen dissolved in the steel, or both advantages arise from this extremely slow anneal. This much at least is certain, failure to observe this precaution results in

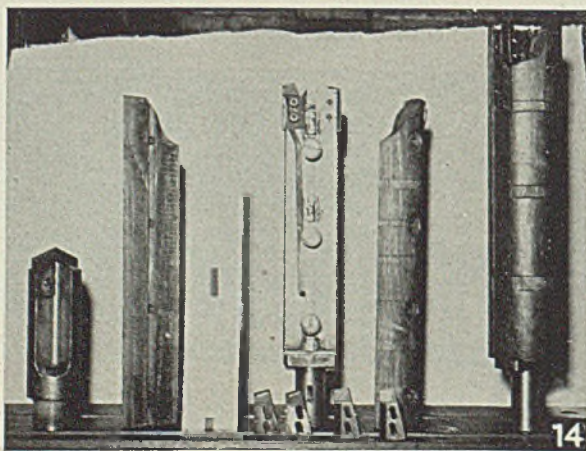


Fig. 14—Tools for boring and reaming gun forgings. The diamond pointed drill at extreme left drills the hole from the solid forging. The bit with the rock maple "packing" shown assembled at extreme right and disassembled in center is used to open up or "ream" the bore. This tool employs cutters of high speed steel, guided straight through the forging by the maple packing

HARDEN MOLY HIGH SPEED STEELS AS EASILY AS 18-4-1 with ELECTROTHERMIC- PERMEATION

HIGH-SPEED Tool Steels of half Molybdenum, half Tungsten or even *all* Moly are now being hardened with absolute certainty of uniform results. The Upton Electrothermic-Permeation principle of operation has made the changeover from 18-4-1 types surprisingly easy and there is very little experimenting to determine proper temperatures and time. Once determined, results can be duplicated with absolute certainty.

The Electrothermic-Permeation principle of operation assures a *positive*, yet natural, circulation of heated salt so strong that it supplies heat uniformly to all portions of the work. High operating efficiencies have saved upwards of \$1200.00 per year in fuel alone.

With its ultra-sensitive heat input control, the Upton high heat furnaces operate within minimum temperature fluctuations. Proof of this is that re-orders of Upton furnaces have increased sharply since users have begun hardening the MOLY types of high speed steels.

Let us tell you more about these furnaces now.

Users of Upton Electric Salt Bath Furnaces have found that:

- 1 There is no decarburization—even on ALL-MOLY alloys and size change of tools during hardening is under perfect control. This means that thousands of Moly hobs—hardened in Upton furnaces—are being sold without any grinding after hardening.
- 2 Properly hardened Moly H. S. Steel tools will give identical cutting characteristics with 18-4-1.
- 3 The ceramic pots last longer and the furnace costs considerably less to operate.

SEND FOR
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Our engineering department will gladly assist you in the selection of the correct heat treating equipment for any operation requiring from 300° to 2500° F.

UPTON ELECTRIC SALT BATH FURNACE DIV.
Commerce Pattern Foundry & Machine Company

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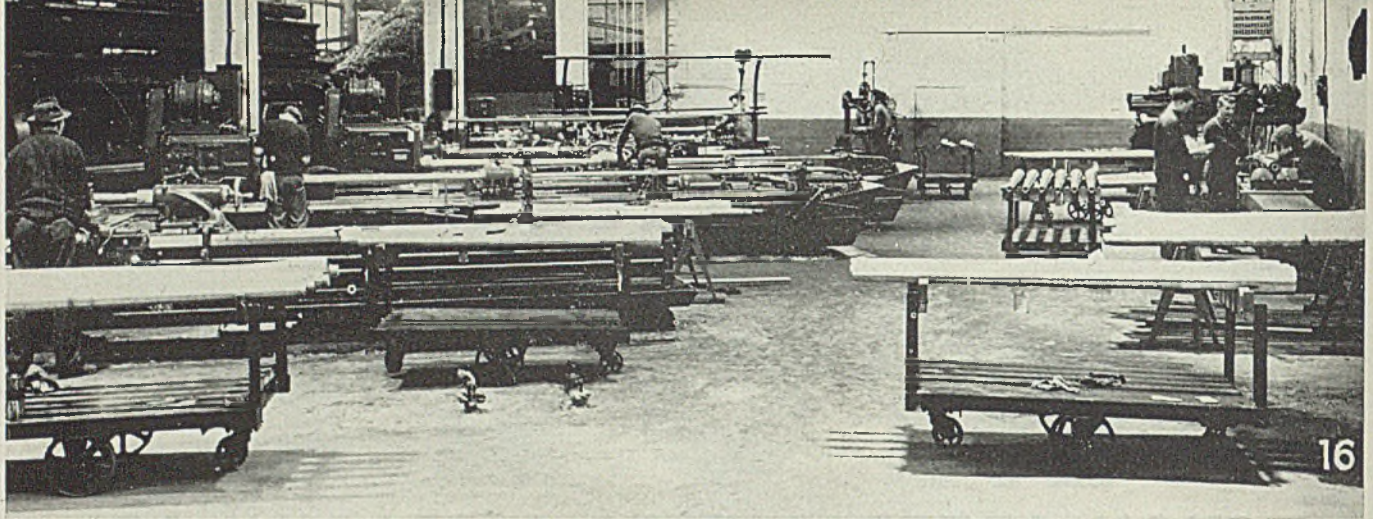


Fig. 16—One end of the machine shop where 37-millimeter gun forgings are being finished

tor in the checking which tends to occur during cooling after forging.

The necessity for hardening and drawing these gun forgings in order to secure the desired physical properties has the inevitable effect of distorting them. Thus a straightening operation carried out under a hydraulic press is undertaken at this point, the tubes being thereafter returned to the furnace where they are heated and held at a temperature 100 degrees less than the draw temperature. If this were not done, the tubes would bend once more after machining had removed the outer layer, the one chiefly affected by straightening.

The forgings are now ready for their preliminary physical tests. Fig. 10 shows the type of core drill employed to remove a test specimen in a longitudinal direction from the muzzle end of a 37-millimeter forging. Fig. 11 shows how a saw cut is taken on the breech end to secure a traverse test specimen.

Disks also are cut from both breech and muzzle ends for an etch test.

Longitudinal and transverse specimens are now turned down, the ends threaded and the central portion reduced to 0.37-inch diameter (an area of one square inch), gage length of 1.4 inches being employed. The locations from which test specimens are taken are marked by government inspectors, the usual point being about midway between the bore and the outside of the gun. For 37-millimeter tubes, the yield strength requirements lie between 95,000 and 120,000 pounds per square inch, with a minimum reduction of area of 45 per cent.

Characteristic analyses of two steels exhibiting these qualities are respectively: 0.34 and 0.36 per cent carbon; 0.68 and 0.62 per cent manganese; phosphorus, 0.017 each; sulphur, 0.024 and 0.021; silicon,

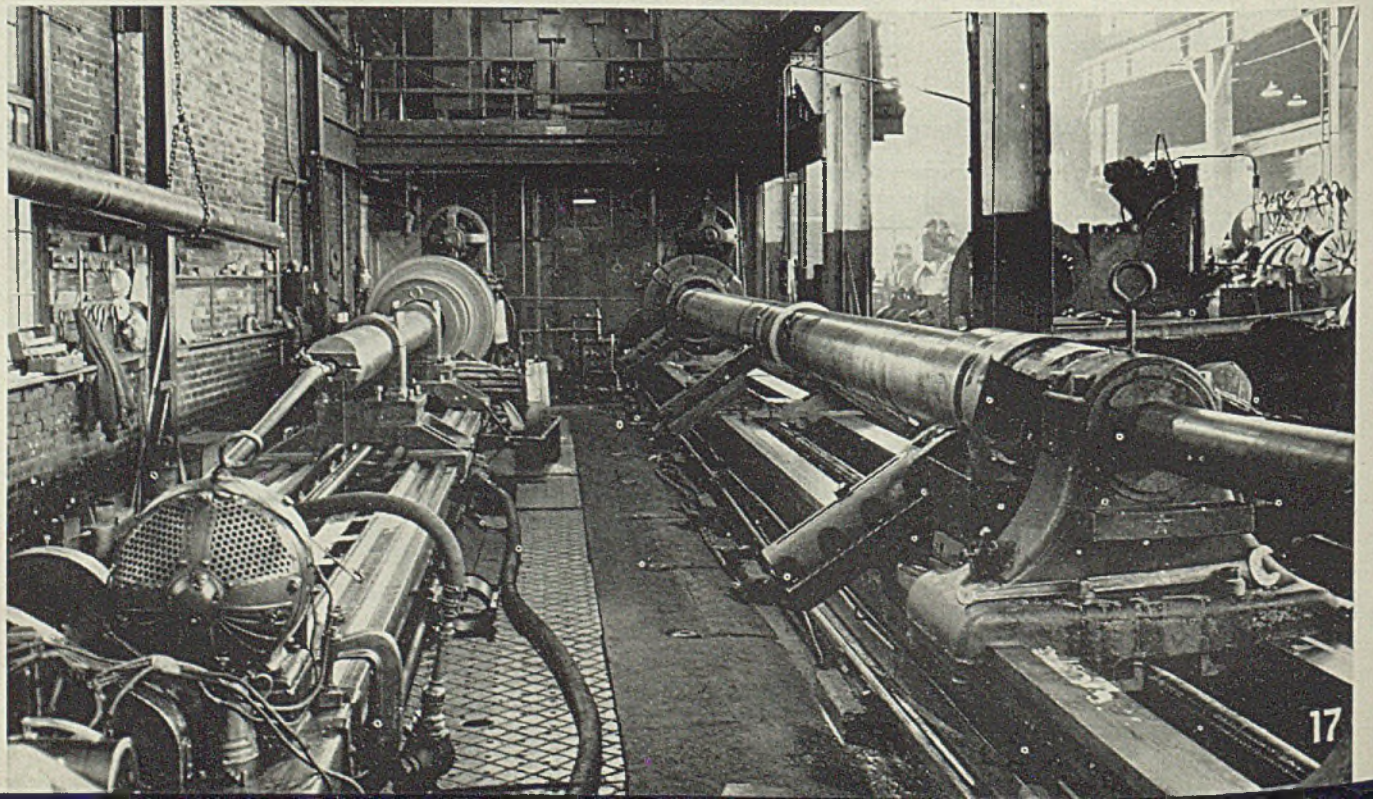
0.27 and 0.22; chromium, 0.94 and 1.04; nickel, zero and 2.37; molybdenum, 0.39 and 0.38; vanadium, 0.17 and zero.

For the purpose of determining yield strength the following procedure outlined in Federal Specification QQ-M-151a is followed. These specifications require that the extensometer used be capable of measuring strain within 0.00001-inch and lay down rather strict conditions under which instruments exhibiting lag and lost motion may be employed. Maximum rate at which load may be applied is 30,000 pounds per square inch per minute.

In order that the form of the stress-strain curve after the elastic limit has been passed may be determined accurately, extensometer readings are taken at zero load, then at 25 and 75 per cent of the prescribed yield strength. Then beginning at 90 per cent of the prescribed yield strength, extensometer readings for each 1000 pounds per

(Please turn to Page 82)

Fig. 17—Here is portion of shop working on the larger gun tubes. Note the three sets of heavy supports being employed on the gun barrel at the right. Part of the control equipment can be seen on the balcony at the far end



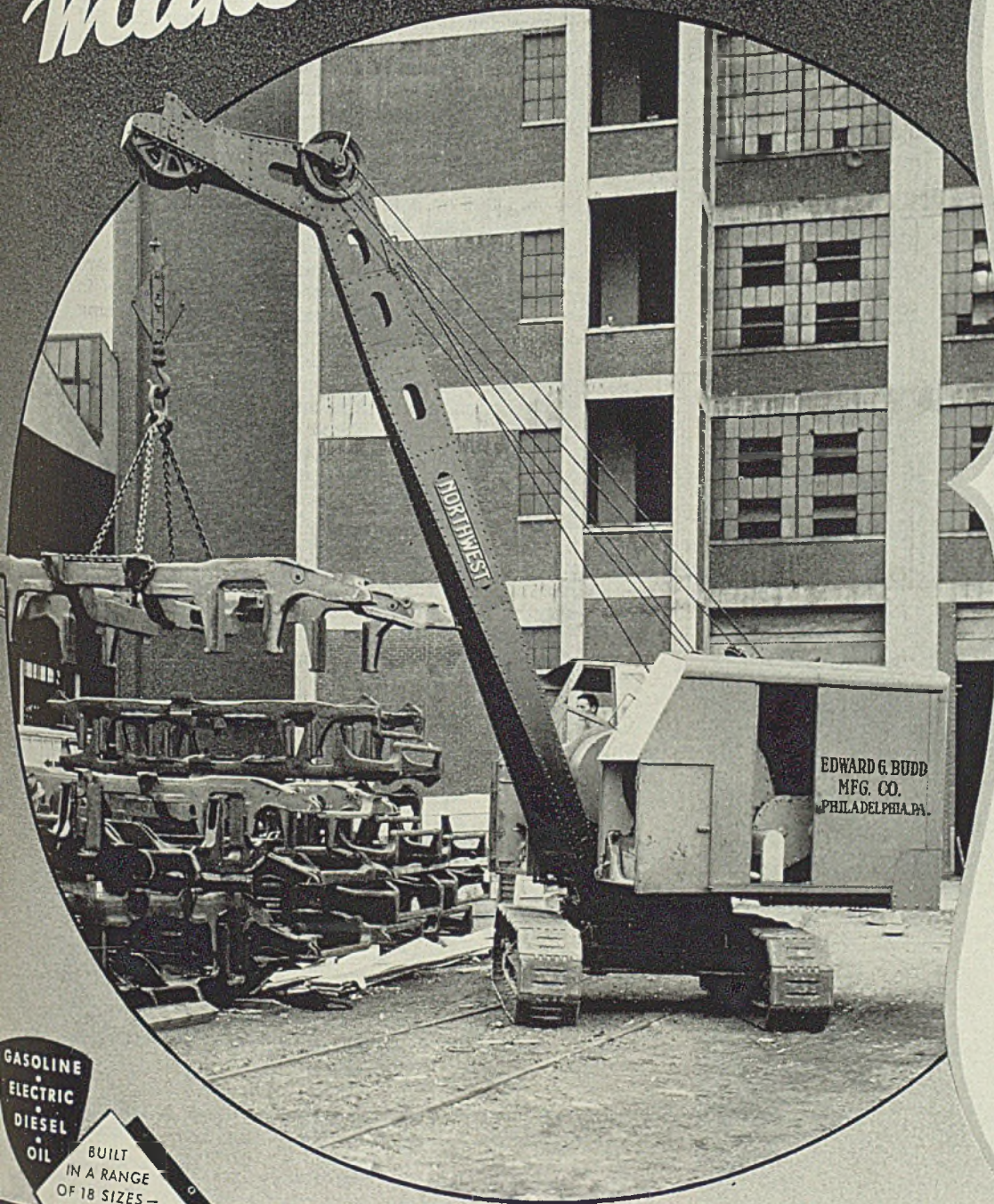
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THESE features can mean the difference between profit and loss to you. These Northwest advantages mean increased output and speed with lower maintenance costs. Many of them are found on no other machine and together they offer a combination that gets things done, and that's what counts today.

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THE
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 THAT GOES
 ANYWHERE

Materials Handling and FABRICATION

.... are co-ordinated to produce one truck cab every 7 minutes

■ **HANDCRAFTSMANSHIP** is combined with modern tools and the assembly line technique in production of steel cabs for trucks at the White Motor Co., 842 East Seventy-ninth street, Cleveland. Here materials handling methods are given equal consideration along with fabrication methods to the end that maximum production efficiency is attained.

To begin with, all parts are fabricated within the plant except large steel panels which are made outside with White-owned dies. Preliminary framing operations are handled on a large fixture which can be seen in Fig. 1. Here after the panels have been clamped in the massive jig, the abutting edges are arc welded to form a solid shell entirely free from rivets. There can be no shucking of joints or loosening of parts in such a unit. The completely welded cab shell is being removed from the fixture in Fig. 1. Except for these preliminary framing operations, accomplished on the fixture, all the fabricating operations are done at a series of stations along a floor-type chain conveyor line which has a variable speed of from 6 to 18 inches per minute. Cabs are spaced on this line about every 8 feet. Many types of craftsmen are required during the building process including spot welders, arc welders, gas welders, panelers, torch solderers, metal finishers, door hangers, painters, fit-out men and trimmers.

With the exception of the flooring, all panels are of 18-gage steel. At the first point of assembly, upper and lower back panels are combined by spot welding along the flanges and closed intervals. Two men work together, positioning the unit and operating the foot pedal of the resistance welder.

At the second station, the roof panel and windshield panels are combined by gas welding all the way across. This is done over a special form jig.

At the third assembly point, the completed roof and back panel unit are placed in the major assembly fixture shown in Fig. 1 and combined by electric arc welding, a welder and helper working together here. Next the cab shell is attached to the skeleton framework by arc welding, and the all-steel understructure is likewise added by arc welding. The understructure itself is made of 16-gage panels welded to $\frac{1}{8}$ -inch channel supports. The floor panel is a one-piece stamping, fully insulated underneath with $\frac{1}{2}$ -inch wool for protection of cab occupants against heat or cold.

After framing, the cab is placed on a dolly especially built to accommodate these units. As shown in Figs.

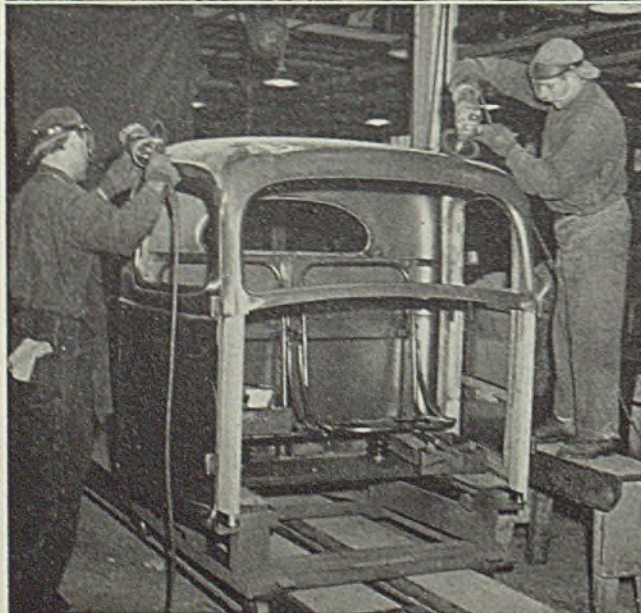
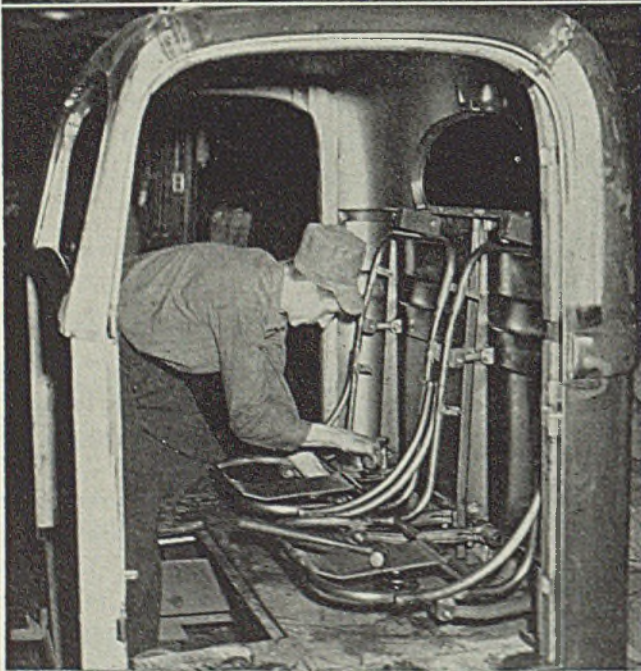
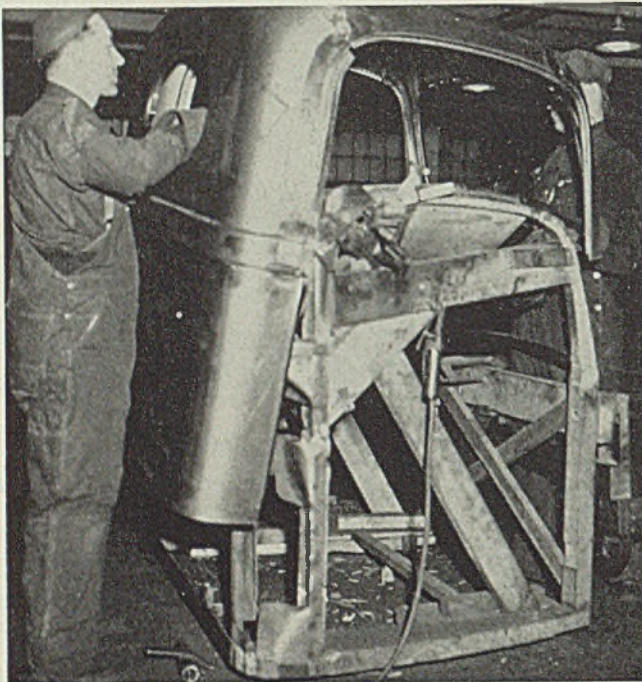


Fig. 1. (Top)—Major framing fixture in which most of the welding of panel sections and framework is done

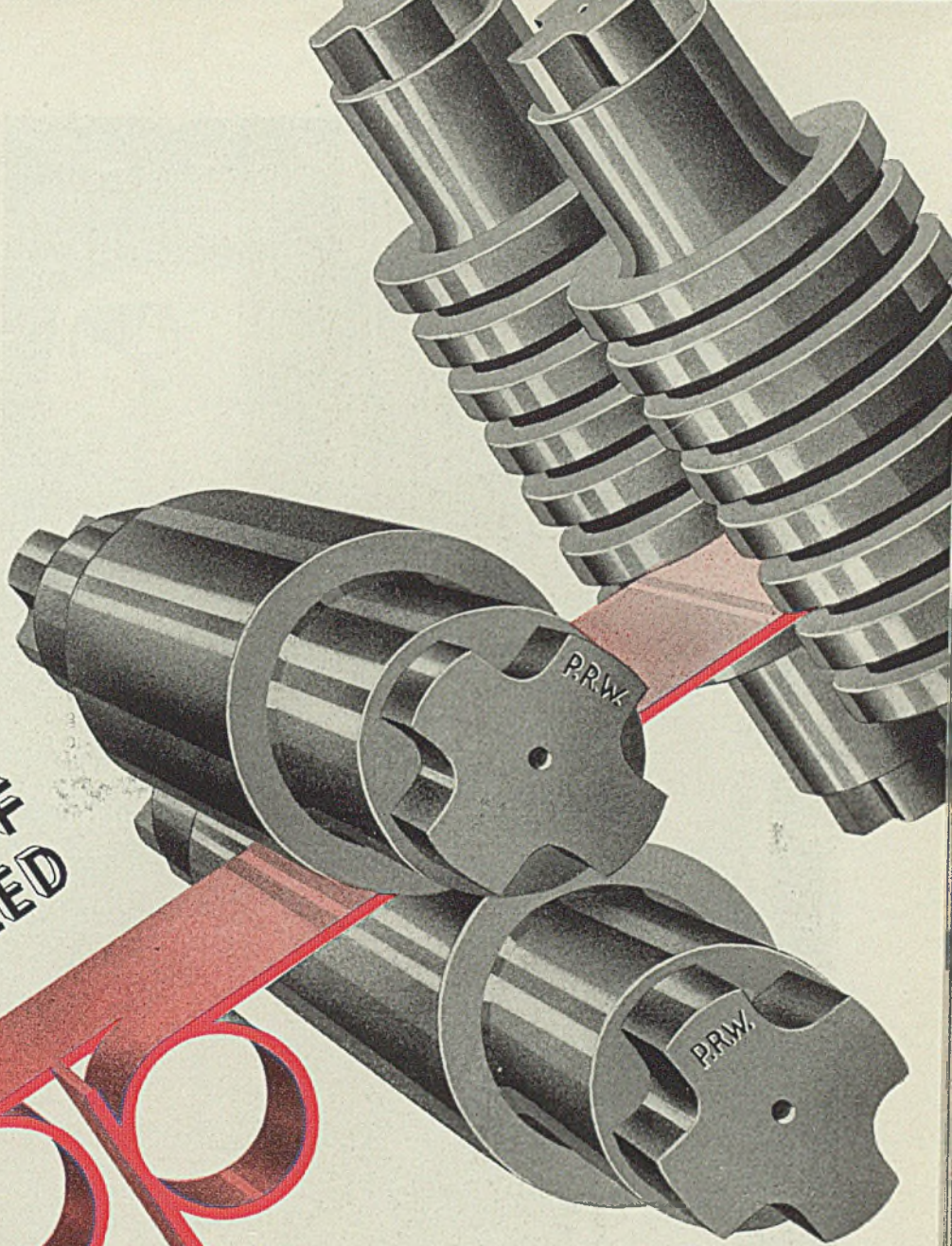
Fig. 2. (Center)—Here understructure frame and panels have been added and the operator is installing the seat frames. Note the heavy coil springs

Fig. 3. (Bottom)—Welds are ground off, filled with solder and then sanded smooth in preparation for painting. Power sanders help in this work

LESS COST
PER TON OF
STEEL ROLLED

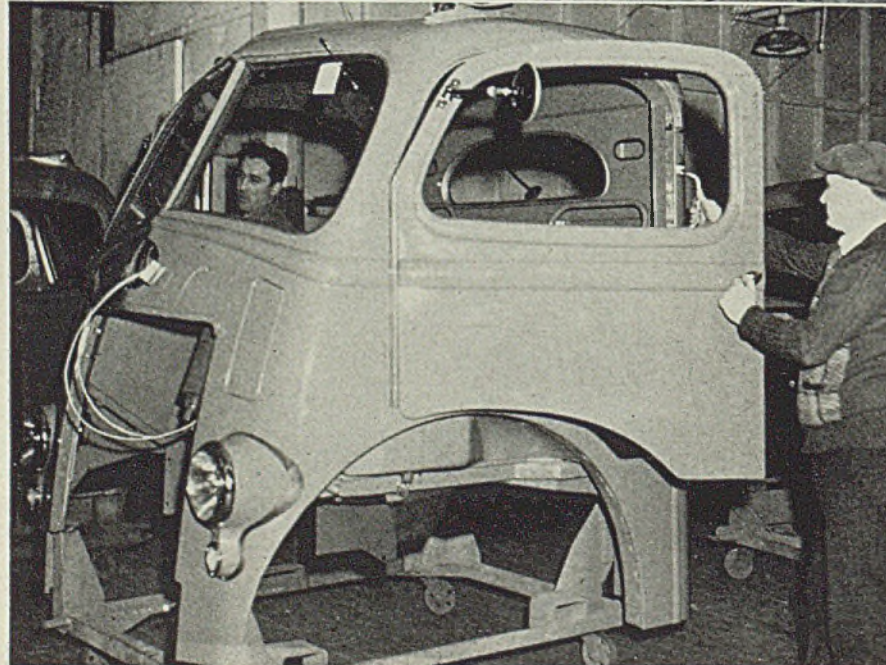
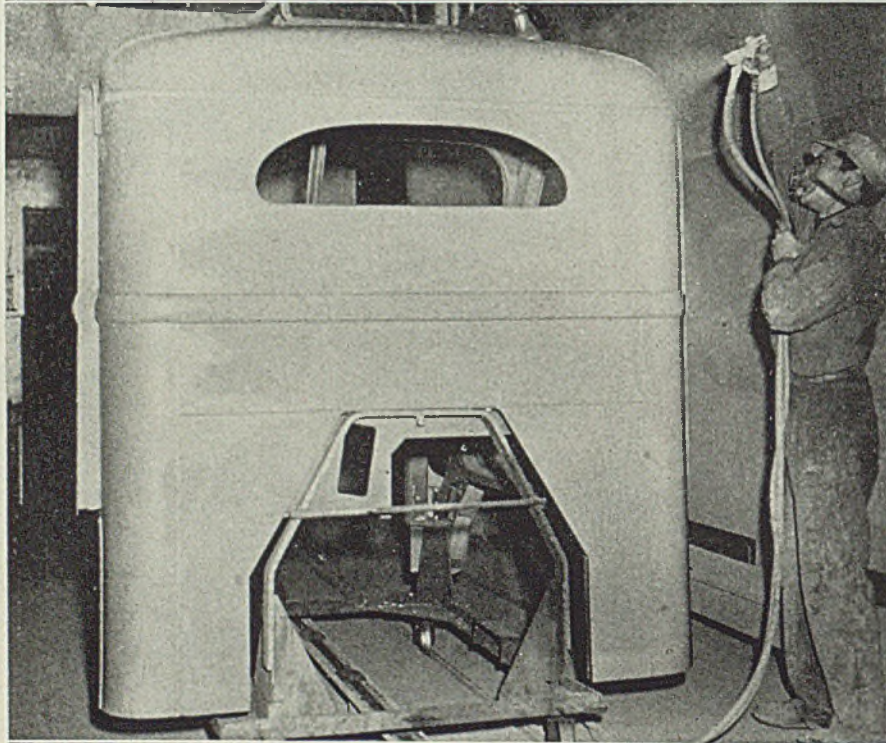
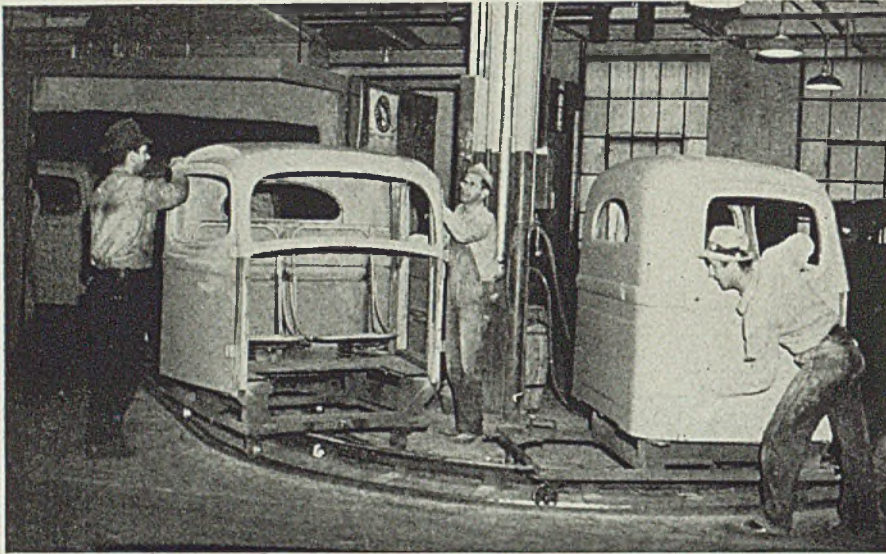
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2 and 3, this dolly can be moved about on the floor to any point desired and also can be rolled onto a channel or track for the production line operations, at which point it is hooked to the dolly in front, the line of dollies then being pulled down the production line.

In the conveyor line, the cabs are torch soldered to fill all seams, one man working on each side. The cabs are then completely finished using a sanding belt, disk wheel and hand sandpaper. No putty whatever is employed. The cabs are washed with acid and thinner, preparing the metal for subsequent painting operations and providing full assurance that no rust will eat through later.

Fig. 2 shows installation of seat frames constructed of tubular rail steel, centrally suspended above the cab floor on heavy alloy steel coil springs which eliminate the jar of rough road surfaces. The frames are given one coat of prime and one of enamel. Each frame is supported by two steel arms, known as "ride controls", attached to the rear cab supports and mounted on rubber bushings which act as shock absorbers to control and prevent excessive bouncing. The tension of these bushings can be regulated to meet the weight of each individual driver. Seat frames also are fastened to the cab uprights by shackles to hold the seat in a vertical position. This construction gives the entire seat assembly a cradle effect. To improve further the riding qualities, regular shock absorbers are installed.

Next the cab doors are hung, being tested to see that the door action is free. Subsequently, the cabs are thoroughly cleaned and sent to the prime spray booth for three successive coats of prime on the outside and one on the interior. Then the conveyor line takes them through an oven where they are baked for 50 minutes at 225 degrees Fahr.

When baked, cabs are sanded to a satin finish, using hand and power sanders as shown in Fig. 3. The conveyor line then makes a horse-shoe turn as shown in Fig. 4 to bring the cabs back through a finish spray booth where they are given

(Please turn to Page 78)

Fig. 4. (Top)—Here cabs are being sanded after the primer in preparation for entering the finish spray booth

Fig. 5. (Center)—Spraying on one of the three finish coats prior to finish baking

Fig. 6. (Bottom)—Complete cab with all fittings is being carefully inspected. More than 300 different combinations of cabs are produced on this line

VARIABLE SPEED DRIVES

increase production

■ WHILE variable-speed drives continue to show important advantages on more and more machines, there are still many applications on which they could be used to speed production, cut rejects, lower power costs or produce some other advantage.

Typical of what these units can do is the performance of the variable-speed transmission shown in Fig. 1. A continuous overhead chain conveyor 1800 feet long is

used for both assembly and inspection, covering many different departments of a plant. Its extreme length and loading necessitate two drives to keep maximum chain tension at a safe value.

Ordinary operating speed of the conveyor is 9 feet per minute, but a range from 4 to 12 feet per

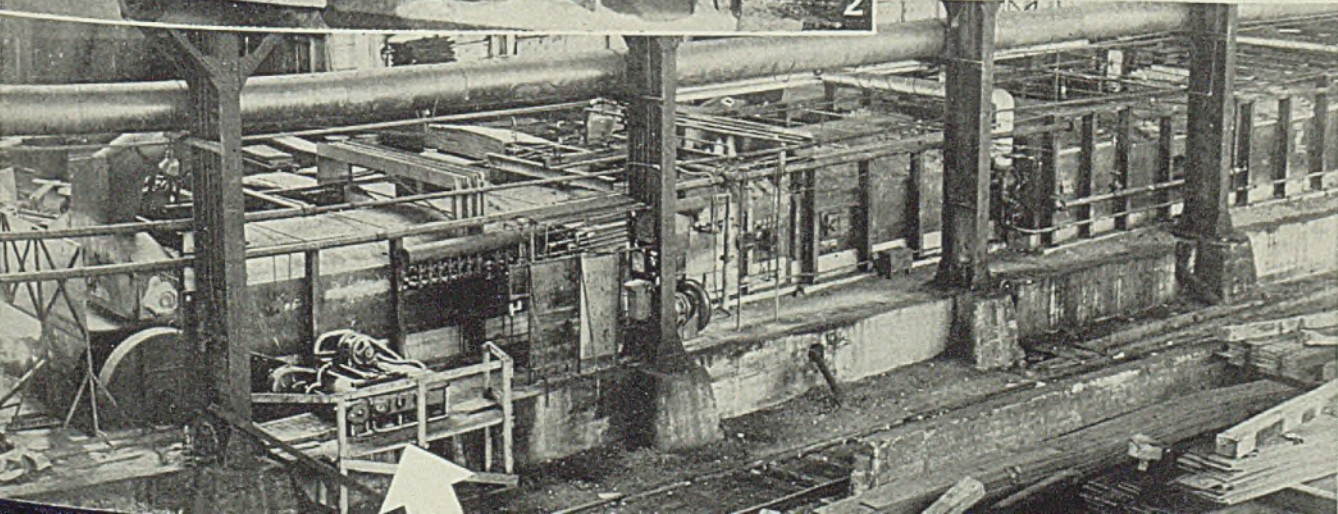
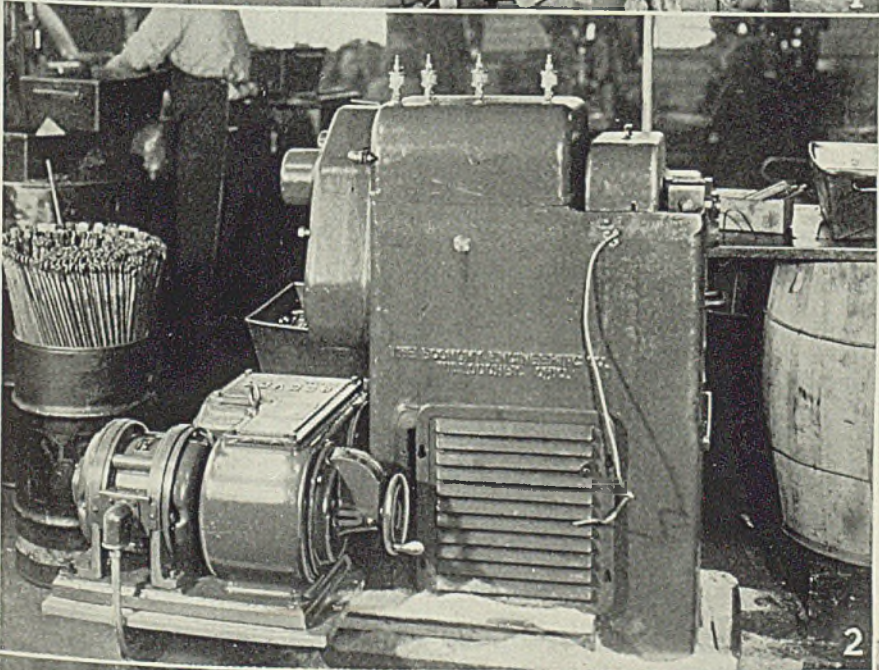
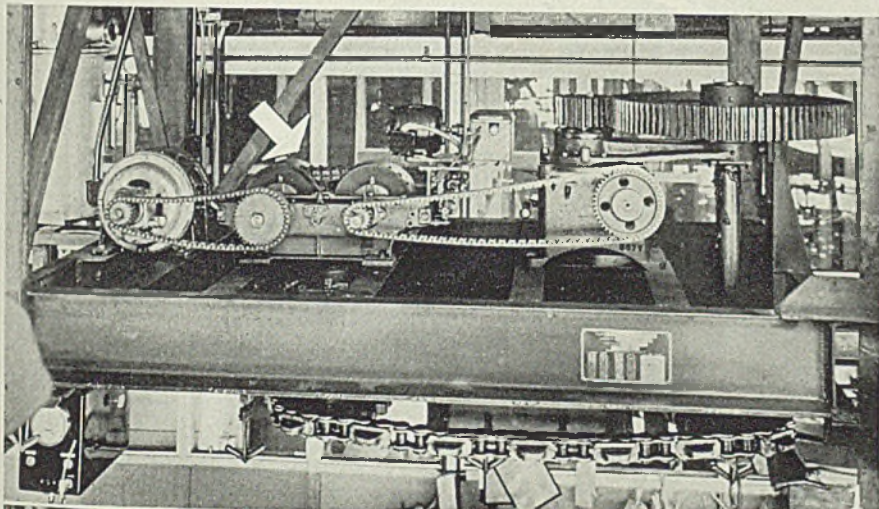
minute is provided. Any speed desired is set by manual hand wheel control of a horizontal open-design variable-speed transmission. Synchronization is accomplished automatically on the second drive, shown in Fig. 1. Floating-type counterweight takeups keep the chain at a constant tension. The hydraulic automatic control on the second drive is connected by cable to its floating takeup.

When the conveyor speed is reduced by the manually controlled transmission, slack chain accumulates in front of the hydraulically controlled drive, the counterweighted takeup absorbs this slack and moves on its guide, thereby actuating the hydraulic control which then automatically decreases the speed of that section of the conveyor, thus automatically synchronizing the drives. Not only two, but as many other drives as may be necessary can be controlled automatically by such a system.

Fig. 2 is a typical application of a variable speed motor drive to a machine. This unit points rods at Wolverine Bolt Co., Detroit. This installation increased production on the rod-pointing machine a full 20 per cent and an estimated \$1.50 per day is saved in operation of the machine.

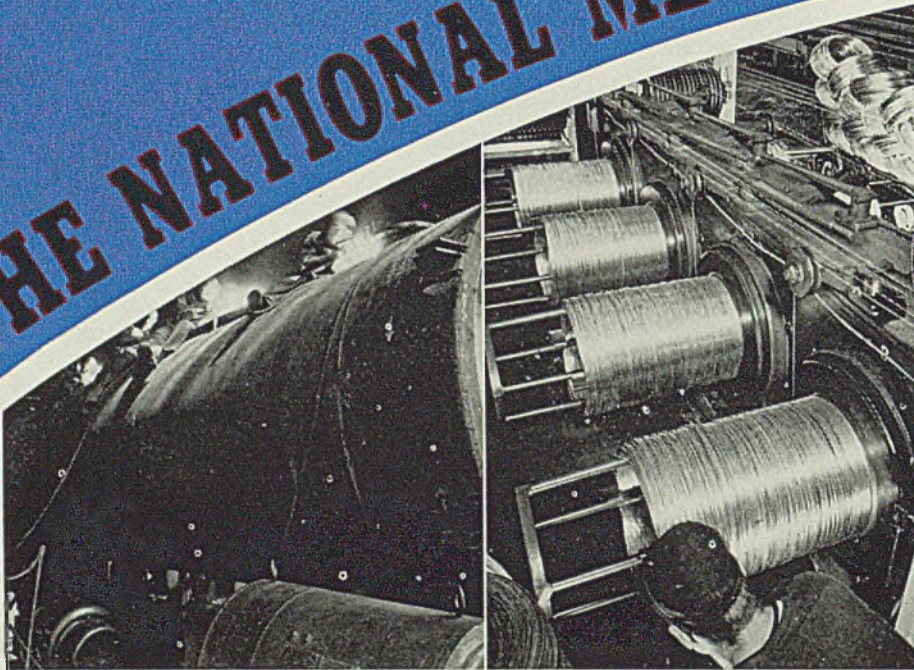
This application was important as it speeded up production on a machine which was a potential bottleneck in the production flow and so eliminated possibility of parts piling up at this point, with subsequent expensive rehandling. Also a better product results since the best possible speed for different sizes of rod now is instantly available to the operator.

A third type of application is shown in Fig. 3. Here a variable-speed transmission on a normalizing furnace gives exact heat-treating cycles desired. At Empire



STEEL'S METAL

THE NATIONAL METAL EXPOSITION



DEFENSE is the major problem of the metal producing and metalworking industries today. And, because of so many defense problems, the men working with metals are going to find it expedient and necessary to attend the twenty-third annual National Metal Congress and Exposition in Philadelphia's Public Auditorium, October 20-24. In no other way can such a fund of information be accumulated in so brief a time.

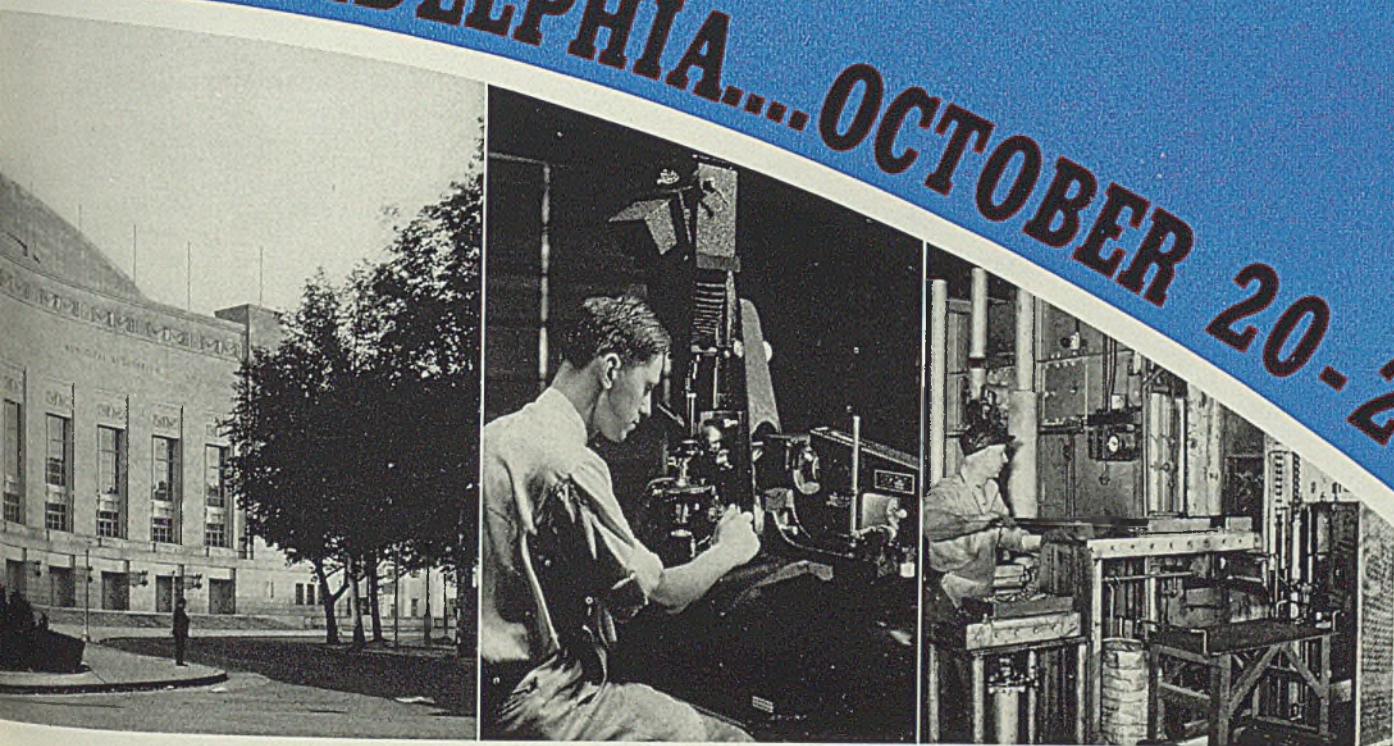
THE METAL SHOW this year will offer the opportunity for executives in defense industries to learn of new equipment, materials and processes with the least expenditure of time. The exhibits and the technical programs will offer many ideas and suggestions for speeding defense work. The 1941 Metal Show will undoubtedly attract many more than the 35,000 important visitors who attended the 1940 show. It will be very much worth while to make definite plans to attend this convention and exposition.

METAL SHOW ISSUE

OCTOBER 13, 1941

SHOW ISSUE... *Featuring*

.....PHILADELPHIA.....OCTOBER 20-24



STEEL as over the past many years, will devote a substantial portion of the October 13 issue to the same interests as the various Societies participating in the National Metal Congress. This issue will carry a combination editorial and advertising insert section printed in red and black on special coated stock. Editorially, it will carry the complete technical program; the entire list of exhibitors, who will be in attendance, their booth location and what they will exhibit; as well as other pertinent information.

ADVERTISING in this issue, in combination with the editorial material, will give the convention visitor a fore-taste of what he will see and hear—just a week prior to the opening of the show—and it will display your products to those who attend as well as those who do not. Companies selling to the metal producing and metalworking industries may well consider the advertising possibilities of this issue. Write for details.

STEEL

PENTON BUILDING CLEVELAND

Sheet & Tin Plate Co., Mansfield, O., it has been customary to use direct-current variable-speed motors on such furnaces, but there was only a limited amount of direct current available here. Furthermore, overhead cranes and other equipment on the direct-current line produced heavy voltage fluctuations and thus a wide variation in speed of all direct-current mo-

tors. This was undesirable here as it could produce considerable variation in sheet quality, due to variations in rolling speed.

Using a constant-speed alternating-current motor and a variable-speed drive, this unit not only saved the cost of running direct-current lines to the job but furthermore saved the conversion loss incident to use of a motor-gener-

ator set—a considerable saving since the unit runs 24 hours a day, 300 days a year. What is more important, its use assures absolutely uniform speed for all normalizing runs, eliminating danger of speed variations. Maintenance on brushes and direct-current motor controls also is saved. The variable-speed drives shown were furnished by Reeves Pulley Co., Columbus, Ind.

QUENCHING MEDIA

... for heat treating such items as alloy steel gun forgings

■ THESE notes are principally concerned with those factors which govern the selection of quenching oils. Primarily, of course, there is the necessity of securing the desired rate of cooling of the steel, but the degree of permanence in service and the extent of the availability of the medium are also important considerations. With regard to the question of cooling rate, it is well known that an increase in the speed of cooling from above the critical range results in a lowering of the A_1 point to such a level that the transformation of the austenite cannot proceed further than the martensitic stage. Thus we obtain a hardened steel.

However, it is perhaps less well known that the lowering of the temperature at which transformation takes place does not keep pace with the increase in the cooling rate, but falls abruptly at a certain "critical velocity" of quenching. Thus if the rate is sufficiently slow, the transformation of pearlite would occur in the neighborhood of the normal temperature of 1292 degrees Fahr.; while an increase in the cooling rate

By ARTHUR F. MACCONOCHIE

Head, Department of Mechanical Engineering

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University Station, Va.

And

Contributing Editor, STEEL

results in a lowering of the A_1 and the formation of sorbite rather than pearlite.

A further increase in the speed of cooling depresses the transformation point to around 1200 degrees, plain carbon steel now exhibiting a troostitic structure. Thereafter a very slight increase in the rate abruptly depresses the temperature of transformation and produces martensite. In any given case the rate of cooling would be influenced not only by the nature of the cooling medium and its amount, but also by the distance of the element from the heat robbing surface of the piece and the relative velocity of work and coolant.

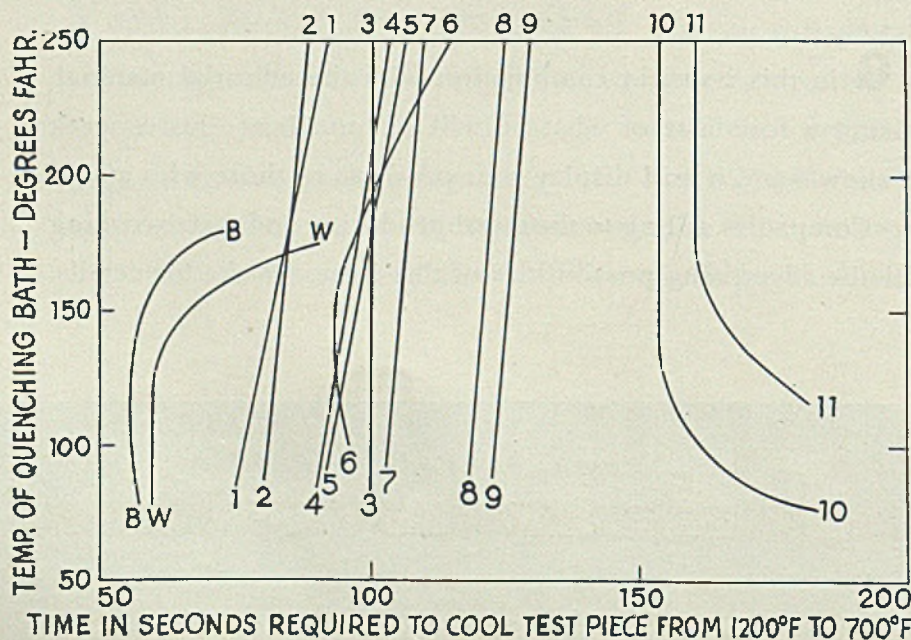
From of old a certain mystery has surrounded the art of the smith.

It may seem a far cry from the use of a Nubian slave for a sword, to the blind faith of a Sheffield craftsman in the virtue of water from some particular source. But the underlying cause is the same although its expression has fortunately assumed more humane forms. With the rapid increase in our knowledge of metallurgical science we have learned that the prime function of a quenching liquid (namely the withdrawal of heat) depends upon certain physical qualities which can readily be obtained among a wide variety of media at our disposal.

These qualities include the heat of vaporization; specific heat; conductivity; viscosity; volatility; initial temperature (to some extent); and last but by no means least important, the ratio between the quantity of the medium and the mass of the piece, since this last, together with the specific heat, determines the amount of heat which may be absorbed by the bath for a given rise in temperature.

Since much of the heat given out by the work is dissipated to distant parts of the bath by convection, high viscosity tends to slow down the rate of heat absorption by the bath. However, in liquids which boil at low or moderate temperatures, much of the heat may be absorbed in the latent form, giving rise to bubbles of vapor which, if allowed to adhere to the metal, retard cooling. Water, one of the most efficient quenching media from the standpoint of ability to absorb heat quickly, has both a high specific heat and a large latent heat. When these characteristics are coupled with low viscosity, we have a combination of properties conducive to maximum effectiveness.

(Please turn to Page 87)



This diagram illustrates approximately the quenching power of various liquids. Key: B, brine; W, city water; 1, new fish oil; 2, No. 2 lard oil; 3, lard oil in use for 2 years; 4, boiled linseed oil; 5, raw linseed oil; 6, new bleached fish oil; 7, new cottonseed oil; 8, tempering oil (60% cottonseed, 40% mineral); 9, mineral tempering oil; 10, dark mineral tempering oil; 11, extremely viscous tempering oil. From data by Mathews and Stagg

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11 SIMPLE WAYS TO GET BETTER SERVICE FROM PIPING EQUIPMENT



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 While this bulletin is written primarily for the guidance of maintenance workers, its purpose and its contents may be of interest to:

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- Dept. of Maintenance
- Maintenance Foreman
- Master Mechanic
- Foreman Pipe Fitter
- Store Keeper



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DEVELOPS FLOATING DRIVE

for

MILL RUNOUT TABLES

By JOHN D. KNOX
Steel Plant Editor

Rotor of newly developed motor is integral part of table roller. Lug on under-side of frame prevents rotation of stator under operating conditions. Starting of motor is cushioned by coil springs. Wobble of table roller due to warpage has no harmful effects on motor

IN EARLY DESIGNS of steel mill runout tables a large number of the rollers were driven through a common lineshaft and bevel gears by a single motor. This type drive had many disadvantages. When the motor failed for any reason the mill stopped rolling. Then there was the problem of lubrication, warpage of the table rollers due to heat radiated from the hot steel in transit, wear of gear teeth and mis-alignment of shaft and gears. This arrangement of driving mill tables, therefore, was gradually abandoned.

A few decades ago separate induction motors were employed for actuating a short curved conveyor table for moving billets from the heating furnace to the first stand of rolls. The table rollers were driven through a pinion and an internal spur gear with all motors controlled through a single starter. This represented the first step. The next stage in the development made use of individual gearmotors, and this was followed by direct drives, using individual motors. Individual drives for steel mill runout table rollers have since been widely employed on many of the modern mills, particularly for rolling wide strip and sheets.

Recently, however, a new type of drive for mill table rollers, known as the "floating motor drive," has been developed by the Reliance Electric & Engineering Co., 1038 Ivanhoe Road, Cleveland. A floating motor is mounted on the end of the roller shaft in such a way that it is always concentric with the shaft. The relation of the armature to the field poles, or rotor to the stator is always the same. Variable weights of steel commodities coming from the mill and any warpage of the table roller whether caused by radiat-

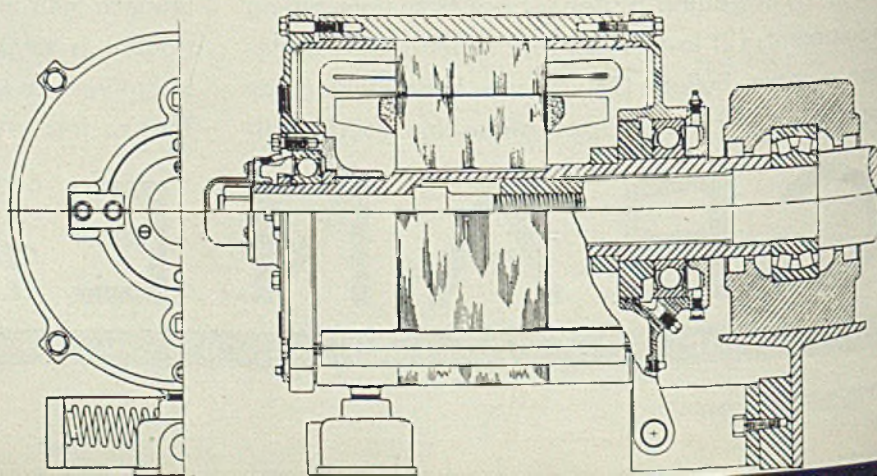
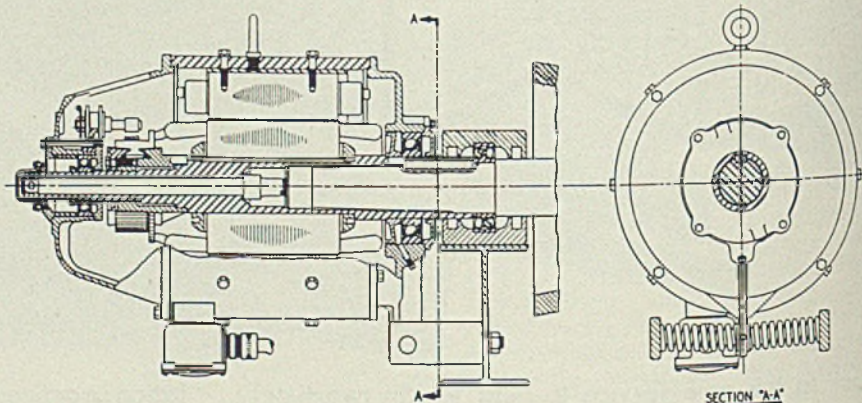
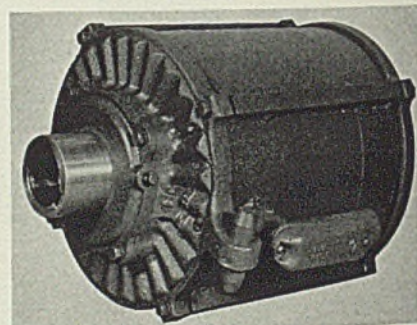
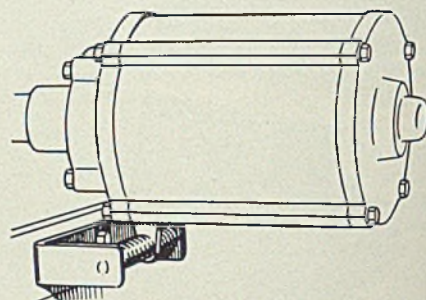
ed heat or battering, have little effect on the maintenance of the centerline of the roller with respect to the motor, inasmuch as they are identical.

The motor rotor is mounted on a sleeve, which in turn is keyed to the shaft of the table roller. Both the rotor and roller shaft are carried on the same set of ball bearings.

The roller shaft extension is drilled

(Above) Coil springs positioned on each side of the lug on bottom of motor frame prevent rotation of field frame and cushion the starting of the motor

(Right) Floating motor showing roller shaft extension. Coil springs, which compensate for the torque developed by the motor, fit over the pins shown at bottom of frame



(Above) Layout of the floating drive applied to a direct-current motor

(Right) Layout of the floating drive applied to an alternating-current drive

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In spite of the acute emergency conditions prevailing throughout your industry, *your part in the defense program need not conflict with your profits!* Right now, thousands of manufacturers are accepting the challenge by finding new ways to hold their manufacturing costs to a minimum, thus defending their profits. In wire working, for instance, these manufacturers more than ever before are effecting genuine savings by selecting a wire known beyond question for its quality, uniformity, workability. Such a wire is WISSCO UNIFORM'D* WIRE. You, too, can benefit from the use of a wire that works well . . . a wire that's easy on tools and machine and promotes top speed operation *with safety.* Next time you order Wire, combine your patriotic urge with your profit urge by specifying WISSCO!

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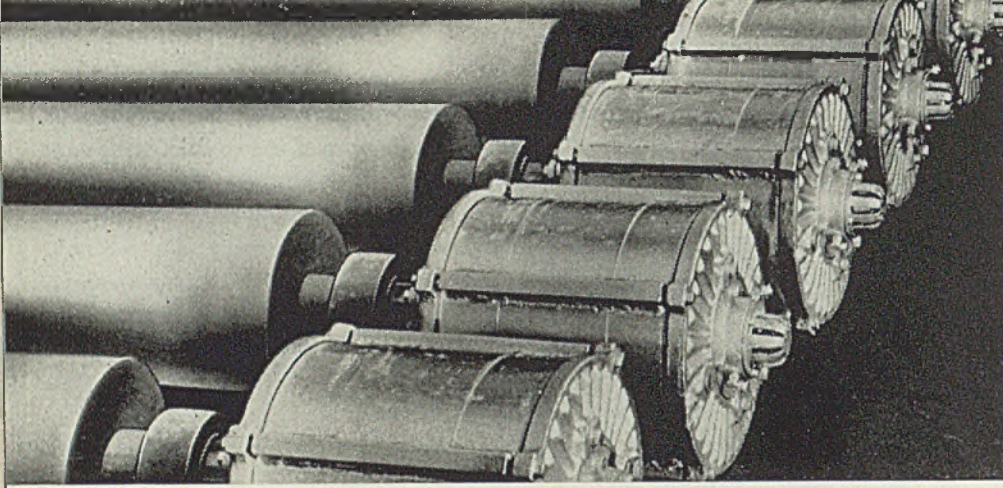
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WISSCO WIRE

BY WICKWIRE SPENCER



Typical application of the newly developed drive to a series of runout table rollers

and threaded to receive a screw. The unthreaded shank of this screw passes through, and is supported by, the rotor sleeve. Endwise motion of the screw with relation to the rotor sleeve is prevented by a shoulder on one side and a welded head on the other.

A rotor ready for mounting is drawn onto the table roller shaft by turning the threaded stud into the internal threaded portion of the roller shaft, thus forcing the sleeve of the rotor over the roller shaft.

Attached to the underside of the motor at the rear end is a lug with a pin on each side, coil springs designed to compensate for the torque developed by the motor fit over these pins and extend in the opposite direction to a U-shaped bracket bolted to the roller table bed. The springs confine the rotation of the stator to about an inch from neutral position, depending upon their stiffness, and through their reaction compel the rotation of the rotor and table roller. In addition, the springs serve to cushion the starting of the motor. When the motor first starts to operate, there is a noticeable deflection of both springs, but as the motor is brought up to speed, all deflection disappears.

The question arose concerning the operation of the motor in case the table roller became sufficiently

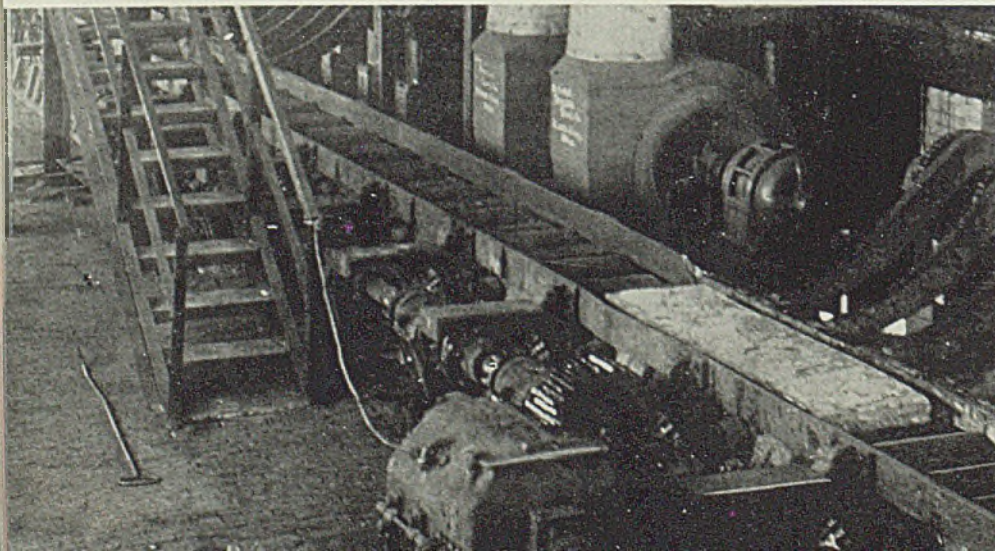
warped to throw the motor out of line. And so the Reliance Co. undertook two tests in its laboratory. First, a table roller was displaced 30 degrees from the horizontal; this had no effect on the operation of the motor. Second, a table roller shaft was bent to throw the outer end of the motor 1/16-inch out of line with the bearings of the roller; neither the wobble nor the vibration was harmful. Since these experiments the company has had table rollers operating successfully in mill service for over two years.

Connection with the power supply is had through flexible covered wire leads which are resistant to moisture and oil. A special plug and floor receptacle are used to facilitate a break in the circuit.

Either alternating-current or direct-current motors are used for the floating drive, depending on economic conditions. In roller table operation, adjustable speed of the roller is essential to match the speed of the material delivered by the mill, and this is made possible either by the use of alternating-current motors and variable frequency, or direct-current motors operating on variable voltage. Each type motor has its own advantages.

While the cost of a standard motor is less than that of a floating drive motor with its sleeve and

Typical roller table of two decades ago with a large group of rollers driven by a single motor through line shaft and bevel gearing



drawing-on stud, there are advantages to be secured. No couplings or mountings are necessary. The table roller and motor may be replaced as a unit. Mis-alignment of the motor and roller never is encountered. Table construction is simplified and cost materially reduced.

Films Show Optical Tests, Thread Grinding

■ Both inspection by optical projection and automatic thread grinding are comparatively recent but extremely important developments about which little textual matter exists. However, these techniques are playing such an important role in the manufacture of defense products requiring great accuracy and quality of finish that students of modern inspection and thread production should learn them.

To provide technical training schools and other institutions with material for instruction in these modern methods of inspection and thread production, Jones & Lamson Machine Co., Springfield, Vt., has prepared two slide films illustrating optical comparators and automatic thread grinders. Each film is accompanied by a written description in lecture form.

The films can be projected with any standard 35 m/m slide film projector and either or both will be sent gratis to any university, technical school, or other accredited institution providing technical courses, upon request of the principal in charge.

Silver Shows Promise as Electroplated Coating

■ The field of electroplated coatings continues to show promise as an outlet for silver according to the American Silver Producers' Research Project, upon completion of a year of activity at the Bridgeport, Conn., plant of Handy & Harman.

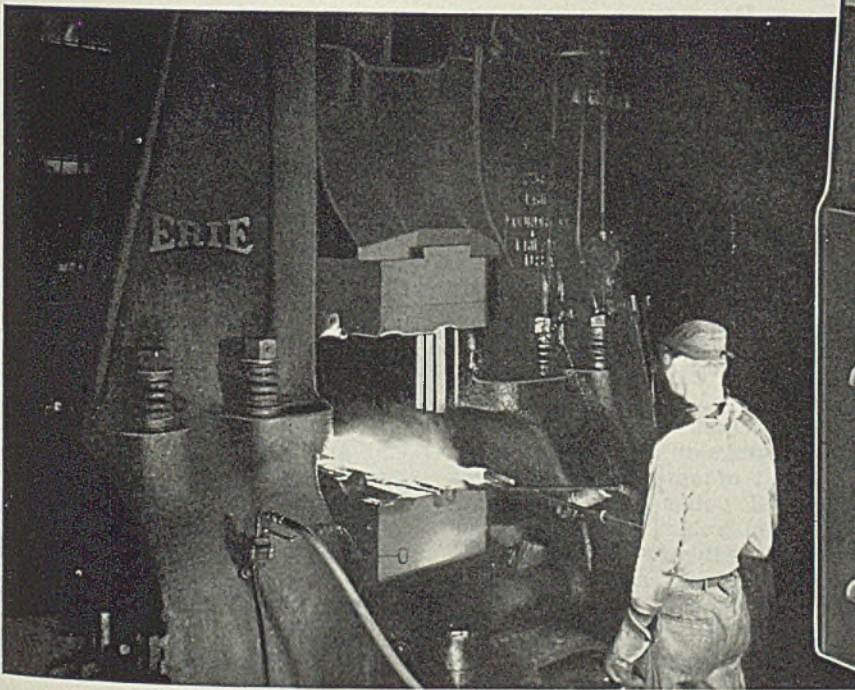
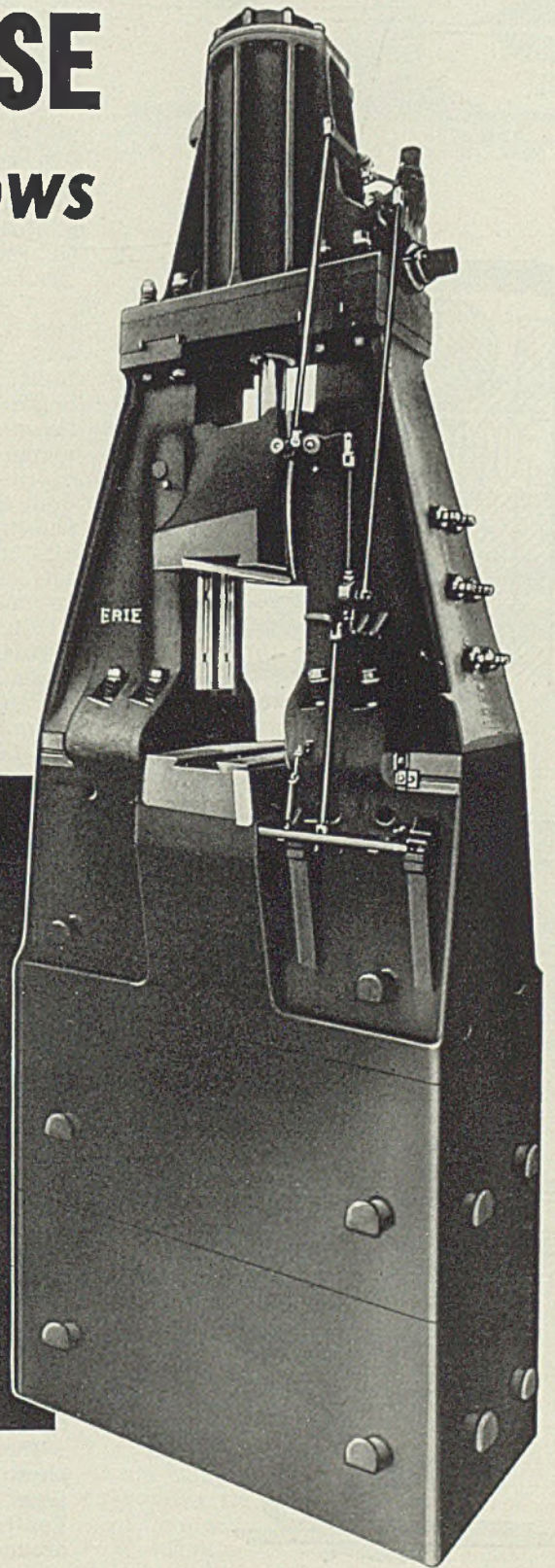
Silver-plated containers, according to the report, now are undergoing experimental stages as a package for chemicals and commodities. So far, however, results have varied. In recent months the scarcity of many base metals has focused attention on the use of silver as a substitute for aluminum, nickel and tin. Experiments also are under way to determine advantages of the use of a corrosion-resistant electroplate of silver followed by a hard, wear-resistant chromium deposit.

In conducting experiments to determine the strength of extruded tubing made from a 3.5 per cent silver to 96.5 per cent tin alloy, a bursting strength of 2500 pounds per square inch was obtained.

SPEEDING DEFENSE

with 98,000,000 lb. blows

Conservative calculations show that the instantaneous force developed at the moment of impact by a 35,000 pound Erie Steam Hammer is over 98 million pounds. Not only are Erie Hammers built with extra ruggedness to withstand the heavy resultant stresses, but they are so designed that every pound of the force is put to work on the metal being forged. These are the two main reasons why Erie Hammers are speeding defense by standing up under abnormally heavy operating schedules.

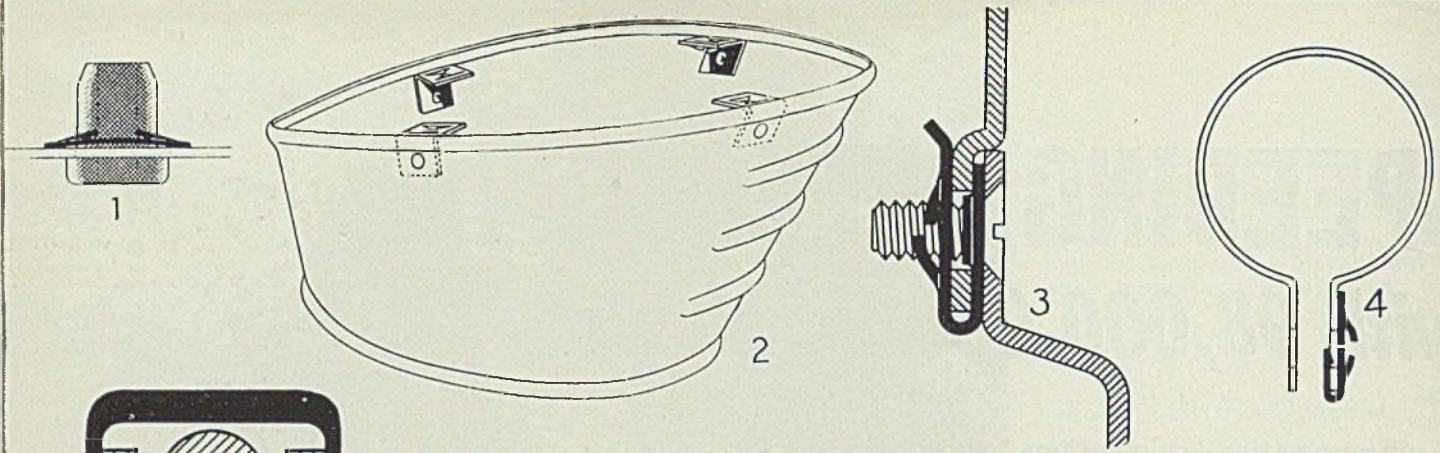


Erie Steam Hammers are made in rated sizes up to 75,000 pounds. They are fully described in Bulletin 333. Write for your copy.

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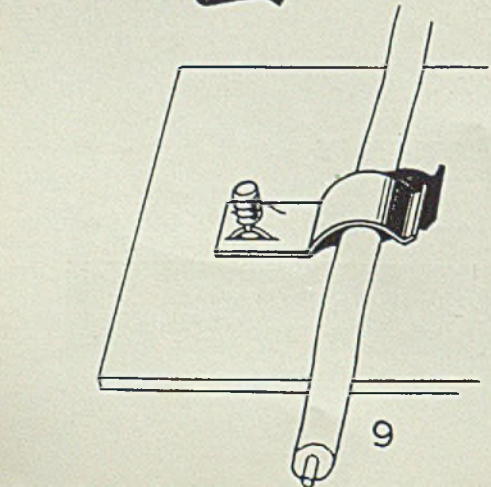
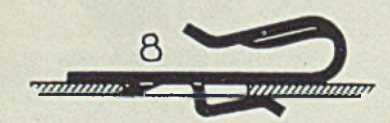
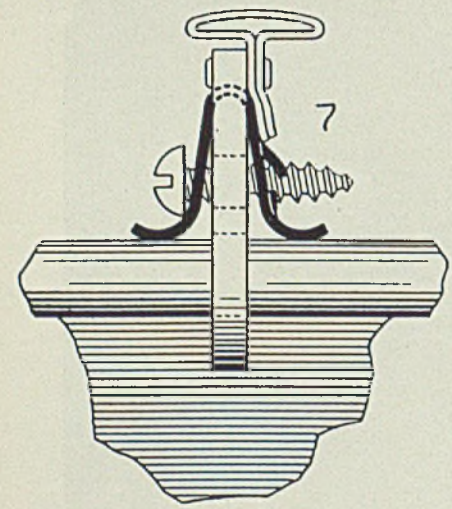
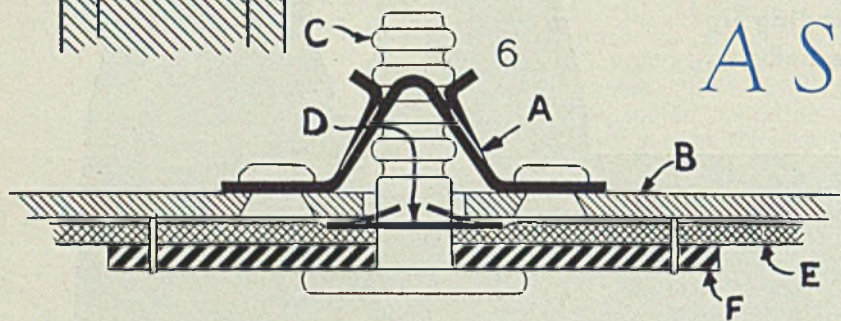
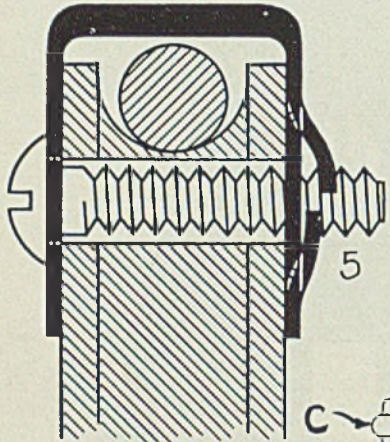
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ERIE BUILDS Dependable HAMMERS



**Cutting Cost
And Weight of**

**AIRCRAFT
ASSEMBLIES**



■ ONE OF the most important ways to reduce cost, weight and time in making aircraft assemblies lies in the use of Speed nuts and Speed clips—fastening devices which afford savings up to 70 per cent in cost of material and reductions in weight up to 90 per cent. When savings in cost of handling and speed of assembly are added, the actual dollar saving may be doubled or trebled in many cases. Add to this the fact that the efficiency of these fastenings (as regard resistance to loosening from vibration) has been found as much as four times as great as that of conventional fastening devices.

There are many aircraft assemblies for which the standard flat type Speed nut is well adapted. For example, rubber sealing strips around access doors, bomb bay enclosures, chemical tank fairings, etc., may be fastened by using a retainer strip over the fastening leg of the sealing strip with a Speed nut holding down the retainer strip. Standard flat Speed nuts in the form of continuous strips afford tremendous savings in weight, cost and assembly time for building up fire wall sections, stiffening ribs, etc. When the prongs are evenly spaced, Speed nut strips can be furnished in coils and cut off to desired length.

One of the quickest methods of

greatly reducing cost and weight is to employ the Speed nut shown in Fig. 1 to attach fairlead blocks. Every aircraft has a large number of control cables which must run through various portions of the structure. To form a guide for the cables and to prevent fraying, a special fiber grommet could be made and fastened with one push-on type Speed nut as shown in Fig. 1.

Fig. 2 shows how angle-type anchor Speed nuts can be employed on exhaust fairing to eliminate special angles and brackets, thus reducing total weight and number of parts and increasing speed of assembly.

U and J-Speed nuts, Figs. 3 and 4 respectively, are used on an exceptionally wide range of applications since both of these types are self-locating and thus are suitable for "blind" locations. To apply them, it is necessary merely to snap the nut over the edge or flange of the part to be fastened.

Fig. 3, for instance, shows method of using a U-type Speed nut to install streamlined fairings, exhaust scoops, intake scoops, etc. Note the smooth outer surface provided at the right. The same method is used in fastening engine and other cowlings and for attaching canvas boots or wheel pockets, belly cowl-ing panels, mounting tab control indicator plates, spinner mountings, crankcase deflector assemblies and flush-mounted inspection plates. Also they are used for attaching hub fairings to landing wheel brakes, navigation and cabin lights,

instrument panels and many other points on the plane.

In Fig. 4, a J-type Speed nut is being used with a cable clamp. The J-type differs from the U-type in that the inside leg is shorter. It is used where the full bearing of the lower leg is not needed, yet it affords the same advantage of being self-positioning as well as providing economy in use of material.

In addition to standard flat, U and J-Speed nuts, many specials have been employed to advantage. For instance, Fig. 5 shows a special U-type Speed nut to provide a one-piece cable guard for pulley sectors. Virtually every airplane has many locations where such cable guards are needed.

Fig. 6 shows another arrangement. Here a special Speed nut "A" is riveted to the structural section "B" with flush rivets on the outer face. Then for quick attachment or removal of wheel pockets a serrated stud "C" is secured to the canvas "E" by means of flat Speed nut "D". Stud "C" then is pushed in easily to tension the assembly securely. To remove pockets for inspection or service, a firm pull allows stud to be ratcheted out of the assembled position. The fiber reinforcement "F" prevents stud from pulling through the fabric.

Fig. 7 shows a special Speed nut that provides means for positioning wing ribs to I-beam type wing spars. With this type of assembly, there are no holes or notchings made in the spar, and therefore its full strength is retained. As screw is tightened, the ball-like fingers of the Speed nut clamp the wing rib bracket to the spar under spring-loaded tension.

In all of these applications the Speed nut replaces at least a nut and a lock washer and in many instances replaces several other parts as well. For example, in attaching cables, wires and tubes, the latching-type Speed clip shown in Fig. 8 can be snapped into sheet metal sections, with no screws, rivets or saddle strap being required. Similarly, the Speed nut in Fig. 9 eliminates several parts of former cable attachments. To cushion the tubing or conduit being carried, these devices are provided with a coating of Neoprene or rubber where desired.

Fig. 10 shows another variation. This flat anchor-type Speed nut can be used for regular blind mounting assemblies or for flush blind mountings. The special nut is riveted to the back sheet with flush-type rivets and has a "ball" like formation surrounding the Speed nut prongs and of sufficient curvature to span the standard dimpling for counter-sunk flat head screws and bolts as is shown in Fig. 10.

Where the bolt holes are too far

from the edge of the panel to permit snapping U or J-type nuts over the edge, the latching type as in Fig. 11 can be employed. It is effective any place on the panel. A rectangular hole is used to assure accurate alignment of Speed nut prongs over the bolt hole. To assemble, the lip of the nut is inserted into the square retaining hole and the nut pressed forward until the catch snaps into the hole. See Fig. 11.

In Fig. 12 a Speed clip is used virtually to nail the metal parts together. This is a tubular type of fastener which is pushed through a round hole in the backing panel from the front side. As it enters the hole, the cam-like prongs are compressed. When the clip is fully inserted, the prongs spring outward back of the panel to hold the clip firmly in position. With the clip snapped in place, a rivet bolt or stud can be pushed into it and will be firmly gripped by the curled-in end of the clip, to lock the assembly. This affords a permanent attachment for instruction plates, number plates, name plates and similar applications.

The removable type is illustrated in Fig. 13. Here at the end of the clip is an inward annular groove to give a firm smooth grip on the stud, bolt or rivet, permitting it to be removed by a steady outward pull.

The removable clip is widely employed for attaching various items of molding and trim. Fig. 14 shows a typical use—engaging studs for holding curtain support channels and interior cabin trim. The same method is also utilized for sealing strips and other trim.

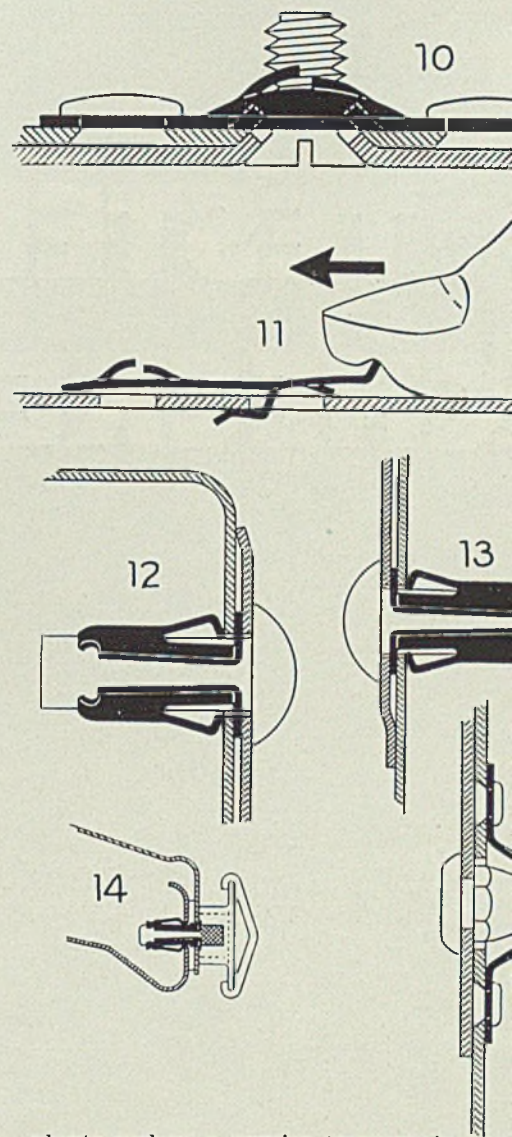
In Fig. 15 a ball stud engages a special Speed nut to form a snap-in attachment for hand-hole plates, inspection doors, etc. By dimpling the backing plate and using a flush screw to mount the ball stud, the entire attachment can be made flush.

In addition to those shown, there are some 800 other variations of Speed clips and Speed nuts already developed. For aircraft use, these are made from SAE 1060 special aircraft molybdenum spring steel, cadmium finished, although they are also available in several other materials and finishes.

Issues Standards on Bolts, Nuts, Rivets

Bolt, Nut and Rivet Standards, compiled by American Institute of Bolt, Nut and Rivet Manufacturers; cloth, 1750 pages; available from the Institute, Cleveland, at \$1 per copy.

This new edition supersedes one issued in 1935. It is published to aid production in manufacturers'

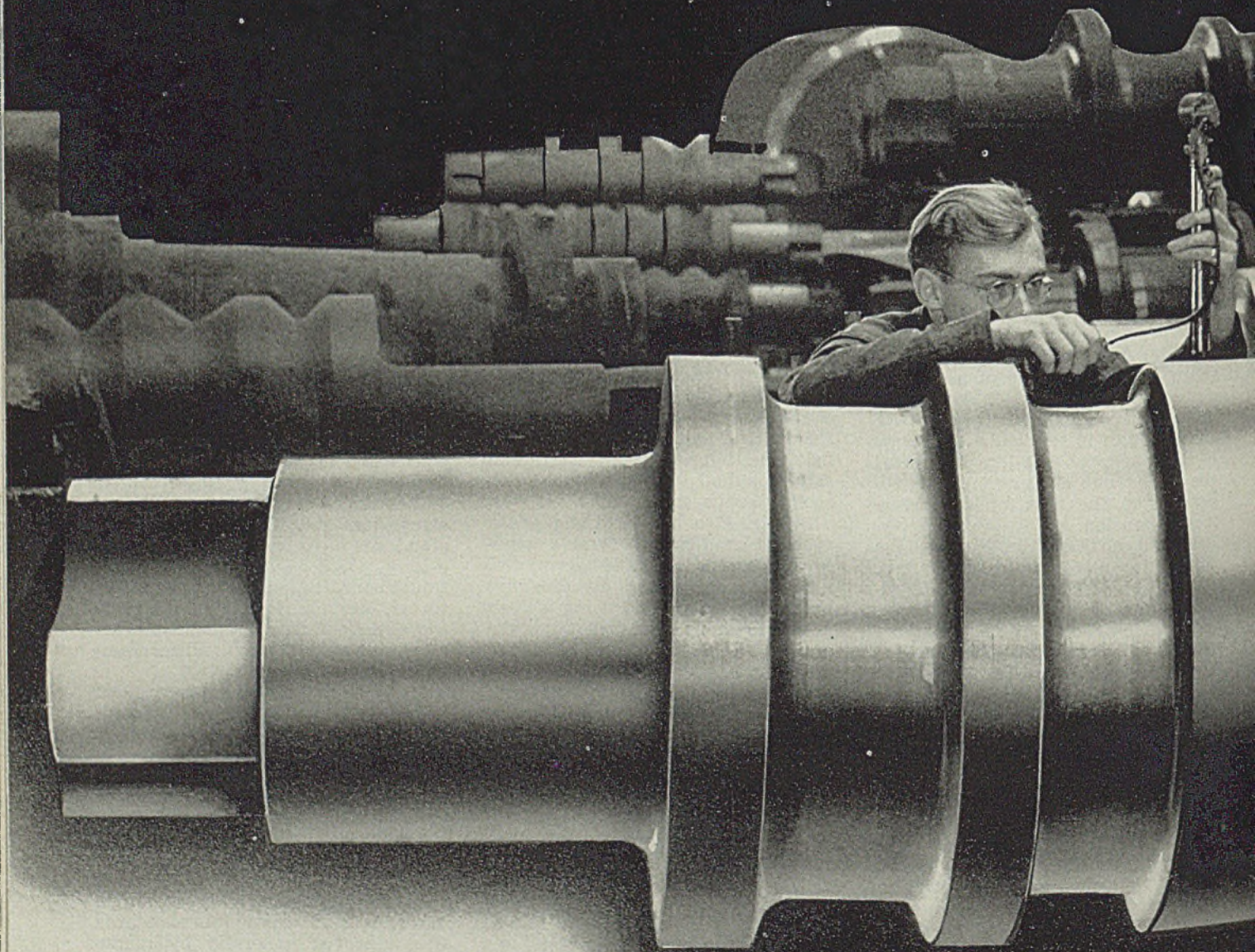


plants and as a service to users in acquainting them with accepted standards of nomenclature, dimensions, sizes and other practices. The standards have been developed over a long period of years through continual consultation among manufacturers, users, and national engineering societies. They represent practices that are practical and economical in manufacture.

Many of the standards have been developed and approved through the procedure of organizations such as the American Standards Association and the Division of Simplified Practice, United States Department of Commerce, with the participation of manufacturers. The remainder have been prepared by the institute with the co-operation of users and member and nonmember manufacturers. In all cases the standards are approved generally by manufacturers and represent established practice in their plants.

This new bolt, nut and rivet standards handbook was prepared by W. C. Stewart, technical advisor to the institute, under the supervision of the institute's committee on standards and technical practices.

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United Super X

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ENGINEERING & FOUNDRY COMPANY
PITTSBURGH, PENNSYLVANIA

Fabricating Truck Cabs

(Continued from Page 64)

three coats of finish enamel. Cabs are being sprayed in Fig. 5.

Now the cabs pass through the other side of the oven where they are again baked for 50 minutes at 225 degrees. Next operations on the line are to install the windshield, hardware, inside door panels, moldings, glass, upholstery and lining. The windshield is set in dumdum with rubber molding overlapping for full seal. Tubular rubber lace is employed all around the door to keep drafts out, and the door itself is rimmed with rubber strip to seal against air and moisture. All cabs are water tested.

Next wool insulation is cemented on the inside surface of all top and back panels, cement for this purpose being sprayed on. On all cab-over-engine models, the engine housing also is insulated. Every cab is completely lined with trim fabric. Seats are upholstered in leather with sponge rubber for a foundation. Cushions have three

adjustments and seat backs have four angular adjustments. Ventilation system includes a roof-type air intake and exhaust with two adjustable ventilators in the front panel. On cab-over-engine models there is a cowl ventilator in addition.

Many laborsaving devices are employed to facilitate production on the line. Hi-cycle electric drills, screwdrivers, belt sanders and disk sanders are a few. Small pneumatic drills weighing less than 2 pounds have been found a distinct advantage in working on the cab interiors since these units can be maneuvered readily in close quarters. They are used almost exclusively on the fit-out and trim section of the line.

Inspection includes not only that given incoming materials, but a constant scrutiny all along the production line. All functional parts such as doors and window regulators are given particular attention to be sure they operate properly.

Approximately 22 man-hours are required for production of a con-

ventional cab, including fabrication of the various parts. The ratio of production is about seven conventional cabs to one cab-over-engine type. Output rates, of course, vary with the number of men and the speed at which the line is operated. Close control is exercised so that not over 30 cabs are ever between the end of the cab assembly line and the point of usage at the chassis erection line where the cabs are assembled on trucks. At the present time, a cab is produced every 7 minutes ready for installation on a truck chassis.

More than 300 different combinations of cabs are built according to customers' demands and state regulations. For instance, in addition to the various types and sizes, there are different colors, different marker lights, different seat possibilities. Too, there are variations in floor boards, rear windows and all accessories. In addition, a large number of cabs are made for military purposes. Also many are made for export. Some of these are sectionalized for shipping by airplane.

FLAME-TENSIONING BAND-SAW BLADES

■ LUMBER-mill band saws require frequent retensioning, usually after every 20 hours of operation, to keep them operating with acceptable efficiency. The conventional method of tensioning saws has been to stretch the center of the blade by hammering and rolling to give it the necessary curvature or "crown." This method, besides being difficult and time-consuming work, makes the blade rough from hammer marks, which in turn causes friction while the saw is cutting. Recently, a new, simple method, using the oxyacetylene flame for obtaining tension in band-mill saws, has been reported to be saving 50 per cent in time while imparting to the saws a longer-lasting tension than could be obtained before.

This new method was developed by Peter J. Burish of Pendleton, Oreg.

Success of this method depends upon proper application of the heat. On a double-cut saw, for example, a strip of metal from $\frac{1}{4}$ to $\frac{5}{8}$ -inch wide just below each cutting edge should be heated to a blue-purple

color along the entire length of the saw. The saw should never be heated to a temperature higher than necessary to produce this characteristic color. The exact width of the heated band depends upon the size of the saw, the reason being that it requires more heat to crown a small saw than to crown a large one. As the edge metal cools it contracts—approximately $\frac{1}{4}$ -inch per 6 feet in length, giving the saw blade the desired tension.

A moderately small, closely controlled flame should be used and should be held so the end of the flame is about $1\frac{1}{2}$ inches away from the saw, with the welding tip inclined at a 45 to 60-degree angle toward the unheated portion of the saw. The forward motion of the blowpipe should be fast enough so the metal turns bluish after the flame is moved on. Flame-tensioning speeds for most of the saws treated by this lumber company approximated 48 inches per minute.

Following this heat-treatment, the saw is placed on a bench for inspection to determine whether any addi-

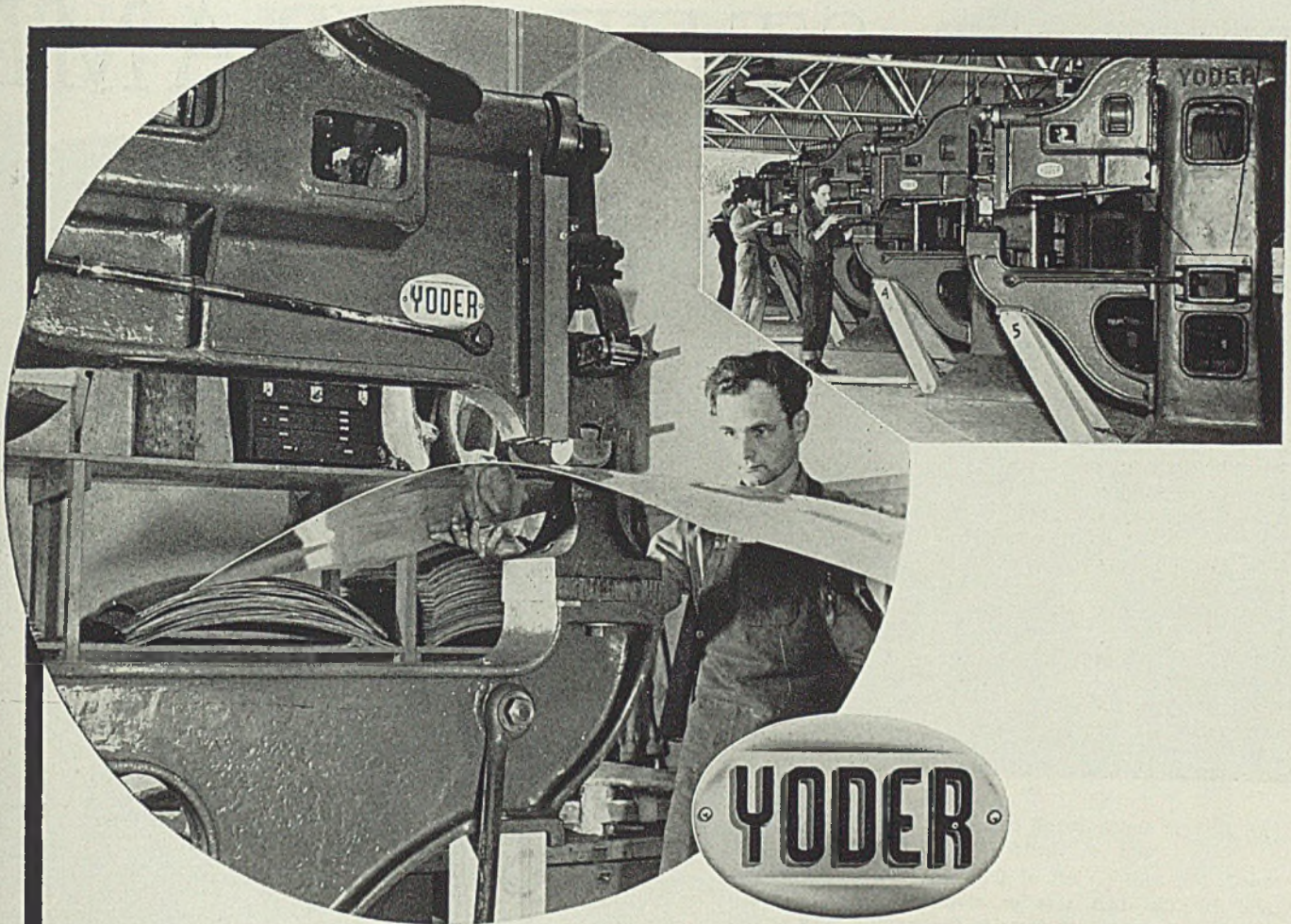
tional pulling or stretching is required. Experience has indicated that many flame-tensioned saws do not require any additional work, while a few require some rolling.

This company has been successfully tensioning all of its saws by this method for over a year, using the process first when the saws are new and treating them repeatedly. No cracks or crumpled teeth have developed that could be attributed to the heat-treating, nor has there been any softening of steel or any noticeable loss of temper caused by heating.

A specimen of band-saw steel taken from a saw that had been flame-tensioned many times was submitted to the manufacturer from whom the saw had originally been purchased. The manufacturer reported that as far as could be determined the sample submitted had not been damaged in any way, indicating that the steel had not been harmed by the flame-tensioning.

Illustrations courtesy The Linde Air Products Co., New York





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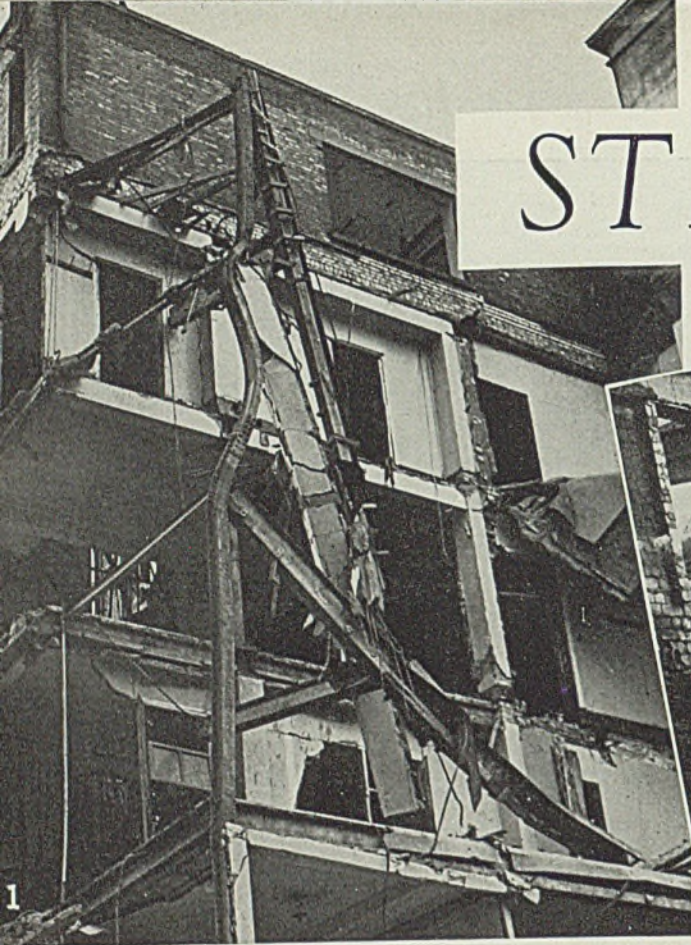


Fig. 1—This shows result of not anchoring floor beams into a vertical steel frame

Fig. 2—All that is left of this structure is being upheld by the two slender steel columns. Blowing away of the shop windows in the ground floor saved this building from collapse

Fig. 3—Part of a riveted compound girder after collapse

Fig. 4—A 9-story steel-frame building after a raid—burned out but framework still intact. Adjacent buildings in back have collapsed

Fig. 5—A steel-frame store and house, hit at an angle, can be repaired quickly as framework is still good although direct bomb hit on upper floors caused them to fall, taking some of lower floors with them

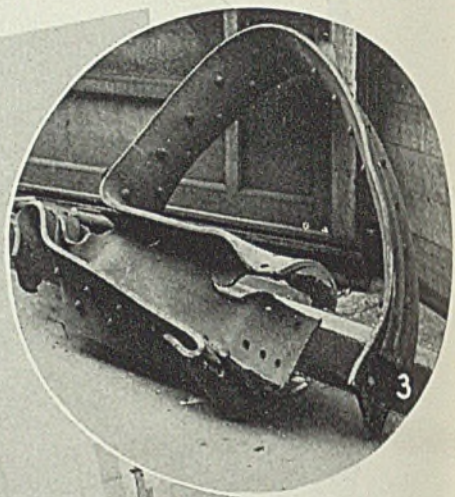
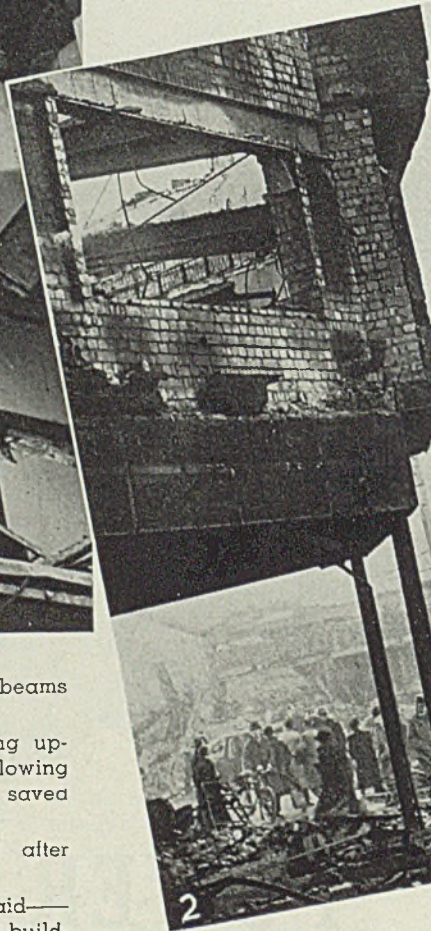


Fig. 6—Diagram showing how blast from high-explosive bomb was followed by suction wave which pulled floor beams from their support—resulting in collapse of the building since the floor beams with no anchorage at one end act as cantilevers to induce failure of the column at left

■ IMPROVED methods of design and construction will considerably increase the resistance of buildings against collapse from effects of bomb blast. That is one of the main lessons to be learned from experience in recent air raids.

It is a fact that old houses built of bricks suffered the worst damage; they just disintegrated under the blast from high-explosive bombs. Buildings with floors on steel girders simply laid on the brick walls did not behave much better. The walls were blown out, and the floors, deprived of their support, crashed down.

Fig. 1 shows that the floor girders, running from left to right, have lost the support of their right ends and have fallen down, while their left ends stuck to the steel column. The falling girders worked as cantilevers (see sketch, Fig. 6) and twisted the column to such an extent that it seems remarkable that

considerable parts of the building escaped collapsing.

Do not blame the architect of the house. In former times whoever had to consider horizontal forces beyond wind loads? It was only in recent years that the engineer became conscious of the possible effects of air raids and introduced completely new loads in his design. But, unfortunately, there is a long way from theory to execution in practice, and the fear of additional expenditure has prevented the general adoption of the new methods of design and construction.

What Happens? Fig. 3 gives an idea of the forces which must have produced such a deformation of a riveted compound girder. Its original section is shown in Fig. 7. The flange plate was torn off, taking the flange of the rolled steel I-beam with it. The rivets proved to have more strength than the steel in the web. It is remarkable what amount

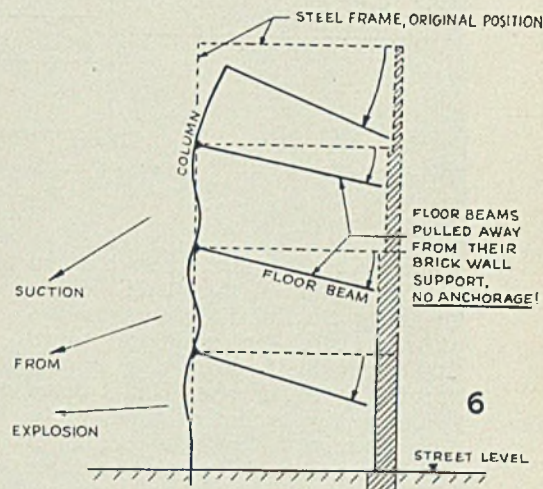
of toughness the steel has exhibited. The more so as such deformation actually takes place under speed conditions similar to sudden shock or impact, either caused by the explosion forces or immediately afterward during collapse. Metallurgists may wish to compare this photograph with those obtained after the collapse of the bridge at Hasselt, Belgium, in 1938. See O. Bondy, *Engineering News Record*, Aug. 18, 1938.

Fig. 2 shows two slender steel columns that have defied the bomb blast and the subsequent fire and still bear the poor remainders of the house. Probably the blowing out of the large ground floor shop windows saved this building, while the adjoining structures were completely wrecked.

How To Prevent Collapse: Compared with these older buildings where steel was only used for individual parts, especially for girders

BUILDINGS VS BOMBS

By O. BONDY
Consulting Engineer
24 Avondale Ave.
Worcester Park
Surrey, England



and supports more or less independent of each other, the up-to-date steel framed structures have shown much more resistance under air attacks. It is a fundamental law of modern design that the skeleton of steel or reinforced concrete has to stand the entire vertical and horizontal loading. On the other hand, floors and walls, both outside and inside, are merely to transmit their direct loads to the main frames.

The new construction, as shown in Fig. 8 anticipates a rigid connection between girders and columns of sufficient strength to take up bending moments. There are various types of such multistory frames, of course. Their common feature, important in view of air raid precautions, is that blast from bombs cannot break the girders loose from their bearings and let them fall down. Hinged connections, combined with sufficient horizontal anchorage, will do as well, provided there are other rigid frames in the structure to take bending moments from lateral forces.

Fig. 4 presents such a steel

framed building, nine stories high. One sees the extent of destruction suffered by the neighboring houses. While the steel framed building, too, is damaged by fire, as shown by the blackened parts above the windows, its main structural parts still remain uninjured. The destruction of the adjoining houses gives an idea of the forces which the steel-framed structure has withstood.

Heat Blows Up Tiles: The use of hollow tiles in floor construction may involve danger in case of fire. The air in the cavities is expanded by the heat and blows up the floor. In some such cases it has happened that all floors from top to bottom have collapsed, only the framework of the building remaining intact.

Finally, Fig. 5 shows the damage caused by a bomb hit at an angle on the top floor of a London multistory steel framed building. Result: Under direct impact from the explosion, the top floors have crashed down and taken some of the lower floors with them. Walls and windows were blown out, but the steel skeleton stood up to the attack very well and saved the whole build-

ing. It is comparatively easy to replace the walls and the floors of such a building if the load carrying frames have remained intact. Thus, people have been surprised to see how quickly steel framed multistory buildings in London, though heavily damaged, have been repaired and put into service again.

Recommendations: The time has not yet come for laying down definite building regulations to reduce air raid damage to the least possible extent. But there are already some lines of improved design and construction clearly to be seen. These are:

First, vertical and horizontal steel members must be connected so firmly as to enable them to take up horizontal forces. It does not suffice at all to lay the end of a girder on, or put it into, a wall without providing reliable anchorage or, still better, a rigid connection.

Second, the walls and panels filling the area between the steel members should be fixed in such a manner as to allow them to be blown out readily. Thus blast will not cause serious damage to the main structure. (This rule does not apply to shelters, of course, where just the opposite principle must be used.)

Third, it is necessary to improve protection against fire. If heat ob-

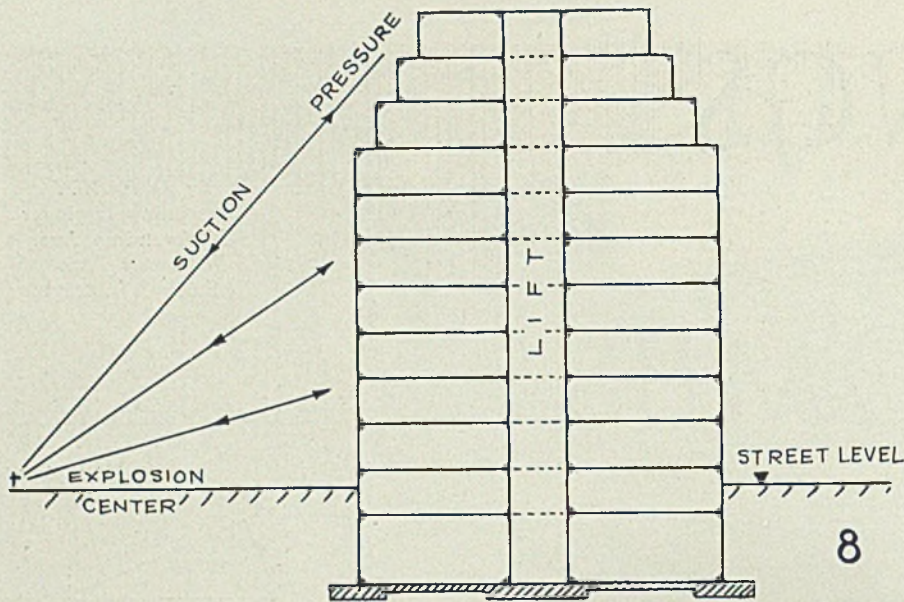


Fig. 8—One of many types of rigid steel-frame multistory buildings that has successfully withstood bomb attacks

tains access to the steel frames and deprives them of their load bearing capacity, the finest structure is useless. There are multistory steel skeletons in London and in the provinces so distorted and twisted by fire that their original shape can hardly be recognized. Steel members should be given ample insulation by use of concrete or masonry solidly fixed by steel wire mesh or similar devices. It is also

useful to fill concrete into the hollow cores of column sections.

Fourth, floors must be able to withstand fire lasting for hours. Certain types of hollow tiles, though possessing many advantages, should not be used for they are unable to withstand prolonged exposure to fire. Solid concrete floors with filler joists or steel reinforcement should be preferred.

One thing is certain: Experience

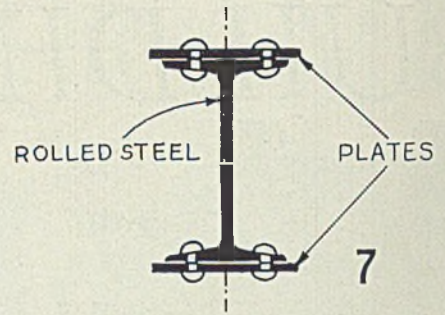


Fig. 7—Original cross section of compound girder in Fig. 3

from large-scale air raid damage will thoroughly influence future building design. Even up-to-date steel framed structures which, like reinforced concrete buildings, have behaved satisfactorily, have taught many new lessons. Steel structures for industrial, commercial and housing purposes will have to be built according to the experience gained in the past year. When properly designed and constructed, they will more than ever demonstrate the excellent qualities of steel as a structural material.

Forging at Titusville

(Continued from Page 60)

square inch of added load are taken and the results plotted until the yield strength of the steel has been passed.

The yield strength is then determined arbitrarily as follows: The stress-strain diagram for the specimen having been plotted, a straight line parallel to the initial straight portion of the diagram is drawn at a distance to the right equal to the "set" prescribed in the detail specification of the steel. The load corresponding to the point where this line intersects the diagram, divided by the original cross-sectional area of the specimen is defined as the yield strength.

The yield strength so determined is somewhat less than the "yield" with which the engineer is ordinarily familiar, and which corresponds to the short horizontal portion of the diagram prior to the rise in an approximately parabolic arc.

The Struthers Wells-Titusville Corp. undertakes machining operations on its barrels, and is being equipped for rifling. The sequence of operations on 37-millimeter units is as follows: Centering; first rough turn—check and straighten if necessary; saw to length and re-center;

rough turn outside; rough turn; bore; final rough turn; ream; second or finish ream—final check for straightness; rough and finish hone with same set-up. Larger calibers are rough turned and bored prior to quenching in order to permit the entry of the quenching medium to the center of the piece.

All experienced machinists have observed distortion of hardened and tempered parts after stock removal. A gun barrel is no exception to the general rule—in fact, on account of its physical character and long and slender form, and also because of the high accuracy demanded, it exhibits this peculiarity in rather a marked degree. The arrangements for determining accuracy of the bore and for returning the barrel to the truth are shown in Figs. 12 and 13. A pivoted search bar is used in conjunction with a dial gage in Fig. 12. An experienced crew is then able to "hit" the tube with the hydraulically driven die shown in Fig. 13 in such fashion that the departure from a straight line in the length of the barrel is returned to within the prescribed limits of 0.005-inch.

The tools used in the boring and reaming operations are shown in Fig. 14. The diamond pointed drill on the left drills the hole from the solid, and the packed bit shown in

its assembled and also dismantled form is employed to open up or "ream". The cutters, which in this case are of high speed steel, may be seen in the foreground and the arrangements whereby coolant is fed to the operating end of the bit may be observed in the disassembly.

One of the hardest tasks in machining guns of all calibers is to cut a straight hole. The bit of the type shown appears to answer about as well as anything so far tried, although the rock maple used for "packing" suffers from the severe treatment to which it is subjected since, in order to be effective, it must fit very tightly indeed in the bore behind the cutting tools. Only well seasoned maple should be used, and the moisture is preferably removed by a vacuum process before impregnation with special oil.

Fig. 15 illustrates setting up two gun barrels in a machine for boring. Drilling is conducted first from one end and then from the other, the two holes meeting near the middle of the piece. In the final honing operation, coolant is poured upon the outside of the barrel as well as pumped within it, lest a temperature rise, occasioned by the heat generated, cause distortion. In a short time, it is planned to retool the entire plant for use of sintered carbides wherever possible.

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Upping Output of

ANODIZED ALUMINUM

■ THE PROCESS of anodically oxidizing aluminum was dealt with in the article "Protective Finishes for Aluminum Aircraft Surfaces" (STEEL, March 10, 1941, p. 66) in which practice at the Buffalo plant of Curtiss-Wright Corp. was detailed. It is intended here to discuss a few ways in which output in some plants has been greatly increased—in the hope that this information may prove of value to aid others in improving their own production.

As explained in the article referred to above, the anodizing process involves essentially the formation of a thick resistant surface film of oxide as an integral part of the article. It is applicable only to aluminum-rich material. The 3 per cent solution of pure chromic acid has been standardized for many years and appears one of the best. Its use involves no corrosion of the apparatus with consequent stoppages for repair, recleaning, etc., nor is there any risk of corrosion by residual acid attack in crevices or joints. With chromic acid, any liquid remaining is not only harmless but exerts a powerful inhibitory action.

While the majority of the possible developments for improving the process have been covered by patents, there are three ways which can be used singly or combined to give an increased yield per working hour using chromic acid solutions. These are: First, alteration of the anodizing conditions using the standard solution; second, varying the solution and the conditions; third, increasing the efficiency of equipment and personnel.

Alteration of the Anodizing Con-

Here are a number of ideas which point to increasing the efficiency and output of your aluminum anodizing department. By careful planning along the lines suggested, one plant not only achieved an increase in total output from 5000 to well over 12,000 units per week, but also increased output more than 25 per cent per working hour

ditions: The current in the circuit is profoundly altered by changing the bath temperature and voltage applied. Higher current in turn permits the film to be formed more quickly, but the properties of the coating are changed at the same time. A careful study of the relationship of the operating conditions and the character of the oxide obtained enables the determination of optimum procedures.

A set of conditions widely employed specifies a temperature of

tions taking exactly 1 hour. Lower voltages or higher temperatures tend to give softer films of high absorbing power, while increasing the applied voltage or reducing the temperature of the bath results in harder, less absorptive coatings. To reduce the time required in the vat to produce a coating of the required resistance, it is convenient to employ temperatures lower than 40 degrees Cent. and to increase the voltage more rapidly than usual and to a higher value (refer to the Curtiss-Wright practice mentioned above).

Fig. 1 graphically presents typical examples of what can be done. It must be stressed that the control of temperature must be much closer than any standard process. For instance, aluminum can be treated successfully at 34 degrees Cent. plus or minus 1 degree by raising the voltage to 60 in 7 minutes and maintaining it for 28 to 30 minutes, giving a total treatment time of less than two-thirds the standard.

Electric Equipment Flexible? There are

several limitations to these alternative procedures, but as long as they are understood they are not likely to be troublesome. Both higher temperatures and higher voltages lead to higher current densities for a given material, so the capacity of the power plant

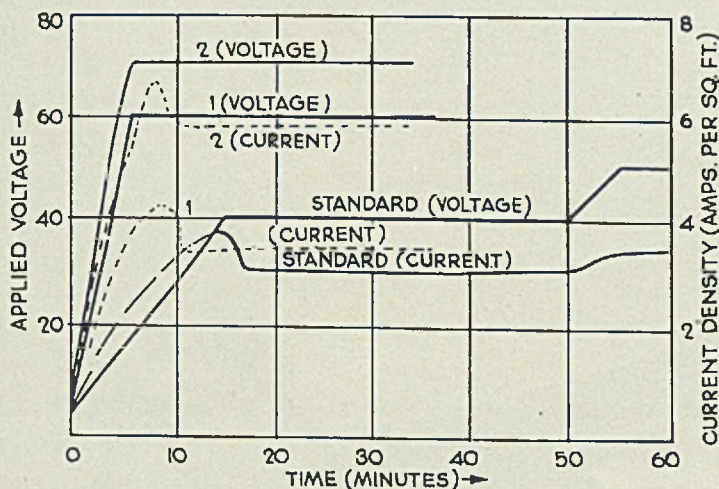


Fig. 1—Relation between current, voltage and time for various typical anodizing cycles. "Standard" is the normal Bengough-Stuart process with 3 per cent chromic acid at 40 degrees Cent. (1) is at same temperature but at higher voltage. (2) is at 45 degrees Cent. and higher voltage

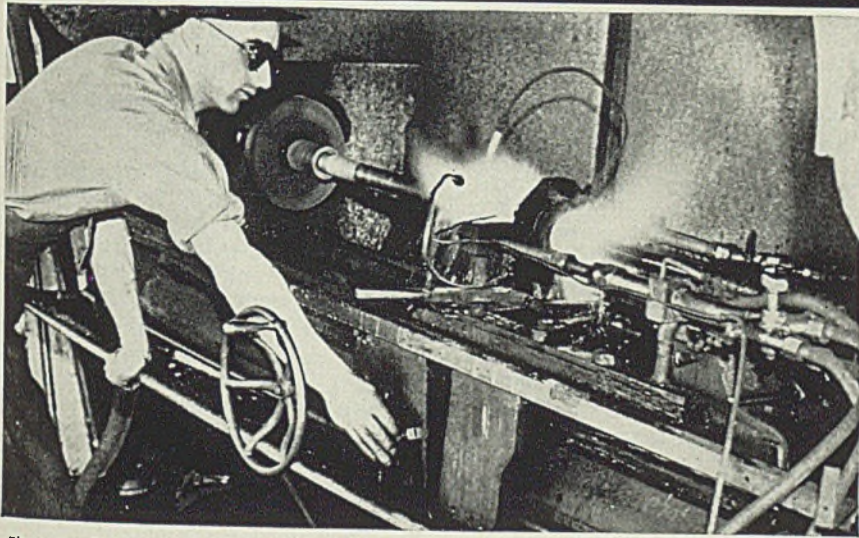
40 degrees Cent. plus or minus 4 degrees, the applied voltage being raised gradually to 40 and later to 50 volts to give a current density of 3 amperes per square foot for pure aluminum, the cycle of opera-

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must be sufficient to provide the required current without overheating. Further, some generators are designed for 50 volts as the maximum so some difficulty may be encountered in obtaining the 65 or 70 volts for these cycles. Usually it is possible to work out a set of conditions, however, that allows the existing plant to be used at a higher capacity without risk of damage or without expensive remodeling.

Another possible difficulty from increasing the voltage too rapidly is the occurrence of current surges, together with sparking beneath the surface of the liquid between ad-

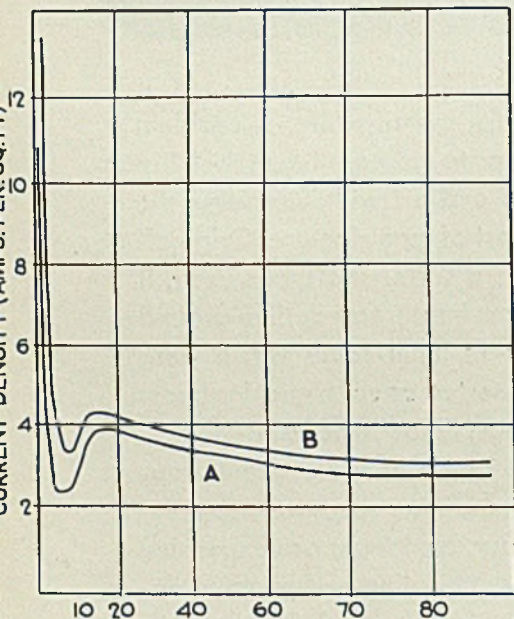


Fig. 2—Relationship between current density and time, using a chromic acid solution at 38 degrees Cent. A is at 40 to 50 volts; B at 50 to 60 volts

jacent objects. This results in a "burned" appearance and may damage the electric equipment. Care in increasing the voltage applied will prevent this danger. The voltage should be raised in small increments to allow the current to settle down to a steady value at each higher potential before the next one is applied.

Fig. 2 shows the type of relationship existing between voltage increase and the corresponding current, plotted against the time. It will be noted as soon as the specified maximum voltage has been applied the current remains substantially constant as revealed by the horizontal portion of each curve. A high instantaneous current also is shown by the peak at the extreme left.

Test Alloys: Maximum voltage permissible depends on analysis of the material, most alloys generally reducing this value. The actual

amount of elements added is of less importance than whether it is in solid solution or not, for insoluble constituents are preferentially attacked by the solution, leading to high current densities and a rough, open film. Preliminary trials are best for determining the optimum conditions.

Coatings produced with high voltage and low temperatures are much harder than standard films and are incapable of absorbing as much "dope" such as lanoline, but they are quite satisfactory as a base for paint, lacquer, etc. The flexibility is altered only a small amount, but the degree of absorption of moisture is affected considerably. Under conditions of high humidity, the degree of moisture absorption is particularly important in affecting the corrosion resistance and dielectric strength of the film.

Alteration of the Solution: Up to this point we have considered only operating conditions with normal 3 per cent chromic acid solution. The use of higher strength electrolytes has been advocated as they permit changing over from batch to a continuous system of operation. Concentrated solutions give thicker films, with standard techniques, also, and likewise a coating of required thickness is developed more rapidly.

There appears little advantage in exceeding a concentration of about 10 per cent. It is possible—indeed, advisable—to control the operation and bath by means of the acidity of the solution. This involves measuring the pH value of the electrolyte from time to time. The solution is a strong acid (low pH). Optimum conditions are: pH value of 0.15 to 0.5; temperature, 35 degrees Cent. plus or minus 2 degrees; applied voltage, 30 to 40 volts; current density, approximately 3 amperes per square foot.

A film of the same thickness as obtainable in the standard 3 per cent chromic acid solution is produced here in about 35 to 40 minutes—a substantial time saving. Also, the process can be used on a continuous basis, adapting it to automatic plants for mass production output.

Efficiency of Plant and Personnel: It may not be possible to carry out the necessary preliminary work to enable drastic changes in established routine to be made. Also, restrictions on the supply of chromic acid may make it undesirable to use stronger solutions. Therefore it is desirable to examine every detail of plant and procedure to insure maximum efficiency in every step of the process.

Considering equipment first, experience has shown that for a given tank size, increased capacity can be secured simply by a more

efficient arrangement of the various auxiliary components. The agitator often is placed in such a position that it occupies up to 10 per cent of the tank volume, while frequently pipes and valves conveying steam and cooling water to the solution may occupy a foot or more space at one end of the tank. It is quite practicable to take in all these pipes through the tank wall by means of welded joints, permitting their control valves to be located outside the tank. This affords greater usable volume of tank, thus increasing the effective tank capacity.

The temperature controller or indicator also may be relocated to advantage frequently.

Double Tank Capacity: In addition, the cathodes instead of being placed an inch or more from the sides of the tank can be placed within ¼-inch of the walls, or still better, can actually form part of the tank. Where the tank was originally intended to take one line of work as an anode, it generally is possible to use the center rod as an additional cathode rod, enabling two lines of work to be hung in the tank, forming two sets of anodes and thus doubling the productive capacity.

Also, considerable time can be saved by increasing the rate of heating and cooling, especially if this is associated with thermostatic temperature control.

Finally, equipment should be arranged for minimum movement in handling work in and out of the tanks. A clock provided near the instrument and control panel often may be found to improve the efficiency of operations by making possible a closer check on work cycles. Good lighting, too, is very important, especially when maximum headroom is required.

Operation and Control: The characteristics of the film produced are determined by a number of operating conditions. The advantages of strict control include assurance of quality and uniformity. These, together with the ability to estimate accurately the individual loads and hence the total output of the plant, are important.

First step in control is to draw up a rigid code specifying what is standard practice for each material and for each article to be treated. This should include current density given by a specified voltage at a stated tank temperature, also the length of time taken to increase the voltage from the start, the magnitude of each voltage increment, and total immersion time. It is possible to do this when the area of the component is known, and its anodizing properties determined, either by direct experiment or from previous work.

Such data, to be of maximum use, must be determined and recorded by the technical staff and placed at the disposal of the production personnel. The immediate supervisor of the anodizing department then can lay down working information for each load put through the tanks. Of course, completely repetitive work, once set up, needs little further control.

Care of the Solution: There are two points requiring attention—the maintenance of the chromic acid content and the determination of impurities. With the standard 3 per cent chromic acid solution, the quality of the film deteriorates seriously if the concentration falls below 2.5 per cent.

Planning Loads: Here is where the most time can be saved, and where in many plants will be found the greatest possibilities for increasing efficiency. Collaboration between the production controller and the tank operator is essential if maximum output is to be obtained. Advance planning is of utmost importance. Loads must be planned several batches in advance so the details of current, voltage increment, etc., can be worked out and the required time allocated.

Wherever possible, it is wise to take advantage of the full capacity of the electric equipment by plan-

ning each load so it exposes a total area that coincides with maximum electric capacity of the plant. For example, if the generator is capable of an output of 900 amperes, each load should total 300 square feet if the current density is to be 3 amperes per square foot. This must include the material used for holding the work, and of course the tank must be of suitable size.

A daily time table often aids efficiency. Planning such a time table is easy with the standard 3 per cent chromic oxide process, consuming an hour exactly in connection with batch work. For such a time table it is necessary to know the time required for loading and unloading the tank, and it is right here that surprising savings can be made.

Cut Loading Time: For instance, it may well be worth while to employ extra operators in the shop simply to assist in cleaning the work and loading the tanks as such assistance may enable one or more extra loads to be treated each day. The actual loading operation is speeded if individual articles are jigged or wired onto frames previously.

Get An Over-All View: It is impossible to overstress the value of a careful survey of the plant, the personnel and every detail of procedure. Only then is it possible to

eliminate weak points of existing procedure.

An example of what can be achieved by careful planning is shown by one plant which introduced a 2-shift system under close control and increased output 25 per cent per working hour.

This plant originally was working 44 hours per week from 8:30 a. m. to 12:30 and from 1:30 p. m. to 5:30 on five days and from 8:30 a. m. to 12:30 on Saturdays. In that time the output was just under 5000 units each week. There were six tank loads of work per day, three in the morning and three in the afternoon, making a total of not more than 32 per week.

When a 2-shift system was introduced, it was found possible to reduce the time to load and unload the tanks to about 5 minutes by employing extra labor for that particular period. The new shifts run from 6 a. m. to 2 p. m. and from 2 p. m. to 10 p. m., giving 14 loads through the tanks each day, with 15 loads occasionally under favorable conditions. Weekly output now averages 72 loads or 12,000 units per week of 80 hours. Note that this output is not only double the previous one by more than 2000 units, but also—and what is more important—an increase of over 25 per cent is obtained per working hour.

Quenching Media

(Continued from Page 68)

Water, however, could not be classed as a volatile liquid and its conductivity for heat is not high. The addition of salt apparently increases the cooling effect—at least in the case of items of small cross section.

By contrast with water we reproduce herewith the results of experiments by Matthews and Stagg, through the courtesy of Carnegie-Illinois Steel Co., obtained while experimenting with a number of different oil baths. These curves indicate that for the majority of the samples tested, the rates obtained with oils were about half of those

secured when using water and brine; while the very viscous samples were about a third or less. In carrying out these tests, a suitable specimen of steel was carefully heated to 1200 degrees Fahr. and quenched in 25 gallons of the medium under consideration. The time required to cool the piece down to 700 degrees was carefully observed with a stop watch, the rise in temperature of the medium being noted at the same time. This procedure was repeated until the medium had reached 250 degrees Fahr. or its boiling point. Concerning the manner in which the quench was carried out in each case with respect to the degree of relative movement between

work and medium, no information is available.

Speaking generally, mineral oils are more stable than vegetable or animal oils, continued use tending to render the latter "gummy." Sperm (whale) oil, however, has been in use in the steel districts of England for a great many years.

Another series of experiments from a different source and using still baths indicates that sperm oil has about one-third the cooling power of water; while comparable figures for machine oil, paraffin oil, palm oil, rapeseed oil, olive oil, and neatsfoot oil are given as 0.022, 0.29, 0.15, 0.22, 0.37, and 0.33 respectively.

In some cases—for example, in quenching alloy steel gun forgings—it is not desirable to permit cooling to proceed to the temperature of the bath and it is in fact desirable to remove the piece from the bath at such a temperature that the flash point of the oil is an important consideration. The flash point, it may be recalled, is that temperature at which the oil will give off vapors in sufficient quantity to produce an explosive mixture when mixed with air. The fire point is the lowest temperature at which the vapors given off will burn continuously when ignited.

A few data on familiar oils are given in Table I.

TABLE I—Characteristics of Certain Oils

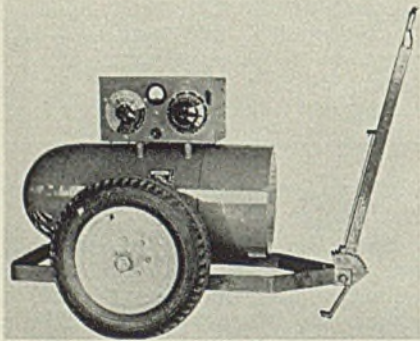
	Sp. Gr. at 60°	Flash Point	Fire Point
Transformer oil	0.869	311	360
Machine	0.909	405	464
Paraffin	0.879	325	370
Fuel	0.856	205	219
Palm	0.874	435	486
Rapeseed	0.963	379	444
Castor	0.963	565	640
Cottonseed	0.925	610	680
Olive	0.917	590	680
Lard	0.917	565	685
Fish	0.933	401	446
Sperm	0.885	500	581
Neatsfoot	0.922	500	621

(From Metals Handbook)

Industrial Equipment

Welding Machine Trailer

Lincoln Electric Co., 12818 Coit road, Cleveland, announces a new 2-wheeled light-weight pneumatic-tired trailer for transporting arc welding machines about. It can be used for road towing up to approximately 30 miles per hour, can be hitched to a factory mule or industrial truck and is easily moved by hand. The welder is mounted on it by means of four bolts in the trailer frame. The trailer's combination two bar and standing support has a hand-operated ratchet arrangement

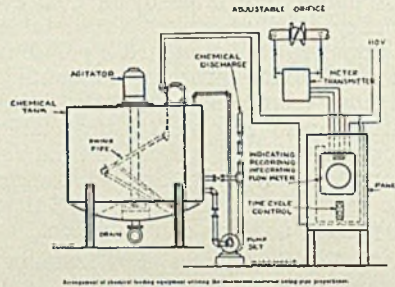


for locking the support arm in position. The unit measures 66 inches long, 42 inches wide, 16 inches high (over tires) and weighs 282 pounds.

Electrically-Operated Chemical Proportioner

Cochrane Corp., Seventeenth street and Allegheny avenue, Philadelphia, announces an electrically-operated chemical proportioner for proportioning a number of individual chemicals to water conditioning systems in accordance with makeup requirements. Of the swing-pipe type, it is controlled from an electric flow meter provided with contacts on the integrator train. When the predetermined quantity of water has passed through the meter orifice, the integrator closes a contact in an electrical circuit, including a time-cycle relay. The latter starts the proportioner motor, which lowers the draw-off pipe and then after a definite interval stops it. To increase or decrease the chemical

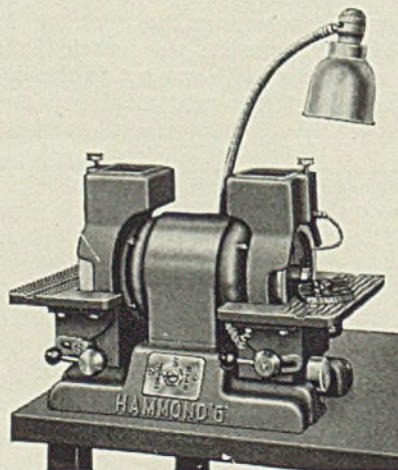
dosage it is only necessary to increase or decrease the duration of running the geared motor, which is done by turning the timer knob on the panel. The timer dial is marked in terms of minutes or seconds. Any number of chemical feeds can be controlled from one meter, but can be adjusted independently. In order to adapt this method of control to widely differ-



ent loads, provision is made for varying the interval between charges and the duration of running the geared motor inversely one to the other. The geared motor is of rugged construction and of a type that is magnetically locked in position when current is off.

Carbide Tool Grinder

Hammond Machinery Builders Inc., 1611 Douglas avenue, Kalamazoo, Mich., has placed on the market a new carbide tool grinder using 6-inch silicon carbide or diamond wheels. It stresses heavier, machine tool construction for additional strength and solidarity demanded by present production schedules. It also features extra-heavy removable tilting tables. The tables are slotted for the protractor angle-guide furnished with machine. Also, the inside edge of each table is machined inward at an angle to permit tilting without necessitating readjustment of the distance between table and wheel. The cast iron support under each table also

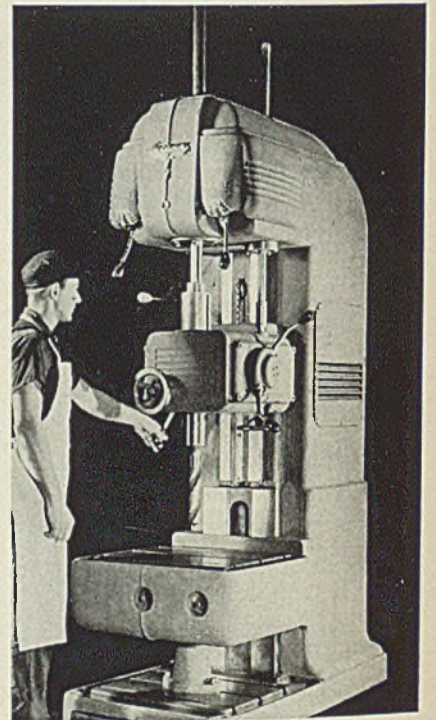


serves as a sludge pan and is easily removed and cleaned by releasing the same clamp that locks the tilt-

ing table to the supporting shaft. For providing accuracy in grinding angles, an indicator, ranging from 0 to 25 degrees is included directly beneath each table. Tables tilt to exact angle of adjustment easily, sliding on machined quadrants. The grinder's ½-horsepower motor is a heavy-duty type running at 3450 revolutions per minute. It is reversible for right or lefthand grinding. For wet grinding, an integral wheel guard and coolant tank may be substituted for the standard cast iron wheel guard. Coolant is carried to the wheel via a copper tube.

Drill Press

Sibley Machine & Foundry Corp., South Bend, Ind., has introduced a new 25-inch swing all-geared drilling machine for produc-



tion work as well as heavy, tough drilling jobs. Instant change of feeds and speeds are effected by levers within easy reach of the operator. Both levers are cam operated. Spindle speeds range from 75 to 1500 revolutions per minute, and feeds range from 0.005 to 0.045-inch. The 6-splined spindle of the unit can be operated either by power or hand feed; the travel by power is 12 inches, and by hand, 12½ inches. All controls are centered in front of the machine. The all-geared drive is obtained through a series of gears mounted on horizontal shafts. The transmission is totally enclosed, but is a complete removable unit. Multispindled shafts are used throughout. All gears operate in oil. Tapping operations are controlled by electrical reversing switches, operating through a start-

Helpful Literature

1. Heat Treating

Upton Electric Salt Bath Furnace division—8-page illustrated bulletin No. 129-4 presents description of "Electro-thermic Permeation" principle of heat treating. Method, which is suitable for hardening of various "Moly" high speed steels being substituted for 18-4-1 tungsten types, is available in any of complete line of "Upton" furnaces.

2. High Strength Bronze

Bartlett Hayward division, Koppers Co.—Single data sheet deals with "D-H-S" bronze. Recommended uses, general description, properties, cost and applications are covered. Table indicates minimum physical properties.

3. Distribution Duct

BullDog Electric Products Co.—12-page illustrated bulletin No. 412 explains features of design and application of "Lo-X Bustrubution Duct", of low reactance type. Voltage drop curves, specifications and dimensional data are included.

4. Centrifugal Pumps

Worthington Pump & Machinery Corp.—4-page illustrated bulletin No. W-304-B2 is descriptive of two stage volute, B2 is descriptive of two stage volute, type U centrifugal pumps which may be used with turbine, engine or belt drive. Design and construction is shown with sectional drawing. Specifications are given.

5. Porous Bearings

Keystone Carbon Co.—24-page illustrated catalog lists additions to line of "Selflube" porous bearings. Properties and uses of these self lubricating bearings are described. Details for correct method of installation are given. Standard sizes are listed for plain, flanged and thrust bearings. Graphs show allowances for press fit into housing and running fit after installation.

6. Thermometers

C. J. Tagliabue Manufacturing Co.—4-page illustrated bulletin No. 1229 shows principal forms and connections for industrial thermometer applications. Construction features are explained by text and cut-away drawings.

7. Chain

S. G. Taylor Chain Co.—28-page illustrated catalog, "Taylor Made Products," is collection of catalogs on chains. Sling and crane chains, coil chain, high carbon electric weld loading chain and log chain are some of types covered. Data are included on chain terminology and safe loads for chains and slings for different variations in angle of load.

8. Welding Metals

Stoody Co.—48-page illustrated catalog No. 106 gives complete information on characteristics of hard facing alloys, tungsten carbide inserts, tungsten carbide in tubes, and welding electrodes. In addition, aerial, flexible shaft and universal oil tool grinders are described. Recommendations are included for various types of hard facing metals which are applied by acetylene or electric arc.

9. Transformers

Wagner Electric Corp.—4-page illustrated bulletin No. TU-34 describes new type of transformer which has integral protection against both surges and overloads. Design features of these type HEBF-EP transformers are explained.

10. Metal Band Saw

Wells Manufacturing Co.—4-page illustrated bulletin No. 175 gives complete specifications on two sizes of metal cutting band saws. No. 8 machine will handle up to 8 x 16 inches and No. 5 unit will cut up to 5 x 10 inches. Gravity feed is controlled by hydraulic frame check.

11. Cupolas

Whiting Corp.—24-page illustrated bulletin No. FY-100 is complete discourse on "Whiting" cupolas. Typical foundry layout is shown in large drawing. Features of cupolas, tuyere, air supply and control, hot blast type, mechanical charging, sizes, capacities and specifications are some of data given.

12. Electric Welding

Westinghouse Electric & Manufacturing Co.—Illustrated catalog section 26-200 describes constant potential direct current welding system for supplying welding energy to multiple arc circuits. Motor generators, mechanical parts, controls and motor starting equipment are discussed. Wiring diagram shows electrical arrangement.

13. Compressors

Pennsylvania Pump & Compressor Co.—16-page illustrated bulletin No. 194 presents complete information regarding line of horizontal, single stage, heavy duty compressors. Sectional view explains features, which are amplified in text. Typical drive methods and other data are included.

14. Unit Heaters

Reznor Manufacturing Co.—12-page illustrated catalog No. U41 describes gas-fired suspended unit heaters in fan, blower and duct types. Sizes, construction materials, controls and capacities are given, together with general descriptions of each model. Accessories including thermostats, floor bases and louvre frames are listed and described.

15. Duplicating Tools

O'Neil-Irwin Manufacturing Co.—Illustrated data sheet, "Die Accuracy Without Dies," gives complete specifications on "Micro" die duplicating bender, shear and brake. These tools permit duplication of metal shapes in small runs without use of dies.

16. Anti-slip Stair Treads

National Bronze & Aluminum Foundry Co.—4-page illustrated bulletin points out safety factors provided by use of "Ten-Lox" anti-slip stair treads and floor tile. This product is aluminum casting impregnated with abrasive to give complete safety underfoot.

17. Reciprocating Tool

H & H Research Co.—4-page illustrated bulletin, "It Saws, Sands, Hones, Files," describes many of multitude of operations which can be performed with reciprocating "Multi-Purpose" tools. This equipment, which is available in six models, may be used for work ranging from light chipping to removal of burr from heavy steel castings.

18. Oil Burner Motors

Emerson Electric Manufacturing Co.—4-page illustrated bulletin No. X3941 presents advantages and performance data on line of oil burner motors. Dimensional information is given for 1/2 and 3/4 horsepower models. Features are explained through use of disassembled view.

19. Flexible Metal Hose

Pennsylvania Flexible Metallic Tubing Co.—8-page illustrated bulletin No. 52-G gives complete information on bronze steam hose and clincher couplings. Plain, wire braided and armored types are described. Complete specifications and list prices are given for various types and sizes.

20. Cutting Machines

Andrew C. Campbell division, American Chain & Cable Co.—Illustrated folder, patterned after cut-off section of 6-inch bar stock, explains savings possible with "Campbell Cutomatic" cutting machines which make smooth accurate cuts through bar stock up to 6 inches in diameter in annealed or unannealed alloy steel.

21. Metal Cutting Saws

Capewell Manufacturing Co.—14-page illustrated catalog No. 140 is descriptive of complete line of metal cutting saws. Hack saw blades, as well as metal cutting band saws are covered. In addition to providing data and prices on each type, cutting speeds and helpful hints on proper use of saws are given.

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22. Pot Furnaces

A. F. Holden Co.—8-page bulletin describes use of pot furnaces for normalizing of forgings, continuous salt bath hardening, wire patenting, heating of soldering irons, bright tempering, direct process annealing, and austempering. Sizes, capacities and range of operations for pot furnaces are given.

23. Riveting Machine

Tomkins-Johnson Co.—4-page illustrated bulletin No. RK-1 is descriptive of new type of automatic feed "Rivet-Pierce Rivitor" for riveting previously unpierced work. Work is driven down over underfed rivet, punching slug out. Rivet is set at next stroke of machine.

24. Castable Refractories

Johns-Manville—4-page illustrated bulletin No. RC-13A is devoted to hydraulic-setting refractories suitable for doors and other linings, burner rings, furnace bottoms and special refractory shapes. Tabular data shows three types of "Firecrete" with temperature limits of 2200, 2400 and 2800 degrees Fahr. and chrome castable refractory for temperatures up to 3200 degrees Fahr.

25. Dipper Parts

American Manganese Steel division, American Brake Shoe & Foundry Co.—24-page illustrated bulletin No. 641-D describes and depicts design changes over years of "Amsco" renewable lip dippers, standard present day models and special types of dippers. Accessories such as dipper teeth, lips, fronts, backs, doors and other parts to meet specific digging conditions are also covered.

26. Power Assembly Tools

Black & Decker Manufacturing Co.—56-page illustrated data book on power assembly tools presents complete information on portable electric screw drivers, nut runners and tappers. Valuable data are included on sizes of pilot holes; bolt, nut, cap screw and lag screw sizes; socket wrenches and tap drill sizes.

27. Thermocouples

Wheelco Instruments Co.—32-page illustrated "Thermocouple Data Book and Catalog" No. S2-3 gives descriptions, prices and recommendations on use of thermocouples, lead wire, thermocouple wire, heads, connectors, plug and socket assemblies, insulators and protecting tubes. Data are included on temperature conversion, pipe and wire sizes, millivolt tables, wire resistances, and thermocouple construction.

28. Group Washing

Bradley Washfountain Co.—24-page illustrated booklet is pictorial presentation entitled, "Bradley Washfountains and Multi-Stall Showers On the Job." Brief explanatory legends with each illustration reveal advantages of modern sanitary group washing facilities in industry, schools and institutions.

29. Flexible Bearings

Harris Products Co.—8-page illustrated folder presents data on "Torflex" flexible bearings. This includes radial loads, radial and axial deflections, rubber wall thicknesses and capacities of stock sizes available from 1/8 to 5-inch diameters. Typical applications are shown in range of uses from heavy duty cement mill supports and drag line scraper drives to rayon spinning bobbins.

30. Galvanized Sheets

Newport Rolling Mill Co.—4-page illustrated bulletin relates advantages of "Colorbond" galvanized sheets. This sheet is treated to receive finish coats immediately without further processing. Sample of "Colorbond" is included.

31. Flexible Shaft Machines

Walker-Turner Co.—8-page bulletin No. FS-41 reports on flexible shaft machines for use in defense industries. Models are described for use in grinding, polishing, burring and for other operations. Machines illustrated range from heavy duty models to commercial and intermittent duty types, and include bench, floor, and suspended models in direct, multi-speed and two-speed geared drives.

32. Air Operated Controllers

Brown Instrument Co.—36-page illustrated catalog No. 8903 describes air operated controllers for temperature, pressure, flow, liquid level and humidity. Large photographs of instruments and installations are featured throughout and diagrams outline principle of operation.

33. Metal Spraying

Metallizing Co. of America—52-page illustrated bulletin "The History, Purpose and Practice of Metallizing" comprises pictorial display of metal spraying applications. Large schematic view shows operation of metal spraying gun. Text gives brief resume of history and purpose of process.

34. Large Compressors

Trane Co.—24-page illustrated bulletin No. 32-G describes large "Turbo-Vacuum" compressors for air conditioning and industrial processing service. Mechanical features of individual parts are covered in separate sections. Typical layouts and cycle of operation are charted and described in detail. Line drawings give dimensional data and explain purge system.

35. Carbide Tool Grinding

Norton Co.—64-page spiral-bound handbook No. 167-5P gives information for reconditioning and sharpening single point cemented carbide tools. Each of several sections is devoted to various types of grinding wheels and how to use them. One section contains grinding hints, recommendations, and essay on importance of proper grinding. Action photographs show grinding operations on standard makes of grinders.

36. Hack & Band Saws

Spartan Saw Works, Inc.—40-page illustrated pocket-size booklet catalogs band saws for cutting dry ice, wood, metal and meats. Description of features, operating characteristics, width, gage, number of teeth and prices are given for various types of both band and hack saws. Several charts and tables present useful general information for saw users.

37. Pumps

International Nickel Co.—16-page illustrated bulletin is entitled "Practical Pumping Problems and How They Are Solved". This describes actual experiences of pump users with nickel alloy pump parts for service in handling corrosive solutions. Section tells how to choose metal for pumping corrosive liquid. Photographs of pumps in service are presented.

38. Electric Traveling Cranes

Bedford Foundry & Machine Co.—4-page broadside pictures and briefly describes some of recent electric traveling cranes. List of users is included.

39. Die Steel

Jessop Steel Co.—6-page folder No. 441 describes "CNS" high carbon, high chrome die steel for general purpose work where wear resistance combined with shock resistance is needed. Forging, annealing, hardening, tempering, applications and performance are covered. Curves show tempering ranges, coefficient of expansion and Izod impact value.

40. Belting

B. F. Goodrich Co.—Catalog section No. 2140 announces line of "Multicord" belting. It discusses construction and advantages of this type belt, including application of "Plylock" splice to make belts endless on pulleys in plant. Tables of minimum pulley diameters and approximate weights of 100 foot lengths of varying widths are included.

41. Motor Controls

General Electric Co.—8-page illustrated bulletin No. GEA 3531 is titled "How To Select Control For D-C Motors." Subjects covered include functions of direct current controller, types of controls, manual versus magnetic control, methods of control, protection afforded by various types, and methods of stopping motors quickly. Wiring diagrams supplement text.

42. Scale & Rust Remover

Oakite Products, Inc.—20-page pocket-size booklet No. 4305 outlines features of compound No. 32 for safe removal of hard water scales, rust and similar deposits from equipment, parts and other metallic surfaces. Method of use is given for compressors, condensers, diesel, gasoline and gas engine cooling systems, oil coolers, refrigerating equipment, paper mill equipment and water meters.

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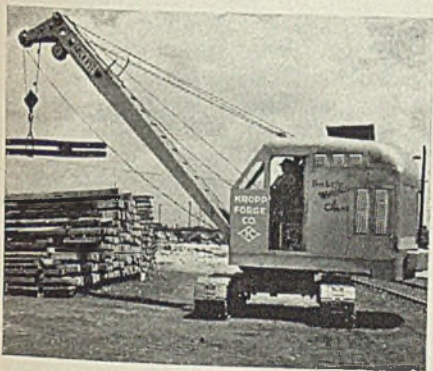
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ing lever. The drill has an overall height of 9 feet 6 inches. The maximum distance of its spindle to the base is 33 inches. Working surface of the table is 18½ x 24 inches.

Yard Crane

■ Buckeye Traction Ditcher Co., Findlay, O., has placed on the market a Clipper yard crane equipped with a short gooseneck boom said to provide greater stability under heavy loads, facilitating car loading and unloading and working in close quarters. It provides handling of lengthy objects in confined space despite the short boom. It enables stacking of material 20 feet high or more. All operations in the work cycle of the crane such as swing, boom raising or lowering and load hoisting, are controlled by vacuum power. Six small handles on a "desk type" control board perform various operations. The control system eli-

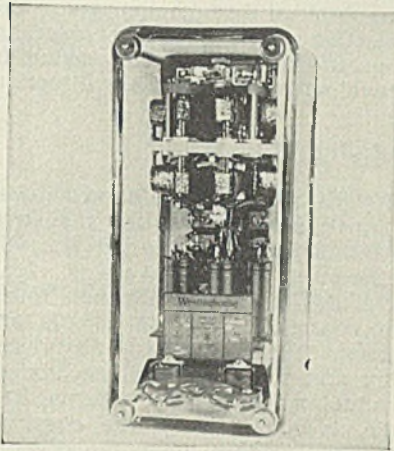


minates trouble from freezing in winter and condensation of moisture in summer. Other features of the crane include: 175 feet per minute minimum hoist speed; welded steel box type boom; safety power drum brakes; quick convertibility to shovel, dragline or lifting magnet. It also travels, swings and hoists simultaneously. The machine is available in three models of 5, 6½ and 7 tons capacity.

Directional Relay

■ Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has introduced a new series of relays for use in directional discrimination in the detection of phase and ground faults. Although generally installed along with fault detector relays, these types H-3 and HV-3 high speed, 3-phase directional units are also used with frequency relays to trip tie line breakers on under or over frequency. The directional element consists of three electro-magnets and three loops around a vertical shaft. On the outer legs of each magnet are two voltage coils

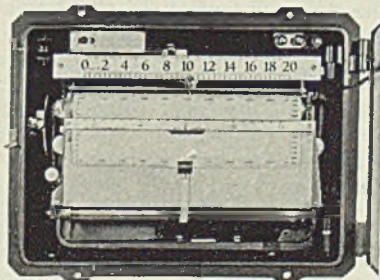
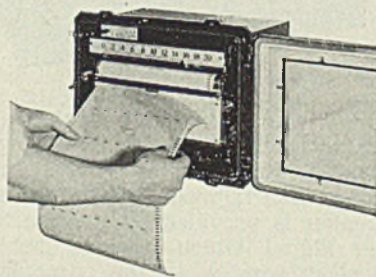
and the applied voltage induces a large current in the loop by transformer action. The current coil is on the center leg of the electro-magnet, and the applied current produces an air gap flux. This flux interacts



with the loop current and causes rotation of the shaft in a direction corresponding to the instantaneous direction of power flow. The voltage restraint element is similar to the directional element except no current coil is used. Double-throw silver contacts permit application to either single line or parallel line protection. The contacts will close 30 amperes at 250 volts direct current and the auxiliary relay (contactor switch) will safely carry this current long enough to trip the breaker.

Daily Strip Chart

■ C. J. Tagliabue Mfg. Co., Park and Nostrand avenues, Brooklyn, N. Y., has introduced a new tearoff

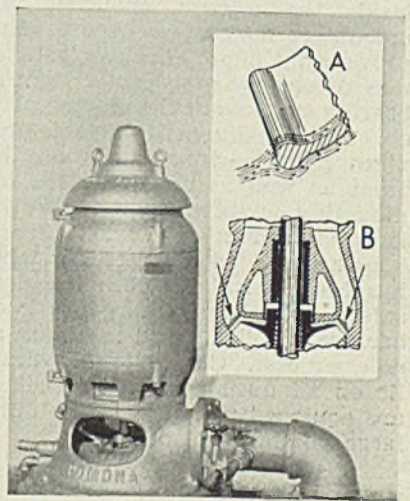


feature which can be installed on its Celestray recorders and recorder-controllers. It consists of a tear-off bar and a reroll with clip and tape. The clip, of a special design without springs, firmly grips the

chart after a chart section has been removed. This feature is said to be particularly useful for daily records as well as a complete record of any batch or run. The chart strips also can be filed for ready reference.

Vertical Turbine Pumps

■ Pomona Pump Co., Pomona, Calif., announces design improvements in its pumps instrumental in increasing efficiency as much as ten per cent. These, now included in all size vertical turbine pumps, involve changes in the guide vanes, function of which is to alter the flow direction of fluids being pumped. The vane ends are now of a bulbous shape and regardless of the flow direction of the fluid, its direction is always substantially tangential to the vane surface. Thus, greater uniformity of flow pattern is secured, friction is re-

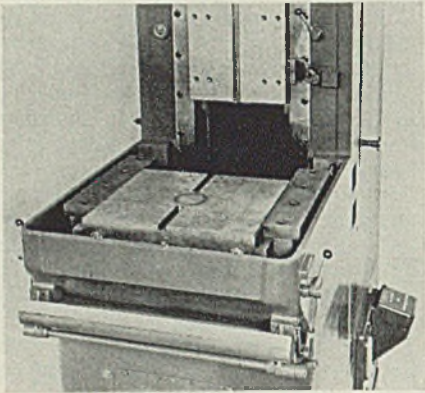


duced and efficiency of fluid lift is increased. Furthermore, eddy currents are not developed. Inasmuch as the new guide vanes are an inherent part of the pump bowl assembly, it is not necessary for the owner of a vertical turbine pump to purchase a complete new pump in order to take advantage of the new design. It is only necessary to substitute a new bowl assembly.

Broaching Machines

■ Colonial Broach Co., 147 Jos. Campau street, Detroit, announces a line of eleven single ram broaching machines which feature increased size of work table and ram. Each machine is adapted to a wider range of tooling, and peak capacities of each has been increased to give ample reserve power. Normal capacities of the various sizes range from 3 tons and 36-inch stroke up to 25 tons and 66-inch stroke for the eleven standard models. Column widths on each unit have been increased, permitting increased ram

width and better support for wide bars. The work platen has also been increased in width. All machines embody an entirely new cylinder design using seamless steel tubing in connection with welded construction for leak-proof operation. Another feature is the vertical mounting of the main drive motor



inside the column, reducing the amount of floor space needed. Improvements allow effective installation of chip wipers, protecting the bearing surfaces of the moving platen. The new design of the table provides finish-machined pads on the front as well as on both sides for mounting auxiliary units. In the larger machines of the new line a longer travel of the receding table has been provided. Both the dual safety control and emergency knee bar are supplied on all machines at no extra cost. Control is all-hydraulic on all machines. All machines are equipped with the heavy duty, large volume coolant pumps.

Mobilcrane

■ Osgood Co., Marion, O., announces a new improved model 705 WM Mobilcrane incorporating several new features. It now has air control of all movements, independent boom hoist, independent travel

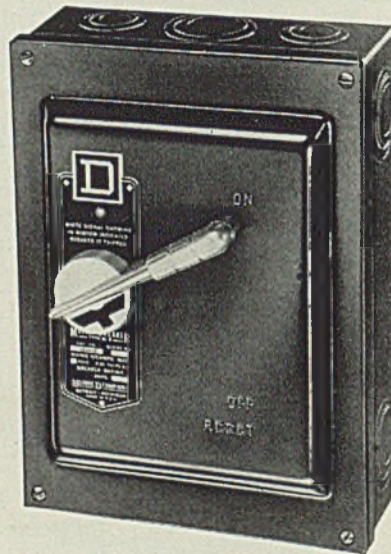


and swing motions and hook rollers. The independent boom hoist is oper-

ated by two twin-disk clutches. A brake prevents the boom from running down under heavy loads. Independent travel of the machine is affected by a twin-disk clutch, with change of direction being made through bevel gears. Also two speeds are obtained through spur gears and selective clutches. This enables the machine to make a lift, swing or travel with the load in any direction.

Multi-Breaker

■ Square D Co., 6060 Rivard street, Detroit, announces a new industrial multi-breaker for use on 230 volt alternating current systems. It is available in both 2 and 3-pole forms in capacities from 15 to 100 amperes. The enclosure is dust-resisting and the operating mechanism, including the die cast external handle, is mounted on the cover of the box so that when the cover is removed, the entire interior of the box around the breaker is left free

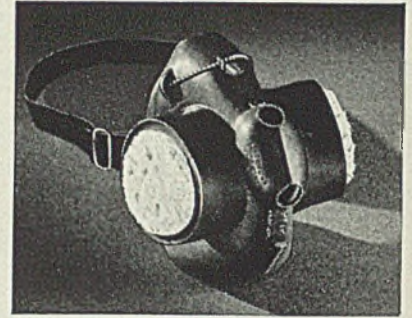


for wiring. A quick make and break mechanism also is incorporated on the cover assembly. Indication of a tripped condition of the breaker is provided by a white target signal which appears behind a glass window in the nameplate. The front operation of the breaker unit permits close ganging. A thermal element affords a time lag on momentary overloads while a magnetic trip feature causes instantaneous tripping on heavy short circuits. The box and cover are of black enameled sheet steel.

Smoke Mask

■ H. S. Cover, 98 Chippewa street, South Bend, Ind., has introduced a new smoke mask for foundrymen. Of double sponge type, it features a soft rubber mask with twin filter apertures each containing a large, fine textured sponge. The nose of

the respirator is equipped with a plastic valve that exhausts breathed air. Another feature is the new slide fastener type head band that is easy to adjust and can be quickly fitted to any head size. The



sponges, when moistened with water, keep smoke out of lungs. Unit is foldable to fit the pocket, fits low on the face and does not interfere with goggles.

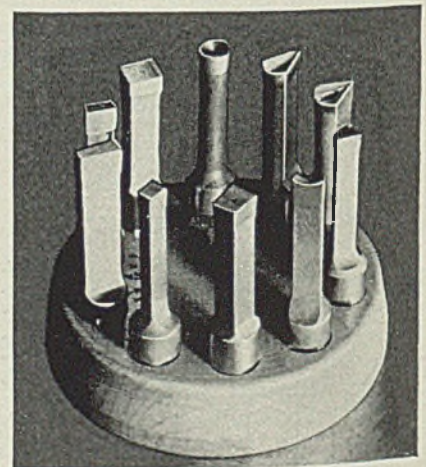
Protective Apron

■ American Optical Co., Southbridge, Mass., has placed on the market a new AO Protectocote apron, the material of which provides effective protection against acids, oil and greases.

In addition to protecting the worker's clothing, it guards his person against contact with industrial compounds and liquids that cause skin diseases and discomfort. It also resists heat and will not burn. The apron is very light in weight.

Slotting Tools

■ Experimental Tool & Die Co., 12605 Greiner, Detroit, announces an assortment of ten high speed steel slotting tools for use in conjunction with the company's Slotmaster, a slotting head that can be used on all milling machines, providing



double duty facilities. The unit also can be used as a vertical or horizontal slotter and shaper for cutting key-ways, templets, splines, internal gears, and for slotting out precision blanking dies and molds.

Nondefense Consumer Position Grows Worse

Indications point to increased suspension in civilian goods production, with resulting widespread unemployment. Regulations more stringent

■ UNDER the impact of the all-out priority system recently applied to steel in all forms some consuming plants already have been forced to suspend operations on civilian goods. Although not yet in the critical stage, indications are that such suspensions will become widespread, resulting in large unemployment during at least a temporary period in turning from civilian goods production to defense. Involved are goods made from metals in general.

Under the stringent new pig iron regulations one Southern producer finds it hereafter can ship to only about 10 per cent of its customers, who are engaged on priority business; the remaining 90 per cent are threatened with shutdowns.

The decision to cut passenger car production 26½ per cent during the four months starting Aug. 1 is a straw showing which way the wind is blowing. Last week mills analyzed their order books to determine what finished products are least involved in defense. Fewest priority orders involve wire and next fewest apply in cold-rolled sheets and strip, galvanized sheets, hot-rolled sheets and strip, tin plate, in that order. Some semifinished steel now going into wire immediately will be diverted to products such as plates, which come largely under high priority. Similar diversions will reduce the output of the other products named, excepting possibly tin plate, which, while not yet under extensive priority, will be needed in large volume for food canning.

Plate consumers hope the new regulations may result in better shipments as it is believed material for shipbuilding has been accumulated in shipyards faster than it can be fabricated and that cognizance may be taken of this and plates be released for other purposes until accumulations have been reduced.

Rating of A-3 for railroad car building material may not be sufficient to keep up production as this preference is behind a large tonnage carrying a higher rank.

Some mills specify that Form PD73 be received from customers by Sept. 1 for all orders now on books, although the priorities division has provided that this form may be furnished by Oct. 15 in connection with

orders on books before Sept. 1, on which shipments will not be completed by Oct. 15. Producers are emphasizing to customers that this form has nothing to do with priority rating, which must accompany all new orders. They also point out that mills can not accept orders in which only part is covered by priority and that separate orders must be entered.

Demoralization proceeds in the scrap market and differentials between grades has all but disappeared, melters being glad to get anything that is steel or iron. Reports of sales at \$2 to \$3 per ton over the ceiling have been received and No. 1 heavy melting steel is reported to have been sold in the Pittsburgh district at \$25 per ton, at Cleveland at \$23.50 and at Chicago at \$23.

Some form of mandatory priority to cover steel warehouse sales is expected to be announced soon to clarify the situation of secondary suppliers and stop leaks of material for less essential requirements. Warehouses have been tightening releases to civilian trade and filling higher priorities first.

Automobile production last week totaled 45,525 units, compared with 46,750 the previous week and 23,732 in the corresponding period last year.

Steel production last week advanced ½-point to 98½ per cent, changes in various areas being slight. Chicago gained 1½ points to 101½ per cent, Cleveland 3½ to 93, Cincinnati 2½ to 88 and Buffalo 2½ to 93 per cent. Detroit dropped 2 points to 92 and Wheeling 1 point to 92. Unchanged rates were as follows: Pittsburgh, 100; Youngstown, 98; New England, 90; eastern Pennsylvania, 95½; St. Louis, 98; Birmingham, 90.

Lake Superior iron ore consumption in July set a new high mark at 6,497,442 gross tons, eclipsing the previous high set in March. With this rate continued or exceeded through the winter the expected season total of 75,000,000 to 78,000,000 tons of ore would be none too much to tide over until the opening of navigation in 1942.

STEEL'S composites hold unchanged at the level prevailing for several weeks, \$56.60 for finished steel, \$38.15 for iron and steel and \$19.16 for steelworks scrap.

MARKET IN TABLOID ★

Demand

Nondefense procurement becomes serious problem.

Prices

Secondary to obtaining delivery; scrap breaks through ceiling.

Production

Gains ½-point to 98½ per cent.

COMPOSITE MARKET AVERAGES

	Aug. 23	Aug. 16	Aug. 9	One Month Ago July, 1941	Three Months Ago May, 1941	One Year Ago Aug., 1940	Five Years Ago Aug., 1936
Iron and Steel	\$38.15	\$38.15	\$38.15	\$38.15	\$38.15	\$37.70	\$33.88
Finished Steel	56.60	56.60	56.60	56.60	56.60	56.60	53.40
Steelworks Scrap . . .	19.16	19.16	19.16	19.16	19.16	18.71	14.66

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	Aug. 23,	July	May	Aug.	Pig Iron	Aug. 23,	July	May	Aug.
	1941	1941	1941	1940		1941	1941	1941	1940
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.15c	Bessemer, del. Pittsburgh	\$25.34	\$25.34	\$25.34	\$24.34
Steel bars, Chicago	2.15	2.15	2.15	2.15	Basic, Valley	23.50	23.50	23.50	22.50
Steel bars, Philadelphia	2.47	2.47	2.47	2.47	Basic, eastern, del. Philadelphia	25.34	25.34	25.34	24.34
Shapes, Pittsburgh	2.10	2.10	2.10	2.10	No. 2 fdry., del. Pgh., N.&S. Sides	24.69	24.69	24.69	23.69
Shapes, Philadelphia	2.215	2.215	2.215	2.215	No. 2 foundry, Chicago	24.00	24.00	24.00	23.00
Shapes, Chicago	2.10	2.10	2.10	2.10	Southern No. 2, Birmingham	20.38	20.38	20.38	19.38
Plates, Pittsburgh	2.10	2.10	2.10	2.10	Southern No. 2, del. Cincinnati	24.06	24.06	24.06	23.06
Plates, Philadelphia	2.15	2.15	2.15	2.15	No. 2X, del. Phila. (differ. av.)	26.215	26.215	26.215	25.215
Plates, Chicago	2.10	2.10	2.10	2.10	Malleable, Valley	24.00	24.00	24.00	23.00
Sheets, hot-rolled, Pittsburgh	2.10	2.10	2.10	2.10	Malleable, Chicago	24.00	24.00	24.00	23.00
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.05	Lake Sup., charcoal, del. Chicago	31.34	31.34	31.09	30.34
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50	Gray forge, del. Pittsburgh	24.19	24.19	24.19	23.17
Sheets, hot-rolled, Gary	2.10	2.10	2.10	2.10	Ferromanganese, del. Pittsburgh	125.33	125.33	125.33	125.33
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 3/8-inch, Pitts.	2.00	2.00	2.00	2.00

Scrap

Heavy melting steel, Pitts.	\$20.00	\$20.00	\$20.00	\$18.75
Heavy melt. steel, No. 2, E. Pa.	17.75	17.75	17.75	18.35
Heavy melting steel, Chicago	18.75	18.75	18.75	18.10
Rails for rolling, Chicago	22.25	22.25	22.25	22.00
No. 1 Cast, Chicago	20.00	21.50	21.50	16.75

Coke

Connellsville, furnace, ovens	\$6.25	\$6.25	\$5.70	\$4.75
Connellsville, foundry, ovens	7.25	7.25	6.30	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, base	3.05c
Granite City, base	3.15c
Detroit, del.	3.15c
Pacific ports	3.70c
Galvanized Sheets, No. 24	
Pittsburgh, Chicago, 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, 29 gage, per square	3.31c
Culvert Sheets	
Pittsburgh, Chicago, Gary, Birmingham, 16 gage, not corrugated, copper alloy	3.60c
Copper iron	3.90c
Pure iron	3.95c
Zinc-coated, hot-dipped, heat-treated, No. 24, Pittsburgh	4.25c
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	
	Base Deliv. Mahoning
Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less	2.80c
Chicago, base	2.90c
Worcester, base	3.00c
Detroit, del.	2.90c
Commodity C.R. Strip	
Pittsburgh, Cleveland, Youngstown, base 3 tons and over	2.95c
Worcester, base	3.35c
Cold-Finished Spring Steel	
Pittsburgh, Cleveland, base; add 20 cents for Worcester	2.80c
26-.50 Carbon	2.80c
51-.75 Carbon	4.30c

town, base, 1 ton and over, 12 inches wide and less	2.10c
Detroit, del.	2.20c
Pacific ports	2.75c
76-1.00 Carbon	6.15c
Over 1.00 Carbon	8.35c

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
Manufacturing 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
15-lb.	14.00
20-lb.	15.00
25-lb.	\$16.00
30-lb.	17.25
40-lb.	19.50

Chromium-Nickel Steels

Pittsburgh base, cents per lb.

No.	302	303	304	20% Clad
Bars	24.00	26.00	25.00	304
Plates	27.00	29.00	29.00	*18.00
Sheets	34.00	36.00	36.00	19.00
H. R. strip	21.50	27.00	23.50	
C. R. strip	28.00	33.00	30.00	

Straight Chromium Steels

Pittsburgh base, cents per lb.

No.	410	416	430	442	446
Bars	18.50	19.00	19.00	22.50	27.50
Plates	21.50	22.00	22.00	25.50	30.50
Sheets	26.50	27.00	29.00	32.50	36.50
H. R. Strip	17.00	18.25	17.50	24.00	35.00
C. R. strip	22.00	23.50	22.50	32.00	52.00

*Includes annealing and pickling.

Steel Plate

Pittsburgh	2.10c
New York, del.	2.29c-2.54c
Philadelphia, del.	2.15c
Boston, delivered	2.42c-2.57c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, Pa.	2.10c-2.35c
Sparrows Point, Md.	2.10c-2.35c
Claymont, Del.	2.10c-2.35c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast ports	2.65c
Steel Floor Plates	
Pittsburgh	3.35c
Chicago	3.35c

Gulf ports	3.70c
Pacific Coast ports	4.00c

Structural Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21 1/2c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c
Gulf ports	2.45c
Birmingham	2.10c
St. Louis, del.	2.34c
Pacific Coast ports	2.75c

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

Alloy		
S.A.E. Diff.	S.A.E. 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	
Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base	3.35c
Detroit	3.45c
Galveston, add \$0.25; Pacific Coast, \$0.50.	

Turned, Ground Shafting	
Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base (not including turning, grinding, polishing extras)	2.65c
Detroit	2.70c

Reinforcing Bars (New Billet)	
Pittsburgh, Chicago, Gary, Cleveland, Birm., Sparrows Point, Buffalo, Youngstown, base	2.15c
Gulf ports, dock	2.50c

All-rail, Houston from Birmingham	
Pacific ports, dock	2.80c
All-rail from Chicago	3.25c
Detroit, del.	2.25c

Reinforcing Bars (Rail Steel)	
Pittsburgh, Chicago, Gary,	

Cleveland, Birm., base	2.15c
Gulf ports, dock	2.50c
All-rail, Houston from Birmingham	2.59c
Pacific ports, dock	2.80c
All-rail from Chicago	3.25c
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	
(Per Pound)	\$2.55
Polished fence staples	2.55c
Annealed fence wire	3.05c
Galv. fence wire	3.40c
Woven wire fencing (base C. L. column)	
Single loop bale ties, (base C.L. column)	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)	
Bright bess., basic wire	2.60c
Galvanized wire	2.60c
Spring wire	3.20c
Worcester, Mass., \$2 higher on bright basic and spring wire.	

Cut Nails

Carload, Pittsburgh, keg	\$3.85
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Alloy Plates (Hot)

Pittsburgh, Chicago. Coatesville, Pa.	3.50c
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Rails, Fastenings

(Gross Tons)	
Standard rails, mill	\$40.00
Relay rails, Pittsburgh 20-100 lbs.	32.50-35.50
Light rails, billet qual.	
Pitts., Chicago, B'ham.	\$40.00
Do., rerolling quality	39.00
Cents per pound	
Angle bars, billet, mills	2.70c
Do., axle steel	2.85c
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	
1/2 x 6 and smaller	65 1/2 off
Do., 3/4 and 1 x 6-in.	
and shorter	63 1/2 off
Do., 3/4 to 1 x 6-in. and shorter	61 off
1 1/2 and larger, all lengths	59 off
All diameters, over 6-in.	
long	59 off
Tire bolts	50 off

Step 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.	
1/2-inch and less	62 64
3/4-inch	59 60
1 1/2-inch	57 58
1 1/2 and larger	56
Hexagon Cap Screws	
Upset 1-in., smaller	64 off

Square Head Set Screws	
Upset, 1-in., smaller	71 off
Headless set screws	60 off

Piling

Pitts., Chgo., Buffalo	2.40c
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Rivets, Washers

F.o.b. Pitts., Cleve., Chgo., Bham.	
Structural	3.75c
1/2-inch and under	65-5 off
Wrought 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-hard-		
Carb. Ext. 18.00	ening	24.00	
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	77.00
18.00	4	3	87.00
1.50	4	1	54.00
	4	2	54.00
5.50	4	1.50	57.50
5.50	4.50	4	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	Char-coal Iron
1 1/2" O.D.	13	\$ 9.72	\$23.71
1 3/4" O.D.	13	11.06	22.93
2" O.D.	13	12.38	19.35
2 1/4" O.D.	13	13.79	21.68
2 1/2" O.D.	12	15.16	
2 3/4" O.D.	12	16.58	26.57
3" O.D.	12	17.54	29.00
3 1/2" O.D.	12	18.35	31.36
3 3/4" 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
1 1/4" O.D.	13	9.27	10.67
1 1/2" O.D.	13	10.23	11.79
1 3/4" O.D.	13	11.64	13.42
2" O.D.	13	13.04	15.03
2 1/4" O.D.	13	14.54	16.76
2 1/2" O.D.	12	16.01	18.45
2 3/4" O.D.	12	17.54	20.21
3" O.D.	12	18.59	21.42
3 1/2" O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4 1/2" 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 2 1/2 and 1 1/2 less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld Steel			
In.	Blk.	Galv.	
1/2	63 1/2	51	
3/4	66 1/2	55	
1-3	68 1/2	57 1/2	
Iron			
3/4	30	10	
1-1 1/4	34	16	
1 1/2	38	18 1/2	
2	37 1/2	18	
Lap Weld Steel			
2	61	49 1/2	
2 1/2-3	64	52 1/2	
3 1/2-6	66	54 1/2	
7 and 8	65	52 1/2	

Iron	
2	30 1/2 12
2 1/2-3 1/2	31 1/2 14 1/2
4	33 1/2 18
4 1/2-8	32 1/2 17
9-12	28 1/2 12

Line Pipe, Plain Ends	
Steel	
1 to 3, butt weld	71 1/2
2, lap weld	64
2 1/2 to 3, lap weld	67
3 1/2 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	
Std. Htgs., 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, Youngs., Sparrows Point Buffalo, Canton, Chicago	34.00
Detroit, delivered	36.00

Wire Rods	
Pitts., Cleveland, Chicago, Birmingham No. 5 to 3/4-inch incl. (per 100 lbs.)	\$2.00
Do., over 3/4 to 1 1/4-in. incl.	2.15
Worcester up \$0.10; Galveston up \$0.25; Pacific Coast up \$0.50.	

Skelp	
Pitts., Chi., Youngstown, Coatesville, Sparrows Pt.	1.90c

Shell Steel	
Pittsburgh, Chicago, base, 1000 tons of one size, open hearth	\$52.00
3-12-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 xylo	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, ball.	
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.	Malle-able	Basic	Besse-mer
Bethlehem, Pa.	\$25.00	\$25.50	\$24.50	\$26.00
Birmingham, Ala.	20.38	20.00	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	23.50	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	24.50
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	22.00	22.00	22.00
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrow's Point, Md.	24.50	24.50	24.50	25.00
Swedeland, Pa.	25.00	25.00	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

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

Delivered from Basing Points:

Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham	25.61	25.61	25.11	26.11
Boston from Birmingham	25.12	25.12	24.62	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	27.00	28.00
Canton, O. from Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	24.22	24.22	23.72	24.22
Cincinnati from Hamilton, O.	24.44	25.11	24.61	25.11
Cincinnati from Birmingham	24.06	24.06	23.06	24.06
Cleveland from Birmingham	24.12	24.12	23.12	24.12
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	25.94
Milwaukee from Chicago	25.10	25.10	24.60	25.60
Muskegon, Mich., from Chicago, Toledo or Detroit	27.19	27.19	26.69	27.19
Newark, N. J., from Birmingham	26.15	26.15	25.65	26.15
Newark, N. J., from Bethlehem	26.53	27.03	26.03	27.03
Philadelphia from Birmingham	25.46	25.46	24.96	25.46
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	25.84
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.	Malle-able	Basic	Besse-mer
Saginaw, Mich., from Detroit	26.31	26.31	25.81	26.81
St. Louis, northern	24.50	24.50	24.00	24.50
St. Louis from Birmingham	24.50	24.50	23.62	24.50
St. Paul from Duluth	26.63	26.63	26.13	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

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 silvery, 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	Ladle Brick (Pa., O., W. Va., Mo.)
Super Quality	Dry press \$31.00
Pa., Mo., Ky. \$64.60	Wire cut 29.00
First Quality	Magnesite
Pa., Ill., Md., Mo., Ky. 51.30	Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk 22.00
Alabama, Georgia 51.30	net ton, bags 26.00
New Jersey 56.00	Basic Brick
Second Quality	Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa. Chrome brick \$54.00
Pa., Ill., Ky., Md., Mo. 46.55	Chem. bonded chrome 54.00
Georgia, Alabama 38.00	Magnesite brick 76.00
New Jersey 49.00	Chem. bonded magnesite 65.00
Ohio	
First quality 43.00	Fluorspar
Intermediate 36.10	Washed gravel, duty pd., tile, net ton \$25.00-\$26.00
Second quality 36.00	Washed gravel, f.o.b. Ill. Ky., net ton, carloads, all rail. 21.00
Malleable Bung Brick	Do. barge 21.00
All bases \$59.85	No. 2 lump 21.00
Silica Brick	
Pennsylvania 551.30	
Joliet, E. Chicago 58.90	
Birmingham, Ala. 51.30	

Ferrolloy 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.	Do., ton lots 11.75c Do., less-ton lots 12.00c less than 200 lb. lots 12.25c 67-72% low carbon: Car-loads ton 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	Ferromanganese, 15-18%, tl., 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	Silicon Metal, 1% iron, contract, carlots, 2 x ¼-in., lb. 14.50c Do., 2% 13.00c Spot ¼c higher
Spiegeleisen, 19-21% dom. Palmerston, Pa., spot 36.00	Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95	15-18% tl., 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	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
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.	Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80	Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c Do., ton lots 8.00c Do., less-ton lots 8.50c Spot ¼c lb. higher	Manganese Briquets, contract carloads, bulk freight allowed, lb. 5.50c Ton lots 6.00c Less-ton lots 6.25c Spot ¼c higher
Silicomanganese, c.l., 2½ per cent carbon 118.00 1¼% carbon 128.00 Contract ton price \$12.50 higher; spot \$5 over contract.	Molybdenum Oxide, lb. Molyb. cont., 5-20-lb. containers, f. o. b., Washington, Pa., lb. 0.80	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	Zirconium Alloy, 12-15%, contract, carloads, 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
Ferrotungsten, stand., lb. con. del. cars 1.90-2.00	Ferrotitanium, 40-45%, lb., con. tl., 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	Tungsten Metal Powder, 98-99 per cent, per lb., depending upon quantity \$2.50-2.60	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
Ferrovandium, 35 to 40%, lb., cont. 2.70-2.80-2.90	Ferrocolumbium, 50-60% contract, lb. con. col., f.o.b. Niagara Falls \$2.25 Do., less-ton lots 2.30 Spot is 10c higher	Vanadium Pentoxide, contract, lb. contained \$1.10 Do., spot 1.15	Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant 80.00c
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	Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill. 0.80	Chromium Metal, 93% cr., contract, lb. con. chrome, ton lots 80.00c Do., spot 85.00c 88% chrome, cont. tons 79.00c Do., spot 84.00c	

WAREHOUSE STEEL PRICES

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

	Soft Bars			Plates	Structural	Floor	Sheets		Galv.	Cold Rolled	Cold Drawn Bars		
	Bands	Hoops	Over	Shapes	Plates	Hot Rolled	Cold Rolled	No. 24	Strip	Carbon	S.A.E. 2300	S.A.E.	
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	3.53	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 \$4.02 1/2 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	266.50	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	8 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	15 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 shapes	3.17c	17	12 0 1/2
Ship plates	2.77c	15	8 0 1/2
Boiler plates	2.91c	16	3 0 1/2
Sheets, black, 24 gage, 4-ton lots and over	3.06c	17	0 6 1/2
Sheets, galvanized 24 gage, corrugated, 4-ton lots & over	4.10c	22	15 0
Plain wire, mild drawn, catch weight coils, 2-ton lots and over	4.70c	26	2 6
Bands and strips, hot-rolled	4.28c	23	15 0
(a) del. Middlesbrough	3.30c	18	7 0

15c on certain conditions. 25c rebate to approved customers. †Rebate

Ores

Spanish, No. African basic, 50 to 60%	Nom.
Lake Superior Iron Ore	Chinese wolframite, net ton, duty pd. \$24.00-25.00
Gross ton, 51 1/4%	Brazil iron ore, 68-69%, ord. 7.50c
Lower Lake Ports	Low phos. (.02 max.) 8.00c
Old range bessemer	4.75
Mesabi nonbessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer	4.60
	F.O.B. Rio Janeiro.
	Scheelite, imp. 23.50-24.00
	Chrome ore, Indian, 48% gross ton.
Eastern Local Ore	Manganese Ore
Cents, unit, del. E. Pa.	Including war risk but not duty, cents per unit cargo lots.
Foundry and basic 56-63%, contract..	10.00
	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
Foreign Ore	Molybdenum
Cents per unit, c.i.f. Atlantic ports	
Manganiferous ore, 45-55% Fe., 6-10%	Nom.
Mang.	Nom.
N. African low phos.	Nom.
	Sulphide conc., lb., Mo. cont., mines. \$0.75

IRON AND STEEL SCRAP PRICES

Maximum Prices Announced June 18 by Office of Price Administration and Civilian Supply (Gross Tons)

	Pittsburgh, Weirton, Steubenville(a)	Youngs- town, Canton, Warren, Sharon	Chicago	Beth- lehem	*East. Pa.	Spar- rows Pt.	Cleve- land	Buffalo	Ashland, Ky., Portsmouth, Middle- town, O.	Kokomo, Ind.
No. 1 heavy melting	\$20.00	\$20.00	\$18.75	\$18.25	\$18.75	\$18.75	\$19.50	\$19.25	\$19.50	\$18.25
No. 1 hyd. comp. black sheets	20.00	20.00	18.75	18.25	18.75	18.75	19.50	19.25	19.50	18.25
No. 2 heavy melting	19.00	19.00	17.75	17.25	17.75	17.75	18.50	18.25	18.50	17.25
Dealer No. 1 bundles	19.00	19.00	17.75	17.25	17.75	17.75	18.50	18.25	18.50	17.25
Dealer No. 2 bundles	18.00	18.00	16.75	16.25	16.75	16.75	17.50	17.25	17.50	16.25
Mixed borings and turnings	15.25	15.25	14.00	13.50	14.00	14.00	14.75	14.50	14.75	14.25
Machine shop turnings**	15.50	15.50	14.25	13.75	14.25	14.25	15.00	14.75	15.00	14.50
Shovel turnings	16.50	16.50	15.25	14.75	15.25	15.25	16.00	15.75	16.00	15.50
No. 1 busheling	19.50	19.50	18.25	17.75	18.25	18.25	19.00	18.75	19.00	17.75
No. 2 busheling	15.50	15.50	14.25	13.75	14.25	14.25	15.00	14.75	15.00	13.75
Cast iron borings	15.75	15.75	14.50	14.00	14.50	14.50	15.25	15.00	†15.25	14.00
Uncut structurals and plate	19.00	19.00	17.75	17.25	17.75	17.75	18.50	18.25	18.50	17.25
No. 1 cupola	21.00	21.00	20.00	22.50	23.00	22.00	22.00	20.00	21.00	20.00
Heavy breakable cast	19.50	19.50	18.50	21.00	21.50	21.00	20.50	18.50	19.50	18.50
Stove plate	19.00	19.00	17.00	18.00	18.50	18.00	18.00	19.00	17.50	16.00
Low phos. billet, bloom crops	25.00	25.00	23.75	23.25	23.75	23.75	24.50	24.25	23.50	23.75
Low phos. bar crops and smaller	23.00	23.00	21.75	21.25	21.75	21.75	22.50	22.25	21.50	21.75
Low phos. punch, plate scrap***	23.00	23.00	21.75	21.25	21.75	21.75	22.50	22.25	21.50	21.75
Machinery cast cupola size††	22.00	22.00	21.00	23.50	24.00	23.50	23.00	21.00	22.00	21.00
No. 1 machine cast, drop broken, 150 pounds and under	22.50	22.50	21.50	24.00	24.50	24.00	23.50	21.50	22.50	21.50
Clean auto cast	22.50	22.50	21.50	24.00	24.50	24.00	23.50	21.50	22.50	21.50
Punchings and plate scrap†††	22.00	22.00	20.75	20.25	20.75	20.75	21.50	21.25	20.50	20.75
Punchings and plate scrap§§	21.00	21.00	19.75	19.25	19.75	19.75	20.50	20.25	19.50	19.75
Heavy axle and forge turnings	19.50	19.50	18.25	17.75	18.25	18.25	19.00	18.75	18.00	18.25
Med. heavy elec. furnace turnings	18.00	18.00	16.75	16.25	16.75	16.75	17.50	17.25	16.50	16.75

	St. Louis	Toledo, O.	Detroit	Duluth	Birming- ham	*Alabama City, Ala., Atlanta	Chat- tanooga	Radford, Va.	New Eng- land†	Pacific Coast‡
No. 1 heavy melting	\$17.50	\$17.50	\$17.85	\$18.00	\$17.00	\$17.00	\$17.00	\$17.00	\$16.50	\$14.50
No. 1 hyd. comp. black sheets	17.50	17.50	17.85	18.00	17.00	17.00	17.00	17.00	16.50	14.50
No. 2 heavy melting	16.50	16.50	16.85	17.00	16.00	16.00	16.00	16.00	15.50	13.50
Dealer No. 1 bundles	16.50	16.50	16.85	17.00	16.00	16.00	16.00	16.00	15.50	13.50
Dealer No. 2 bundles	15.50	15.50	15.85	16.00	15.00	15.00	15.00	15.00	14.50	12.50
Mixed borings and turnings	12.75	13.10	13.10	13.10	12.25	12.25	12.25	12.25	11.75	9.75
Machine shop turnings	13.00	13.35	13.35	13.35	15.50	15.00	15.00	15.00	14.50	10.00
Shoveling turnings	14.00	14.35	14.35	14.35	16.50	16.00	16.00	16.00	15.50	11.00
No. 1 busheling	17.00	17.00	17.35	17.50	16.50	16.50	16.50	16.50	16.00	14.00
No. 2 busheling	13.00	13.00	13.35	13.50	12.50	12.50	12.50	12.50	12.00	10.00
Cast iron borings	13.25	13.60	13.60	13.75	12.75	12.75	12.75	12.75	12.25	10.25
Uncut structurals and plate	18.50	18.50	18.85	17.00	16.00	16.00	16.00	16.00	15.50	13.50
No. 1 cupola	20.00	20.00	20.35	19.00	20.00	20.00	20.50	21.00	22.00	18.00
Heavy breakable cast	18.50	18.50	18.85	17.50	18.50	18.50	18.50	18.50	20.50	17.00
Stove plate	17.00	15.60	14.10	16.00	17.00	17.00	17.50	18.00	17.50	14.00
Low phos. billet and bloom crops	22.50	22.50	22.85	23.00	22.00	22.00	22.00	22.00	22.00	19.50
Low phos. bar crops and smaller	20.50	20.50	20.85	21.00	20.00	20.00	20.00	20.00	20.00	19.50
Low phos. punch. and plate scrap***	20.50	20.50	20.85	21.00	20.00	20.00	20.00	20.00	20.00	17.50
Machinery cast cupola size††	21.00	21.00	21.35	20.00	21.00	21.00	21.50	22.00	23.00	19.00
No. 1 machine cast, drop broken, 150 pounds and under	21.50	21.50	21.85	20.50	21.50	21.50	22.00	22.50	23.50	19.50
Clean auto cast	21.50	21.50	21.85	20.50	21.50	21.50	22.00	22.50	23.50	19.50
Punchings and plate scrap†††	19.50	19.50	19.85	20.00	19.00	19.00	19.00	19.00	19.00	16.50
Punchings and plate scrap§§	18.50	18.50	18.85	19.00	18.00	18.00	18.00	18.00	18.00	15.50
Heavy axle and forge turnings	17.00	17.00	17.35	17.50	16.50	16.50	16.50	16.50	16.50	14.00
Medium heavy elec. furnace turnings	15.50	15.50	15.85	16.00	15.00	15.00	15.00	15.00	15.00	12.50

*Claymont, Del., Coatesville, Conshohocken, Phoenixville, Harrisburg, Pa. †Worcester, Mass.; Bridgeport, Conn.; Phillipsdale, R. I. ‡Los Angeles, San Francisco, Portland, Seattle; *** 3/4-inch and heavier, cut 12 inches and under; ††may include clean agricultural cast; ††under 3/4-inch to 1/2-inch, cut 12 inches and under; §§under 1/2-inch to No. 12 gage, cut 12 inches and under. **Alloy, W. Va., base \$17.60. †Base price at Portsmouth and Ashland; Middletown 25 cents less. †Add \$1.75 at Pittsburgh. ‡Atlanta base only on Nos. 1 and 2 H.M. steel, No. 1 comp. sheets and Nos. 1 and 2 dealer bundles. †Also base prices at Minneapolis and St. Paul. †Add \$2 at Minnequa, Colo.

Maximum Prices for Iron and Steel Scrap Originating from Railroads

	Pittsburgh, Wheeling, Steubenville	Youngs- town, Canton, Sharon	Chicago	Kokomo, Ind.	*East. Pa.	Spar- rows Pt.	Cleve- land	Ash- land, Ky., Portsmouth, Middle- town, O.
No. 1 Railroad grade heavy melting steel	\$21.00	\$21.00	\$19.75	\$19.25	\$19.75	\$19.75	\$20.50	\$20.50
Scrap rails	22.00	22.00	20.75	20.25	20.75	20.75	21.50	21.50
Re-rolling quality rails (a)	23.50	23.50	22.25	21.75	22.25	22.25	23.00	23.00
Scrap rails 3 feet and under	24.00	24.00	22.75	22.25	22.75	22.75	23.50	23.50
Scrap rails 2 feet and under	24.25	24.25	23.00	22.50	23.00	23.00	23.75	23.75
Scrap rails 18 inches and under	24.50	24.50	23.25	22.75	23.25	23.25	24.00	24.00

	Buffalo	St. Louis	Kansas City	Detroit	Duluth	Birming- ham	Pacific Coast‡
No. 1 Railroad grade heavy melting steel	\$20.25	\$18.50	\$17.00	\$18.85	\$19.00	\$18.00	\$15.50
Scrap rails	21.25	19.50	18.00	19.85	20.00	19.00	16.50
Re-rolling quality rails (a)	22.75	21.00	19.50	21.35	21.50	20.50	18.00
Scrap rails 3 feet and under	23.25	21.50	20.00	21.85	22.00	21.00	18.50
Scrap rails 2 feet and under	23.50	21.75	20.25	22.10	22.25	21.25	18.75
Scrap rails 18 inches and under	23.75	22.00	20.50	22.35	22.50	21.50	19.00

*Philadelphia, Wilmington, Del.; ‡Los Angeles, San Francisco, Seattle.

NOTE: Where the railroad maker of scrap operates in two or more of the consuming points named above, the highest of the maximum prices set out above for such basing points shall be the maximum price at consumer's plant at any point on the railroad's line. (a) Re-laying quality \$5 higher.

Sheets, Strip

Sheets & Strip Prices, Page 94

Diversion of a larger percentage of semifinished steel to finished products more heavily involved in the defense program is in sight, thereby making it more certain that civilian consumers will have a tough time of it soon.

Certain steelmakers whose overall business is typical of the industry have analyzed their order books to determine the extent to which priorities affect various finished steel products. Wire orders, it has been found, carry the fewest priorities, with the result that at least a certain portion of the steel now going into wire will be diverted to other products. Next fewest priority orders, in the order named, apply in cold-rolled sheets and strip, galvanized sheets, hot-rolled sheets and strip, tin plate.

Sheet demand continues heavy from all sources and consumers are seeking to place further tonnage and to obtain some sort of delivery promise. The latter is difficult as sheetmakers find their schedules constantly disrupted by high preference orders causing revision, pushing back orders with lower priority. Automobile builders are seeking sufficient material to keep up their output at the agreed rate of 80 per cent of last year's production.

Some sheet mills found shipments in July were more than half for defense purposes, an increase over June and a further growth is indicated for August. Mills attempting to make up fourth quarter schedules find it almost impossible to apportion tonnage for nondefense buyers with any certainty.

Galvanized sheet production continued last week at about 53 per cent of capacity. Buyers of this grade are pressing less heavily for delivery as substitutes are being used in such cases as it has been found feasible.

New England stripmakers find decline in buying of narrow cold-rolled strip is offset by heavier volume with preference rating, and while the ratio varies it has been close to 50 per cent in recent weeks. Hot-rolled strip deliveries are less certain and rerollers are dipping into reserves to produce cold-rolled. Strip-rolling equipment shows the effect of continuous operation at a high rate and delays for repairs are more frequent.

Plates

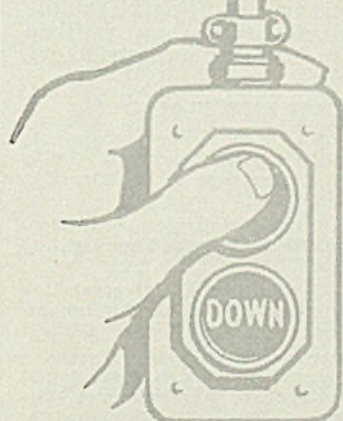
Plate Prices, Page 94

Plate deliveries to miscellaneous users may be improved when the full priority plan is in effect, especially in heavy plates. It is believed shipments to shipbuilders have been larger than they could use currently and that inventory has been accumulated in many instances. The same situation is said to exist also in the case of tankbuilders and in some instances non receipt of other material on schedule has delayed fabrication of plates.

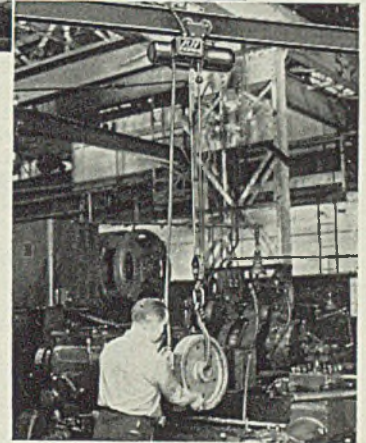
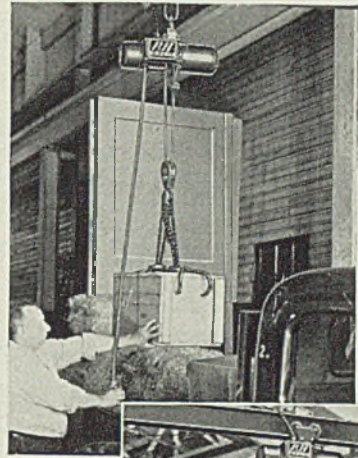
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★ The lightest weight push button handling only the control circuit — not the full motor current. No expensive replacements if damaged. Also permits simplified limit switch, again handling only auxiliary current . . . the same as on all heavy duty electric hoists and cranes.

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inventories will play an important part in determining delivery and this may result in smaller shipments to consumers having ample supply, releasing tonnage for other users not so well situated.

Railroad car builders find their preference rating falls short of providing them as much material, largely plates, as they need to keep up with car delivery promises. It develops that higher preferences apply to so large a volume of steel that they are far from being satisfied with their shipments.

Meanwhile, producers and users of plates are studying the all out priority regulations and handling blanks to be filed under the new rules. Mills are receiving a flood of inquiries as to delivery dates but are unable to give promises as precedence is governed by OPM and frequently orders are given to advance certain work, even ahead of higher preference rating. This pushes back other work so that promised delivery can not be depended on.

PLATE CONTRACTS PLACED

72,000 tons, thirty C-3 type cargo vessels for United States Maritime Commission, to Seattle-Tacoma Shipbuilding Corp., Tacoma, Wash., placed with various plate mills.

140 tons, five 100-foot tugs for navy, Pacific Coast, to Pacific Coast Engineering Co., Alameda, Calif.

PLATE CONTRACTS PENDING

220 tons, 51 1/2-inch Cedar river pipe line; Hydraulic Supply Mfg. Co., Seattle; low; bids rejected by Seattle; new bids to be called when materials priority is established.

175 tons, 500,000-gallon elevated water storage tank, navy yard, Charleston, S. C.; bids Aug. 22 to public works officer, yard.

150 tons, 3806 feet, 22-inch water line, electrically welded, for East Marginal Way, Seattle; bids Aug. 28.

Unstated, 115 underground tanks, 5000 gallons capacity each, 50 for Mare Island, Calif., 40 for Charleston, S. C., and 25 for New York navy yard; bids to navy Sept. 1.

Bars

Bar Prices, Page 95

Large purchases of cold-drawn, alloy and carbon steel bars by government arsenals continue in the East, heavy tonnages for Springfield and Watertown, Mass., supplemented by sustained buying by the Picatinny shops, Dover, N. J. Republic Steel Corp., Cleveland, has booked 1430 tons of cold-drawn bars for Picatinny and quotations on 540 tons were rejected earlier. Wyckoff Drawn Steel Co., Pittsburgh, took 250 tons of chromium-molybdenum bars recently and Crucible Steel Co. of America, New York, booked 125 tons of alloy material at 6.9225c, delivered.

Automotive industries are pressing for deliveries of bars, as well as other steel, to reach 80 per cent of last season's production. The government is seeking to reduce output even further.

Procurement of bars from warehouses has become difficult, even under priority as shipments to suppliers are not sufficient to keep up

assortments, which are much depleted in most cases. An increasing proportion of bar purchases from this source carry high priority and as a result civilian buying has little chance of being accepted. An order covering warehouses is expected shortly and may ease the situation somewhat.

Pipe

Pipe Prices, Page 95

Line pipe demand is steady with new feeder lines being placed and large tonnage for main lines impending. Valve and fittings manufacturers have idle capacity and would welcome additional pipe line business, which would carry top priority.

Cast iron pipe production is as large as pig iron supply will allow and practically all current business booked has priority rating. Several lots for Panama and Atlantic bases have been booked. Municipal buying has slackened because of uncertainty of obtaining shipment and some prospective lines have been held in abeyance. Completion of various military and defense projects within the next few months is relied on to relieve the heavy demand for soil and pressure pipe.

Standard pipe production has been delayed somewhat by inability of non-integrated makers to obtain sufficient skelp. Galvanized pipe output has been increased slightly as zinc supplies have eased, although still at only about 50 per cent of capacity. There is little probability of any substantial change in this situation.

Standard pipe shipments to warehouses have dropped slightly as direct buying under preference ratings increased. While a substantial part of warehouse buying also carries preference rating, larger jobs are being placed direct and reduce the quantity available for secondary markets.

Practically all mechanical tubing is going to defense purposes and the same is true of pressure tubing, even the A-3 rating on railroad equipment bringing unsatisfactory delivery.

CAST PIPE PLACED

3664 tons, 4 to 8-inch, east bay municipal utility district, Oakland, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

1000 tons, 4 to 16-inch, San Francisco, to United States Pipe & Foundry Co., Burlington, N. J.

1000 tons, 2 to 16-inch, universal, for naval air bases, Alaska, to Marckmann & Williams, Seattle; for Central Foundry Co.

500 tons, defense projects in Puget Sound area, universal, to Marckmann & Williams, Seattle, for Central Foundry Co.

CAST PIPE PENDING

1550 tons, 20-inch, cement-lined, Panama, schedule 5402; bids in.

650 tons, 6 to 24-inch, Class 150 and 250, San Diego, Calif.; United States Pipe & Foundry Co., Burlington, N. J., low.

300 tons, Stone Way, Forty-fourth ave. N. E. and Sand Point Way improvements, Seattle, 6 to 12-inch; bids in to

Seattle board of public works.

214 tons, 6-inch, Class 250, Burbank, Calif., United States Pipe & Foundry Co., Burlington, N. J., low.

180 tons, 6 and 8-inch and fittings, for District 4, Yakima, Wash.; bids to G. D. Hall, engineer, Aug. 26.

150 tons, 8-inch, Class 150, stock and replacement, Seattle; H. G. Purcell, for U. S. Pipe & Foundry Co., Burlington, N. J., low.

STEEL PIPE PLACED

330 tons, 30-inch steel pipe for water bureau, Philadelphia, to American Rolling Mill Co., Middletown, O.

Unstated tonnage, 200 16-foot sections, 20-inch i.d. steel shore pipe, U. S. engineer, Galveston, Tex., to Dedman Foundry & Machine Co., Houston, Tex.; inv. 343.

Unstated tonnage, 100 16-foot lengths, 18-inch i.d. shore pipe, U. S. engineer, Washington, to Lancaster Iron Works Inc., Lancaster, Pa.; serial 5.

Rails, Cars

Track Material Prices, Page 95

Slow deliveries of steel and castings are delaying production of freight cars somewhat and builders are behind the schedule set several weeks ago. Some relief was afforded by the priority granted recently but so much other steel bears higher preference that car material is being shipped in less volume than desired. Shops are being operated at the highest rate possible in view of material supply.

Class 1 railroads had 86,416 freight cars on order Aug. 1, compared with 19,756 a year ago, the Association of American Railroads reports. The same roads had 603 locomotives on order Aug. 1, compared with 168 at the same time last year. In seven months this year the railroads put in service 42,243 cars, compared with 40,416 last year and 323 locomotives compared with 201.

Chicago commissioner of subways and highways has asked bids on about 4100 tons of steel rails for the city's subway, to close Sept. 11. Included is 1270 tons of contact rail of 145-pound section. B-1 priority rating has been given the subway, to be used in case material could not be obtained otherwise.

LOCOMOTIVES PLACED

Belt Railroad, Chicago, one 1000-horsepower diesel-electric, to American Locomotive Co., New York.

Chicago, Milwaukee, St. Paul & Pacific, two 44-ton diesel-electric switchers, to General Electric Co., Schenectady, N. Y.

Raritan Arsenal, N. J., one 45-ton diesel-electric, to General Electric Co., Schenectady, N. Y.

Union Pacific, twenty-five 1000-horsepower diesel switching locomotives, to Electro Motive Corp., La Grange, Ill.; deliveries six per month, beginning in April, 1942.

U. S. Army, ordnance plant, Iowa, two 44-ton diesel-electrics, to General Electric Co., Schenectady.

CAR ORDERS PLACED

E. I. du Pont de Nemours Co., 100 tank cars, 11,000-gallon capacity, to American Car & Foundry Co., New York.

U. S. Army, engineers, three dump cars.

to Western-Austin Co., Aurora, Ill.
 War Department, 29 forty-ton fire-control cars, to Greenville Car Co., Greenville, Pa.

RAIL ORDERS PLACED

4800 tons, rails and fastenings, estimated, Panama, to Darby Products of Steel Plate Corp., Kansas City, Mo.

BUSES BOOKED

Twin Coach Co., Kent, O.: Fifty-two 40-passenger for New York City Transit System, Brooklyn, N. Y.; thirteen 44-passenger for Surface Transportation Corp., New York; five 32-passenger for New York State Railways, Utica, N. Y.; six 30-passenger for Erie Coach Co., Erie, Pa.

Wire

Wire Prices, Page 95

Wire producers are rescheduling their orders under the priority regulation and delivery dates on some lots are being deferred beyond early promises. Complete revamping of schedules will require several weeks. In some cases wire orders carry priority on more than 50 per cent of bookings and wire rope makers find it as high as 80 per cent.

Automobile builders are not placing much new tonnage but are pressing for delivery on old orders. Some business is being held back from formal entry on books until defense business is cared for.

Consumer inventory appears unbalanced, some having barely two weeks' supply and others sufficient for the remainder of the year.

Structural Shapes

Structural Shape Prices, Page 95

Structural steel inquiry, except for defense work, has declined, apparently because of inability to place civilian tonnage, under the priorities plan. Fabricators are pressed for defense shipments and shops are working at high speed. A number of current projects are in doubt as to priority. Chicago will ask bids this week for the Canal street bridge and a priority is expected to be granted.

SHAPE CONTRACTS PLACED

7500 tons, sub-assembly shop, drydocks five and six, navy yard, Brooklyn, to Bethlehem Steel Co.; bids Aug. 22.

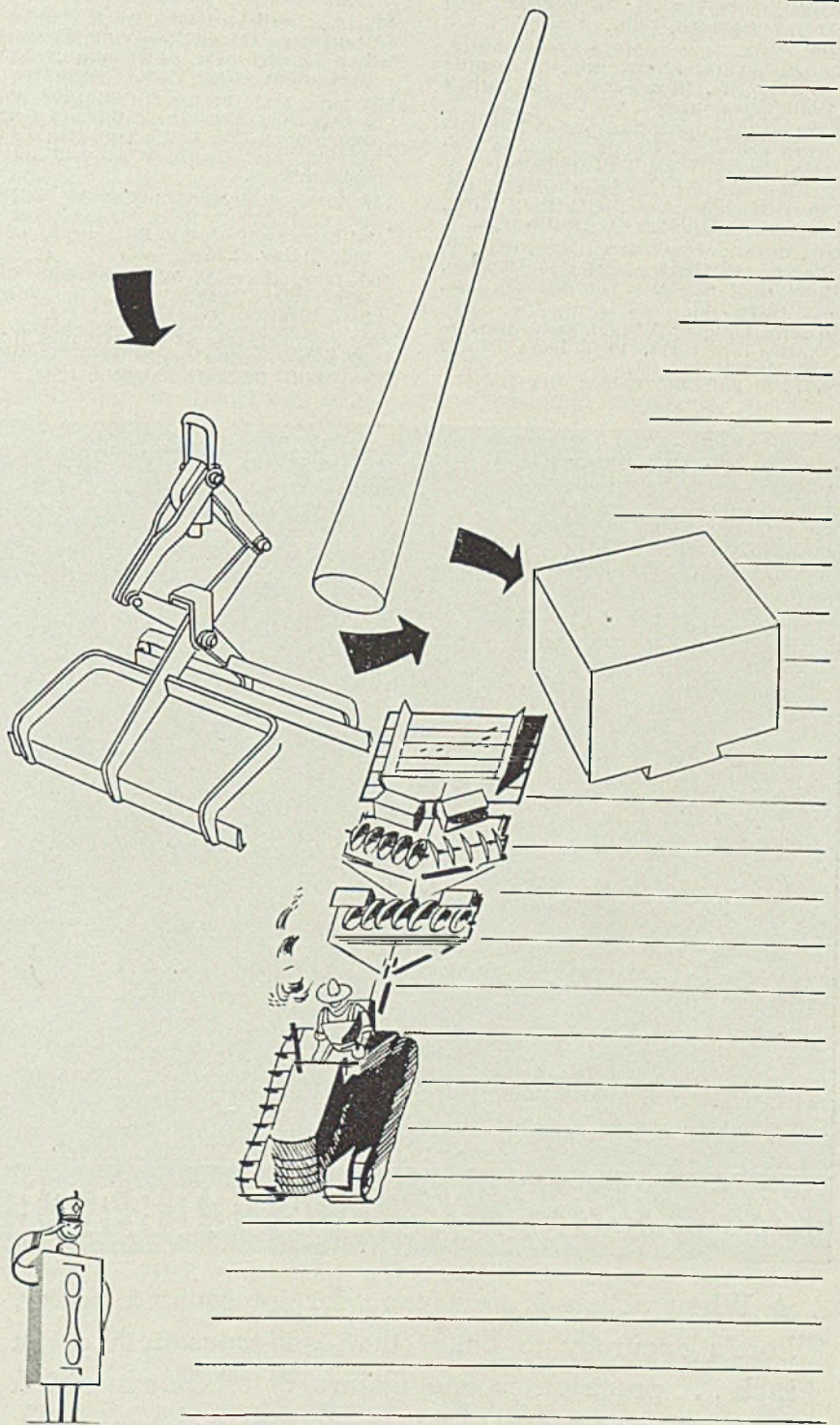
5000 tons, airplane repair building, Rome, N. Y., to Harris Structural Steel Co., Plainfield, N. J.; Turner Construction Co., New York, contractor.

1825 tons, depot supply building No. 1, Rome, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; Turner Construction Co., New York, contractor, previously reported as 1750 tons.

SHAPE AWARDS COMPARED

	Tons
Week ended Aug. 23	25,160
Week ended Aug. 16	21,057
Week ended Aug. 9	11,195
This week 1940	23,819
Weekly average, 1941	29,345
Weekly average, 1940	21,326
Weekly average, July, 1941	26,273
Total to date, 1940	725,081
Total to date, 1941	1,027,088

Includes awards of 100 tons or more.



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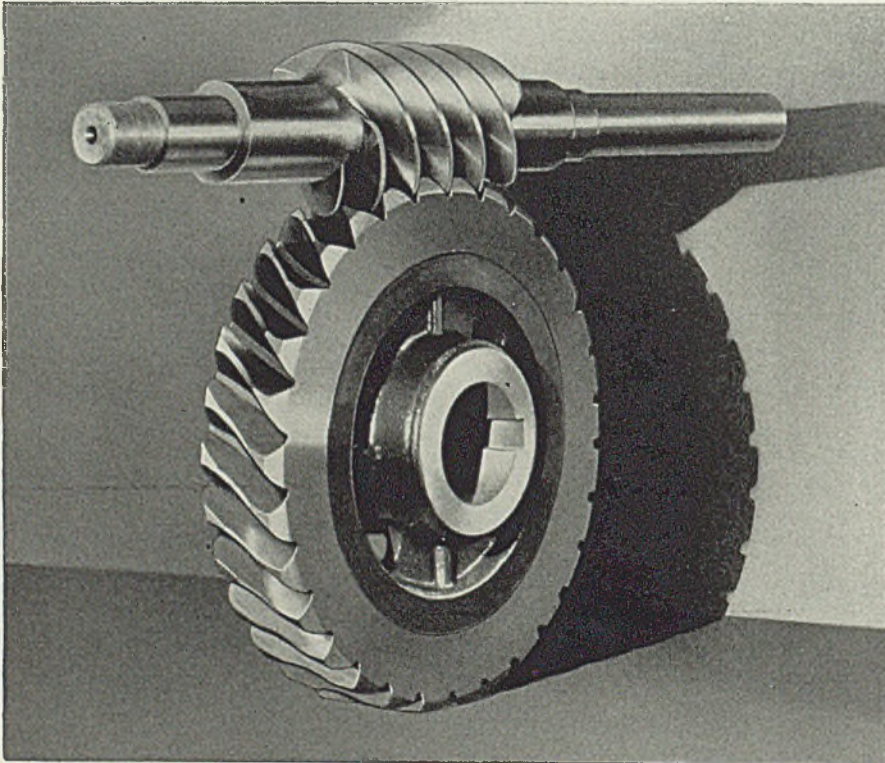


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1200 tons, 14 units, McClelland Field, Sacramento, Calif., to Herrick Iron Works, Oakland, Calif.
 1005 tons, six double warehouses, Augusta arsenal, Georgia, to Ingalls Iron Works, Birmingham; A. Farnell Blair, Decatur, Ga., contractor.
 1000 tons, Air Corps hangars at New Orleans and various Maine fields, to Belmont Iron Works, Philadelphia.
 850 tons, two dry provision warehouses, naval supply depot, Oakland, Calif., to American Bridge Co., Pittsburgh.
 800 tons, six warehouses, Camp Stanley, Texas, to Mosher Steel Co., Houston, Tex.; H. B. Kilstofte, San Antonio, Tex., contractor.
 610 tons, building, Wright Field, Dayton, O., for air corps, to Indiana Bridge Co., Muncie, Ind.
 600 tons, building, Robins Dry Dock &

Repair Co., Brooklyn, to Harris Structural Steel Co., Plainfield, N. J.
 555 tons, reconstruction, track stringers, Manhattan bridge, New York, to American Bridge Co., Pittsburgh; John Roman Inc., New York, contractor.
 523 tons, state bridge No. 81 over Wisconsin river, Lone Rock, Wis., to Bethlehem Steel Co., Bethlehem, Pa.; L. G. Arnold, Eau Claire, Wis., contractor; bids July 29.
 513 tons, steel sheet piling, U. S. Engineer, Binghamton, N. Y., to Carnegie-Illinois Steel Corp., Pittsburgh, only bidder; inv. 2.
 500 tons, store, F. W. Woolworth Co., Worcester, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.
 450 tons, including 63 tons wrought iron, Wyman crossing under Maine Central railroad tracks, Fairfield, Me., to

American Bridge Co., Pittsburgh; Briggs & Grcnel Construction Corp., New York, contractor, \$203,975.70; bids Aug. 6, Augusta.
 370 tons, hangar doors for naval airports, Alaska, to Truscon Steel Co., Youngstown, O.
 325 tons, buoys and frames, navy department, Melville, R. I., to Leach Steel Co., Rochester, N. Y.
 300 tons, steel piling, connecting tunnel, Standard Oil Co., Whiting, Ind., to Inland Steel Co., Chicago; Great Lakes Dredge & Dock Co., Chicago, contractor.
 280 tons, factory, Beech Aircraft Corp., Wichita, Kans., to George C. Christopher & Son Iron Works, Wichita, Kans.
 250 tons, building, Standard Brands Inc., Dallas, Tex., to Mosher Steel Co., Houston, Tex.
 220 tons, state highway project, including bridge, Becket, Mass., to American Bridge Co., Pittsburgh; Graves & Hemmes Inc., Great Barrington, Mass., contractor.
 215 tons, state bridge, route 53, section 537-SF, Oak Forest, Ill., to Bethlehem Steel Co., Bethlehem, Pa.; bids July 29.
 200 tons, building for Buffalo Bolt Co., North Tonawanda, N. Y., to Buffalo Structural Steel Co., Buffalo.
 200 tons, various defense projects in Seattle area, to Standard Steel Fabricating & Boiler Works, Seattle.
 180 tons, substation and signal towers, Board of Transportation, Brooklyn, to Harris Structural Steel Co., Plainfield, N. J.; Federal Construction Co., New York, contractor.
 151 tons, state bridge 775 over Eau Galle river, Spring Valley, Pierce county, Wisconsin, to Wausau Iron Works, Wausau, Wis.; J. E. Hinman Co., contractor; bids July 29.
 150 tons, shipways U-3 and 4, Camden, N. J., for government, to American Bridge Co., Pittsburgh.
 145 tons, manufacturing building, Anaconia Wire & Cable Co., Marlon, Ind., to Mississippi Valley Structural Steel Co., Decatur, Ill.
 140 tons, detonator line boiler house, Kingsbury, Ind., for government, to American Bridge Co., Pittsburgh.
 120 tons, state bridge over Pond creek, South Park, Ky., to American Bridge Co., Pittsburgh.
 113 tons, shapes and bars, state highway project, including bridge, Westport, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; A. Grande, Norwood, Mass., contractor.
 110 tons, freight shed, Lehigh Valley railroad, Forty-seventh street and East River, New York, to Schacht Steel Construction Co., New York, through Rice Construction Co., New York.
 110 tons, gymnasium addition, Lincoln high school, Hurley, Wis., to American Bridge Co., Pittsburgh.
 100 tons, improvement Los Angeles river near Balboa street, Los Angeles, to unnamed interest.
 100 tons, five tugs for navy, Pacific Coast, to Pacific Coast Engineering Co., Alameda, Calif.
 100 tons, building addition, Durez Plastics & Chemicals Inc., North Tonawanda, N. Y., to R. S. McMannus Steel Construction Co., Buffalo.
 100 tons or more, motor repair shops, Camp Joseph T. Robinson, Arkansas, to Arkansas Foundry Co., Little Rock; Buford Bracy, Little Rock, Ark., contractor.
 Unstated, 513-foot state bridge, Clearwater river, Idaho, to unstated interest.



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THE HORSBURGH & SCOTT CO.

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SHAPE CONTRACTS PENDING

10,000 tons, wind tunnel, Moffet Field, Calif.; Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa., only bidder.
 3300 tons, 25 spillway gates, Kentucky dam, Gilbertsville, Ky., for Tennessee

- Valley authority, Knoxville, Tenn.
- 2500 tons, airplane test building, Chevrolet-Buffalo division, General Motors, Inc., Buffalo.
- 1750 tons, superstructure South Canal Street bridge, Chicago; bids Sept. 24.
- 1725 tons, state bridge, New York; bids Sept. 5 and Aug. 27, Albany.
- 1500 tons, factory addition, for Fairchild Aircraft division, Fairchild Engine & Airplane Corp., Hagerstown, Md.
- 1400 tons, manufacturing building, for Grand City Container Co., North Bergen, N. J.
- 1034 tons; also 3760 square feet grid steel flooring and 95,000 pounds machinery, bridge over Grassy Sound, route S-49, section 5, Wildwood, N. J.; bids Sept. 5, E. Donald Sterner, State Highway Commissioner, Trenton.
- 900 tons, manufacturing building, for Harbison-Walker Refractories Co., Clearfield, Pa.
- 700 tons, grade separation bridges, Thirtieth to Thirty-second streets, Queens, New York, for city.
- 600 tons, bulkhead frames and tubes, Kentucky dam, Gilbertsville, Ky., for Tennessee Valley authority, Knoxville, Tenn.
- 500 tons, roof framing, Parker power plant, 1540-D, Earp, Calif., for bureau of reclamation, Denver.
- 400 tons, state bridge RC-41-10, Chenango county, New York.
- 400 tons, Boys' Industrial school, Camp Hill, Pa., Reading Metalcraft Co., Reading, Pa., low.
- 400 tons, additional buildings, army ordnance base, Seneca Falls, N. Y.; Polier & McLane Corp., New York, contractor.
- 375 tons, shaft sets, Penokee mine, Ironwood, Mich., for Republic Steel Corp., Cleveland.
- 350 tons, storage building, Schenectady, N. Y., for army.
- 350 tons, six buildings, Seneca ordnance depot, Kendaia, N. Y., for war department.
- 315 tons, bridges, Bradford county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Aug. 29.
- 300 tons, three bridges, using old material, Skagit river power project, Seattle; Noble White, Seattle, low \$93,575. (second call).
- 250 tons, alterations to bridge, Harpursville, N. Y., for Delaware & Hudson railroad.
- 225 tons, crane runways and building addition, for John Wood Mfg. Co., Chicago.
- 200 tons, state bridge RC-41-38, Warrensville, N. Y.
- 175 tons, bridges, South Capitol street, Washington, for District of Columbia.
- 135 tons, steel framed storage buildings, U. S. engineer, Boston; Dawn Construction Co., Dorchester, Mass., contractor.
- 150 tons, state highway bridge over Baltimore & Ohio railroad, Jessup, Md.
- 140 tons, boiler house, Kingsbury ordnance plant, La Porte, Ind., for government.
- 140 tons, state bridge, contract 2212, Ladoga, Montgomery county, Ind., bids taken Aug. 5 rejected; new bids Aug. 26.
- 140 tons, bridge, Mississippi Forest highway, Homochitto National Forest, Franklin-Wilkinson counties, Mississippi; also 65 tons reinforcing bars; bids 'n.
- 120 tons, repairs to existing structures, Forest county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Aug. 29.
- 100 tons, 325-foot two-span I-beam bridge, Stowe, Vt.; bids Aug. 28, town clerk, Stowe; also 25 tons reinforcing steel.

- Unstated, steel hangar for Yakutat, Alaska; bids in to U. S. engineer, Seattle, Aug. 15.
- Unstated, three 95-foot tower assemblies for Coulee power plant 115 kv. transmission circuits; bids to Denver Sept. 2; Sched. 1548-D.
- Unstated, two 108-foot towers and two 364-foot suspension towers, Willamette river transmission line crossing; C. J. Montag & Sons, Portland, low \$100,328, to Bonneville project, Portland, Ore.

Reinforcing Bars

Reinforcing Bar Prices, Page 95

Reinforced concrete projects, except for defense, have dropped to a low point as deliveries under the priority plan are practically impos-

sible. Suppliers have sufficient defense work of preferred nature to take up their entire production for some time.

For several defense projects, including some army and navy bases acquired from Great Britain, tonnage is exceeding estimates substantially and contractors are pressing for shipment, but sellers are unwilling to take on additional tonnage voluntarily. Semifinished steel for reinforcing bar production is in small supply and hampers production. An instance is an eastern mill with a rolling of 1800 tons, with only 800 tons of semifinished available.

Concrete bar producers are asking designers to specify bars not



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less than 1/2-inch in diameter, to assist in production of this material. A much larger tonnage of larger sizes can be produced in the same time and slight change in design obviates use of smaller sizes.

REINFORCING STEEL AWARDS

- 7600 tons, army work at Hermiston, Oreg., to Calumet Steel Co., Chicago, for rail steel.
- 3000 tons, small arms plant, Salt Lake City, Utah, for government, to Colorado Fuel & Iron Co., Denver, through Colorado Builders Supply Co., Denver; Broderick & Gordon, contractors.
- 2000 tons, army air base, Oklahoma City, Okla., to Sheffield Steel Corp., Kansas City, Mo.
- 1700 tons, flood wall, Jeffersonville, Ind.,

- for U. S. Engineer, to Laclede Steel Co., St. Louis; Robert R. Anderson, contractor.
- 1200 tons, army picric acid plant, Marche, Ark., to Laclede Steel Co., St. Louis; Cities Service Defense Corp., contractor.
- 600 tons, grain elevator, Minneapolis, to Laclede Steel Co., St. Louis; Jones-Hettelsatter Co., contractor.
- 600 tons, additional facilities, Fort Belvoir, Va., to Rosslyn Steel & Cement Co., Rosslyn, Va.; Charles H. Tompkins Co., Washington, contractor.
- 500 tons, army depot, suburban district, Boston, to Bethlehem Steel Co., through T. Stuart & Son Co., Watertown, Mass., contractor.
- 500 tons, turbine plant, General Electric Co., Erie, Pa., divided between Jones & Laughlin Steel Corp., Pittsburgh,

- and Buffalo Steel Co., Buffalo; United Contractors & Constructors, contractors.
- 368 tons, tunnels for bomber plant, Ford Motor Co., Ypsilanti, Mich., to Great Lakes Steel Corp., Detroit, through Concrete Steel Fireproofing Co.
- 350 tons, miscellaneous buildings, air station, Lakehurst, N. J., to Truscon Steel Co., Youngstown, O.; Duffy Construction Co., New York, and Karno-Smith Co., Trenton, contractors.
- 350 tons, Indian hospital buildings, Tacoma, Wash., to Truscon Steel Co., Youngstown, O.; L. H. Hoffman, Portland, Oreg., contractor.
- 315 tons, six warehouses, Camp Stanley, Texas, to Brandt Iron Works, San Antonio, Tex.; H. B. Kilstofte, San Antonio, contractor.
- 300 tons, Atmospheric Nitrogen Co., ammonia plant, to Truscon Steel Co., Youngstown, O.
- 270 tons, mesh, air field runways, Westover field, Chicopee, Mass., to American Steel & Wire Co., Worcester, Mass.
- 250 tons, warehouse, General Foods Inc., Dorchester, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Nicholson Co., contractor.
- 230 tons, building Jewel Food Stores, Barrington, Ill., includes 90 tons bars and 140 tons wire mesh, to Joseph T. Ryerson & Son Inc., Chicago; Dahl-Stedman Co., Chicago, contractor.
- 215 tons, warehouse, Jewel Food Stores, Chicago, includes 70 tons bars and 145 tons wire mesh, to Joseph T. Ryerson & Son Inc., Chicago; Dahl-Stedman Co., Chicago, contractor.
- 200 tons, paving, Lyons county, Iowa, to Sheffield Steel Corp., Kansas City, Mo.; Western Contracting Corp., Sioux City, Iowa, contractor; bids July 29.
- 180 tons, paving, Decatur county, Iowa, to Sheffield Steel Corp., Kansas City, Mo.; Booth & Olsen Co., Sioux City, Iowa, contractor; bids July 29.
- 175 tons, building, Draper Corp., Hopedale, Mass., to Truscon Steel Co., South Boston, Mass.
- 170 tons, six double warehouses, Augusta Arsenal, Ga., to Bethlehem Steel Co., Bethlehem, Pa.; A. Farnell Blair, Decatur, Ga., contractor.
- 150 tons, mesh, additional facilities, Fort Devens, Mass., to Truscon Steel Co., South Boston; bars, previously reported as 550 tons, to Bethlehem Steel Co.; Matthew Cummings Co., Cambridge, contractor.
- 100 tons, school, Sisters of Charity, Royal Oak, Mich., to Jones & Laughlin Steel Corp., Pittsburgh, through Taylor & Gaskin; J. A. Utley, contractor.
- 100 tons, Oberlin College physics laboratory, Oberlin, O., to Hausman Steel Co.; Cleveland Construction Co., contractor.
- 100 tons or more, as needed thus far, section base, Bureau of Yards & Docks, Navy Department, Burrwood, La., to New Orleans Materials & Equipment Co., New Orleans; W. Horace Williams Co., New Orleans, contractor.



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ERIE BOLT & NUT CO.
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CONCRETE BARS COMPARED

	Tons
Week ended Aug. 23	21,523
Week ended Aug. 16	22,430
Week ended Aug. 9	7,061
This week, 1940	8,509
Weekly average, 1941	12,503
Weekly average, 1940	8,814
Weekly average, July, 1941	16,563
Total to date, 1940	299,681
Total to date, 1941	437,608

Includes awards of 100 tons or more.

REINFORCING STEEL PENDING

36,000 tons, national defense work in various parts of Pacific Ocean; bids being taken by Pacific Naval Constructors, Alameda, Calif.

1500 tons, air base, Weymouth, Mass.

5000 tons, sewage project, Queens, N. Y.; bids in.

4000 tons, PWA central heating plant, Washington.

700 tons, S. E. Kramer junior high school, Washington.

675 tons, additional buildings, Bridgeport Brass Co., Bridgeport, Conn., Stone & Webster Engineering Corp., Boston and New York, contractor.

600 tons, power plant, Potomac Electric Power Co., Washington; Stone & Webster Engineering Corp., Boston, contractor.

590 tons, contract No. 6, Manhattan tunnels, New York.

575 tons, buildings, Sperry Gyroscope Co., North Hempstead, N. Y.; Stone & Webster Engineering Corp., Boston, contractor.

400 tons, flood control dike, Hartford, Conn.; A. I. Savin Construction Co., Hartford, contractor.

300 tons, Burroughs Adding Machine Co. plant, Plymouth, Mich.

140 tons, building, Continental Can Co., Mankato, Minn.

140 tons, bridges, Bradford county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Aug. 29.

121 tons, sea wall, Rock Island, Ill., for state division of waterways; McCarthy Improvement Co., Davenport, Iowa, contractor.

120 tons, Racoon creek reservoir, Centralia, Ill.

100 tons or more, Entiat river 170-foot bridge, Chelan county, Washington; new bids soon to county commissioners.

100 tons, 100,000-gallon water storage tank; bids to W. C. Read, clerk, Bucoda, Wash., Aug. 25.

100 tons, including sheet steel piling and other items, 160-foot continuous reinforced concrete bridge, Curry county, Oreg.; bids to bureau of roads, Portland, Oreg., Aug. 27.

Unstated tonnage, chip and oil house, airplane engine plant, Studebaker Corp., South Bend, Ind.; bids Aug. 26.

Pig Iron

Pig Iron Prices, Page 96

As a rule pig iron melters have small stocks and many depend on regular shipments to maintain operations. In spite of this close situation few interruptions to production are reported. Books for September shipments have been closed, such orders being subject to approval at Washington. Setting up of the reserve pool has elicited a number of orders from other than regular customers under the emergency allotment. August shipments are heavy and few furnaces have much reserve stock. October schedules must be filed with suppliers Sept. 5 and at Washington Sept. 15. Effect of heavy machine tool production is being felt in increased priority demand in New England, at Cincinnati and other points.

Study of the September questionnaires shows a surprisingly large proportion of high priority ratings and it appears likely supplies for non defense purposes will be small. Some melters with larger stocks will be forced to use these more freely. In some cases foundry melt

will be curtailed to match available iron.

Shipments of southern iron in August have been larger to northern users, suppliers apparently trying to ship all old orders by Sept. 1. Tennessee Coal, Iron & Railroad Co. has relighted its No. 2 stack at Ensley, Ala., after relining.

In the Buffalo district a shortage of freight cars has interfered somewhat with prompt shipment, though not seriously.

Colonial furnace, recently acquired by United States Pipe & Foundry Co., Burlington, N. J., is expected to go into blast soon after Sept. 15. This stack is included in the priority regulation and it is possible some of its product may be diverted to general use.

Scrap

Scrap Prices, Page 98

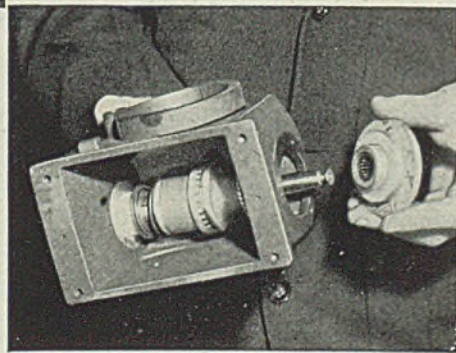
A substantial body of sentiment is developing in the scrap industry that present ceiling levels are too low to make possible reclaiming a large portion of potential scrap outside consuming districts. While the industry believes prices should be regulated it also knows that scrap will be gathered and prepared only when some profit can be made, which is impossible under present circumstances in the case of much material which would be processed at a slightly higher level. Experience has shown that on a rising market every dollar of increase brought scrap from a wider area and every decline circumscribed the

No. 10 RADIAGRAPHS RIDE SMOOTHLY ON TORRINGTON NEEDLE BEARINGS



ANTI-FRICTION TORRINGTON NEEDLE BEARINGS, on the driving wheel assembly of Airco No. 10 Radiagraphs, help assure efficient operation of these gas-cutting machines, used for making smooth, clean cuts and bevels in steel. "Torrington Needle Bearings insure ample bearing lubrication for long periods after installation and insure long bearing life," say Air Reduction engineers.

THE SMALL O. D. OF NEEDLE BEARINGS helps reduce size and weight of surrounding parts. They give low coefficient of friction, yet occupy no more space than plain bushings. The Needle Bearing units are installed by a quick, simple press fit on an ordinary arbor press. Both initial and installation costs are surprisingly low.



Your product, too, may be improved by the unusual features and economies of the Torrington Needle Bearing. Our Engineering Department will be glad to assist you in planning its use. For full information write for Catalog No. 110. For Needle Bearings to be used in heavier service, write our affiliate, Bantam Bearings Corporation, South Bend, Indiana, for Booklet 103X.



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TORRINGTON NEEDLE BEARING

territory which could ship at a profit.

Considerable scrap is moving outside normal market channels in direct deals between consumers and steel mills and sales by railroads to melters on their lines. This has resulted in disrupting usual channels and prevents some users from obtaining supplies from their established sources. Under steel priorities finished steel consumers no longer can trade scrap accumulations for preferred delivery and scrap brokers believe this will tend to enlarge tonnage moving through the open market.

Electric furnace operators in the Pittsburgh district find the situation much easier since the ceiling

on low phos grades has been raised \$1.75 per ton. Probably this fact has diverted some of this grade from other consuming points, causing corresponding shortage there. Lack of electric furnace scrap in the Pittsburgh district has been noted for several months and in some cases production has been curtailed. While there still is some difficulty in obtaining alloy scrap the flow of low phos is satisfactory, though it is not possible to build any surplus for safety.

Foundries are principal sufferers as cast grades are in light supply and new pig iron regulations have tended to intensify difficulties. Plants without priorities are having little success in obtaining either ma-

terial. Numerous instances are met of curtailed foundry production and hand-to-mouth operation, as scrap becomes available, is the rule in the case of many castings manufacturers.

In the Buffalo district most steel-makers have sufficient stocks to assure capacity operations through the summer but have only about one-fourth of what is regarded as a safe reserve to carry through the winter at a high rate of melt.

Canvass of various districts develops that dealers are not hoarding scrap, all available tonnage being prepared and shipped as rapidly as possible. The choke point apparently is largely in small collection of country scrap, dealers in all centers reporting receipts from this source are much below requirements.

Pacific Coast

San Francisco — Flow of scrap from outlying districts continues practically at a standstill and shortage has become more acute. A movement is under way to obtain large quantities of steel rails from obsolete railroads and from lines that are practically in bankruptcy or operating at a loss. While no definite appraisal has been made regarding the tonnage that can be obtained in this way, it is roughly estimated that over 100,000 tons are available.

Demand for plates continues unabated and awards aggregated 73,026 tons, bringing the total to date to 497,524 tons as compared with only 54,907 tons for the corresponding period in 1940.

Movement of cast iron pipe continues strong and demand for lots of less than 100 tons from distributors' stocks is far in excess of material actually at hand.

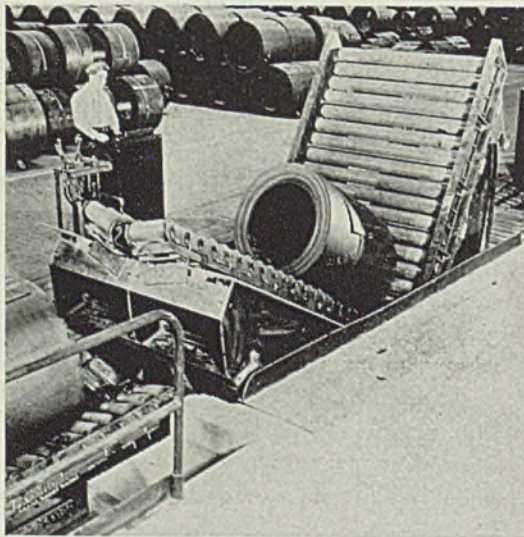
Pittsburgh-Des Moines Steel Co. submitted the only bid for 10,000 tons of shapes for a wind tunnel at Moffett Field, Calif., 40 by 80 feet, at \$6,164,320. Other concerns submitted bids on a cost-plus, fixed fee basis.

The largest reinforcing bar award went to Calumet Steel Co., 7600 tons for army work at Hermiston, Oreg. Awards totaled 8127 tons, bringing the year's aggregate to 96,350 tons, compared with 117,192 tons last year. An inquiry is in the market for 36,000 tons for national defense

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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% . . .	1.60c
Turnings, millings containing	
over 12%	1.40c
Turnings, millings, solids under 5% . . .	1.25c

Molybdenum Types

Solid scrap, not less than 7% mo-	
lybdenum, 0.50 vanadium	12.50
Turnings, millings, same basis	10.50
Solid scrap, not less than 3% mo-	
lybdenum, 4% tungsten, 0.50	
vanadium	13.50
Turnings, millings, same basis	11.50

projects located in various parts of the Pacific Ocean and Pacific Coast producers evidence little interest.

Seattle—Leading steel fabricators are refusing to quote, as practically the entire capacity is allocated to defense jobs. Present anxiety is to clear away the backlogs. For these reasons, inquiries have dropped and important tonnages for non-defense work are going begging. Seattle has postponed a 220-ton steel pipe project until priorities are settled, when new bids will be called.

Lack of intercoastal space is diverting shipments to railroads at increased cost to the buyer. To illustrate, there was a difference of \$1727 in bids to Seattle for 150 tons of 8-inch cast iron pipe, with fairly prompt delivery overland and an uncertain date by water.

Foundries are operating at capacity and find it difficult to obtain either pig or cast iron scrap. Foundry grades of pig iron are scarce and plants have to be content with basic iron with low silicon content to which ferrosilicon is added. The market anticipates increased government control. The coke situation is also tight, supplies coming both from Fernie, B. C. and eastern ovens.

The scrap situation is confused and requires official adjustment. Materials collected in Idaho and Montana, ordinarily tributary to the coast, are moving to eastern centers because of the higher base price and a differential in the freight rate. Existing conditions have thus upset the usual channels. In addition, local dealers have to compete with California. Consequently supplies of both cast iron and steel are below requirements. Dealers state that matters have been complicated by purchases direct from collectors by some leading buyers, adding that increased supervision of the market is necessary to stabilize conditions.

Associated Shipbuilders, Inc., Seattle, has bid \$1,495,000 for six of sixteen, 12,800-barrel tankers, proposed by the Maritime Commission. The local firm plans to establish a yard at Portland if awarded this contract.

Cast iron pipe is moving as fast as agencies can get fabricators to accept orders.

Jobbing houses report scarcity of some items. Replacements are being made as rapidly as possible, higher prices prevailing, due to shipment overland. Everything in stock is in strong demand and warehouse stocks are at the lowest in months.

Coke By-Products

Coke By-Product Prices, Page 95

Heavy production of coke oven by-products is moving into consumption against contracts with practically no spot material available. With demand for plastics notably strong, distributors of phenol are pro-rating supplies or covering defense priorities, but few are in a position to take on additional commitments. While household de-

mand for naphthalene is seasonally light, the slack is more than made up by industrial and chemical requirements and there is no surplus to cover spot needs even in small lots, the same applying to distillates.

Canada

Toronto, Ont.—Proposals are under discussion by government and industrial leaders regarding further curtailment in civilian uses of steel, with the object of making available substantially larger tonnages for the war effort. It is generally conceded that stocks in hands of consumers and warehouse operators

will be frozen to make them available for war industry, and also stiffening in the war priority regulations. The government has placed its problems directly in the hands of the leading steel producers and it is stated that numerous other interests are co-operating.

Despite drastic shortage of steel to meet all demands for war materials production, there is no indication that the government plans to suspend or even curtail new contracts. On the contrary there appears to be general speeding up, with recent awards largest since the outbreak of war. Rapid progress is being made towards increased production of iron and steel

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by Canadian mills, but against this is a greater expansion in secondary industry for which steel will be the most important raw material. During the past week the Department of Munitions and Supply announced shipbuilding contracts totaling upwards of \$40,000,000, which with contracts previously placed, will keep Canadian builders at capacity for the next two years. Already all Canada's production of plates has been contracted to the year end.

Canadian sheet producers are out of the market, with books fully loaded to the end of the year. With Canadian producers turning down contracts consumers are turning to United States sources of supply. It is stated that civilian consumers are unable to close contracts and practically all new commitments are directly associated with war effort.

Orders for merchant bars are heavy and mill representatives state that only small tonnage now is available for this year's delivery. Steel bar consumption is expanding and inquiry is developing from a wide variety of sources.

Merchant pig iron sales are well sustained, but show little improvement, due to supply rather than demand. Consumers are clamoring for foundry and malleable iron, which blast furnace operators are unable to supply. Producers are maintaining deliveries at about 4000 tons weekly, against consumers requirements of about three times this rate.

Further tightening of cast scrap is creating serious problems for foundry melters. Dealers report slowing down in offerings in the Toronto area, and more difficulty in making purchases in the United States. Supply of steel scrap is good and dealers are maintaining normal deliveries to mills and electric furnace interests. However the supply is not equal to all consumers' demands.

Tin Plate

Tin Plate Prices, Page 94

Tin plate output remains unchanged at 94 per cent of capacity. Mills have not yet been threatened with interference to production as a result of priorities, and except for nonintegrated mills, of which there are few, tin plant operators are not worried.

Needs for packers' cans, which account for 90 per cent or more of their business, probably will be taken care of. Users of general line cans, and tin plate for miscellaneous applications may not be so fortunate, and are beginning to show some concern. This is taking the form of heavier ordering, which is ineffective, since shipments are being made at the limit of capacity to produce and further buying merely increases backlogs. The ironical side of this situation is that many users of tin plate in miscellaneous applications have only recently swung to this material from galvanized sheets or some nonferrous

material on which they have been forced out by defense needs.

Negotiations are proceeding for an additional purchase of tin plate for Great Britain and the empire, covering first half. Material under this agreement is for shipment to all points in the empire as well as to South American countries packing food for Great Britain.

Steel in Europe

Foreign Steel Prices, Page 97

London—(By Cable)—Production of steel and iron in Great Britain continues at satisfactory rate, with some departments quieter, including structurals, black and galvanized sheets and tin plate. Demand is increasing for heavy plates, shipbuilding materials and alloy steels. The hematite iron situation is slightly improved. Exports of tin plate are light and domestic business is moderate. All exports to Japan have been stopped, except under special license.

Iron Ore

Iron Ore Prices, Page 97

Consumption of Lake Superior iron ore in July set an alltime record at 6,497,442 gross tons. Next largest figure was reached in March with 6,411,531 tons. The July figure compares with 6,231,067 tons in June and with 5,523,595 tons in July, 1940. Cumulative consumption to Aug. 1 was 43,178,525 tons, compared with 32,856,261 tons in the corresponding period last year.

Total ore at furnaces and on Lake Erie docks Aug. 1 was 31,597,386 tons, compared with 26,629,670 tons a month previous and 28,244,066 tons a year ago. At present rate of consumption estimated shipments of 75,000,000 to 78,000,000 tons for the season will be no more than sufficient to carry over to the opening of navigation in 1942. With new blast furnace capacity probably in service about the end of the year the situation next spring may be tighter than it was at the opening of navigation this year.

Equipment

New York—Machine tool delivery schedules are being revised under the priority ruling effective Aug. 15, some shop equipment being moved ahead of originally scheduled tools and others are diverted in order of importance under the defense program by OPM. For the time numerous machines for the navy are being given preference as to deliveries, this policy filtering through to builders of instruments and other equipment for the department program. Tremendous orders for the enhanced aircraft engine program are being assembled, and, although relatively limited purchases have been approved or allocated, bookings for engine builders are increasing. New England builders of grinding machines have booked substantial orders for Pennsylvania shops starting or increasing the production of

aircraft engines. Tooling for new bomber engine facilities is under the supervision of Wright Field, Dayton, O. Steel, motors and other supplies covered by top priorities are moving in sufficient volume to machine tool builders to maintain growing production. As the result of widespread expansions steadily getting into production, shipments of machinery mount monthly, but sustained defense needs and unprecedented orders hold backlogs to the highest peak in the history of the industry.

Riddlesburg, Pa., Stack To Be Relighted Soon

■ Riddlesburg Coal & Iron Co., Riddlesburg, Pa., has been incorporated to take over and operate the former Colonial blast furnace in that city. The new company is a wholly-owned subsidiary of the United States Pipe & Foundry Co.

Officers are: Chairman of the board, N. F. S. Russell; president, Thomas W. Kennedy; plant manager, Frank J. Kennedy; secretary and treasurer, Don H. Tyson; traffic manager, J. K. Hiltner.

Company will mine its own coal and operate on coke produced in its own ovens. Expectation is that the furnace, now undergoing repairs, will be lighted about Oct. 1.

NAM Institute Studies Defense Labor Problem

■ Impact of repeated strikes, continued pressure of union leaders for closed shops and inability of federal machinery to curb losses running into millions of man days on defense projects were studied and discussed at a summer institute of employment relations last week. Sponsored by the National Association of Manufacturers, New York, and Vermont University, the institute was held at Burlington, Vt.

Launched a year ago, the summer institute is said to be a new method of studying and improving industrial labor practices. Walter D. Fuller, NAM president, and president of Curtis Publishing Co., Philadelphia, reported more than 200 leading American corporations were represented. Outstanding industrialists and educators attended the sessions.

Exports of Farm Tools Decrease 12 Per Cent

■ Exports of farm implements and machinery in June totaled \$6,345,409, down 12 per cent from \$7,179,482 in the month in 1940, according to the Department of Commerce. Shipments abroad in the first six months aggregated \$40,841,144, compared with a total of \$43,448,583 in

the corresponding period last year.

Foreign sales of tractors, parts and accessories were valued at \$4,923,089 in June, 12 per cent above \$4,414,809 for the month in 1940. Tillage implement exports totaled \$462,171, more than 40 per cent lower than shipments of \$788,038 in June last year.

Exports of harvesting machinery in the month declined 60 per cent to \$571,896 from \$1,483,252 in June, 1940. Miscellaneous types of farm equipment exported were valued at \$388,253, against \$493,383 in the month a year ago.

Steel & Wire To Double Duluth Coke Output

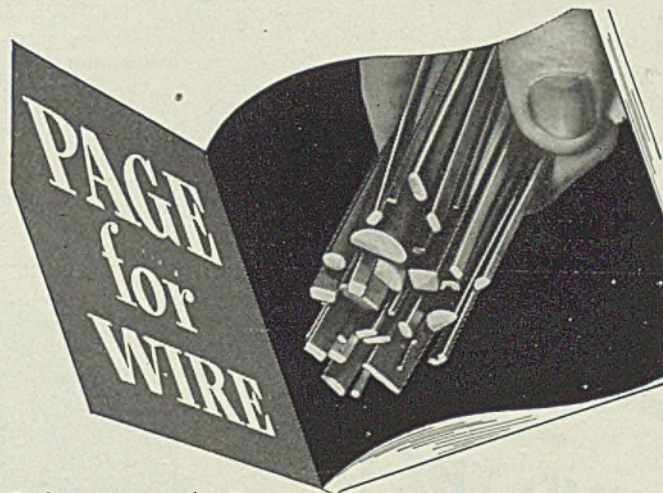
■ American Steel & Wire Co., United States Steel Corp. subsidiary, is rehabilitating the idle half of its 90-oven by-product coke plant at Duluth. When all units

are in operation about Sept. 10 the plant will produce about 35,000 tons of coke per month, the additional tonnage to be shipped to Chicago units of Carnegie-Illinois Steel Corp. The ovens are of 12½-ton capacity.

Nonferrous Metals

New York — Government control over nonferrous metal markets was extended last week and additional regulations pend as demand for all nonferrous metals continues to exceed estimates.

Copper — Price Schedule No. 20 was issued, establishing a ceiling on copper scrap prices, effective Aug. 19. Top prices at which makers may sell were fixed on the basis of 10.00c for No. 1 heavy in lots under 20 tons and 10.50c in lots over 20 tons, delivered buyer's plant or warehouse. Maximum sale price by any other person was fixed at 10.75c with no quantity differential. Partial



Shaped Wire, Welding Electrodes and General Wire

In this period of emergency, when National Defense takes precedence, many find it possible to use new production standards on new or substitute materials.

We know from experience that many users of shaped wire have been able to adapt standard production shapes to replace shapes that require special mill runs.

The shapes shown above suggest a few of the many which are standard that PAGE turns out—widths up to 3/8" and end section areas to approximately .250 square inches.

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A shield-arc type electrode for maximum strength, penetration and uniformity—vertical, horizontal or overhead welding.

PAGE-ALLEGHENY STAINLESS

Shield-arc type electrodes from which you can select one that will give you weld metal in welds that equals the stainless you weld.



Nonferrous Metal Prices

Aug.	Copper			Straits Tin		Lead	Lead	Zinc	Alumi- num	Anti- mony	Nickel
	del. Conn.	Lake, del. Midwest	Castina. refinery	New York Spot	New York Futures							N. Y.	St. L.	St. L.	99%	Amer. Spot, N.Y.	Cath- odes
16	12.00	12.00	11.75	52.00	51.50	5.85	5.70	7.25	17.00	14.00	35.00
18	12.00	12.00	11.75	52.00	51.50	5.85	5.70	7.25	17.00	14.00	35.00
19	12.00	12.00	11.75	52.00	51.62 1/2	5.85	5.70	7.25	17.00	14.00	35.00
20	12.00	12.00	11.75	52.00	51.75	5.85	5.70	7.25	17.00	14.00	35.00
21	12.00	12.00	11.75	52.00	51.75	5.85	5.70	7.25	17.00	14.00	35.00
22	12.00	12.00	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
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Wire

Yellow brass (high)	19.73
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OLD METALS

Nom. Dealers' Buying Prices

No. 1 Composition Red Brass

New York	10.00-10.25
Cleveland	10.50-10.75
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	4.00-4.12 1/2
St. Louis	4.50-5.00

Aluminum

Mis., 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, 1. c. l.	13.25
Standard No. 12 aluminum	16.00

or even complete priority on fabricated products is a strong possibility.

Lead—OPACS and other government agencies are considering methods that will act to release hoarded lead scrap and ceiling prices may be fixed well below current levels. Despite the warning that high scrap prices must be lowered, no reductions were reported last week. Refined lead stocks at the end of July totaled only 19,172 tons, a new low.

Zinc—Quantities of zinc which producers must set aside for the September emergency pool were set at 27 per cent of July output. Sellers' unfilled orders continue to decline as shipments exceed fresh sales.

Tin—Offerings of Straits tin for nearby delivery at the maximum OPACS price of 52.00c remained light. In an effort to ease the tight situation Metals Reserve Co. announced that it would release a moderate tonnage from its reserves for immediate delivery.

Aluminum—Price of virgin aluminum ingot will be reduced two cents a pound to the basis of 15.00c for ninety-nine per cent plus on all shipments made after Sept. 30. Prices for fabricated aluminum will also be reduced at least two cents per pound and in some cases the reduction will be more. Scrap and secondary aluminum prices are expected to be adjusted downward in line with the primary market.

Defense Contracts

(Concluded from Page 42)

Co., Kansas City, Mo., Walker-Turner drill presses, Aircraft assembly plant, Kansas City, Kans., \$5487.01.

Fairbanks, Morse & Co., Boston, equipment for Warren street pumping station, West Springfield, Mass., Connecticut river flood control project, \$40,986.

Fairchild Aviation Corp., Jamaica, N. Y., stereocomparagraph and mirror stereoscopes, \$47,198.40.

Flour City Ornamental Iron Co., Minneapolis, ponton sets, \$725,816.

General American Transportation Corp., Chicago, railroad cars, \$36,624.

General Motors Corp., Chevrolet Division, Detroit, trucks, Valdosta, Ga., Moultrie, Ga., and Sebring, Fla., airfields, \$8393.16.

Gibbons, Boyd H., Los Angeles, station wagons and pickup trucks, Los Angeles engineer district, \$17,727.55.

Haffner-Thrall Car Co., Chicago, railroad cars, \$29,424.45.

Hagerman Construction Co., Ft. Wayne, Ind., radio station building, Ft. Wayne airfield (Baer Field) Indiana, \$4909.

Hercules Powder Co. Inc., Wilmington, Del., blasting machines and galvanometers, \$7912.50.

Hobart Mfg. Co., Troy, O., puree mixers, Jefferson barracks, Missouri, \$5455.60.

Hughson, Wm. L., Co., San Francisco, station wagon body type trucks, Moffet field, California, \$6769.63.

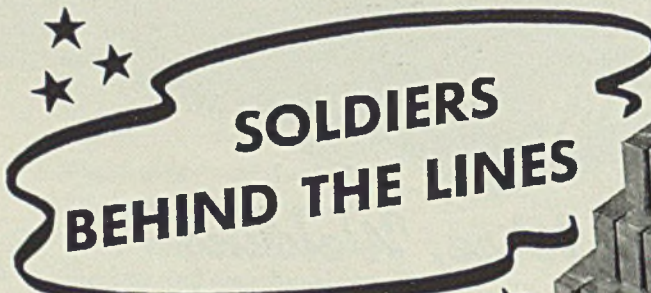
Illinois Range Co., Chicago, miscellaneous kitchen equipment, Blioxi, Miss., \$23,496.

Independent Pneumatic Tool Co., Chicago, accessories for air compressor, \$4437.40.

Keating, Daniel J., Co., Philadelphia, boiler houses and steam distribution systems, Scott field, Illinois, \$269,000.

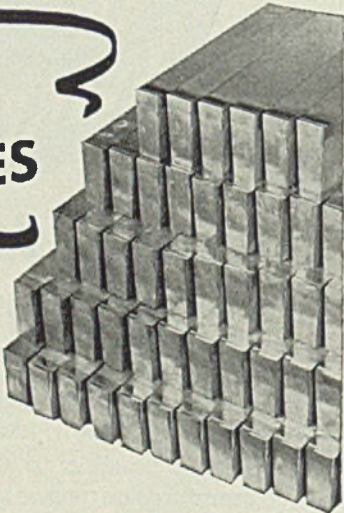
Kiefaber, W. H., Co., Dayton, O., vacuum pumps, \$4049.99.

Jones & Laughlin Steel Corp., New Orleans, door assemblies, including



KENNAMETAL

Base Facing Tools for Machining 75mm. Shells



Foremost in the present Defense effort are the Nation's machine shops . . . busy turning rough forgings and castings into finished parts for guns, shells, tanks, planes, ships, and other armament. And vital to increased machine shop production are KENNAMETAL steel-cutting carbide tools. For KENNAMETAL turns, bores, and faces steel of all hardness up to 550 Brinell at three to ten times faster speeds than high speed steel . . . increasing machine tool production from 30 to 50%.

Standard and Modified Standard KENNAMETAL tools are now shipped within 10 days of receipt of order; standard blanks within 3 to 4 days. On unusually large orders, partial shipments are made within the above times. Some standard KENNAMETAL tools (supplied in grade KM only) are now carried in stock for immediate delivery.

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Because this new material has an unequalled combination of advantages, racks coated with it stand up longer, even in severe plating cycles—are unaffected by alkaline cleaners, acid dips, and plating solutions. And out-of-service time is cut to a minimum because of the speed and ease with which Unichrome "Air Dry" Rack Coatings are applied. Racks are dipped in the shipping container—the material dries at room temperatures.

Here are the seven big time- and money-saving advantages at a glance:

INSOLUBLE—withstands hot cleaners and all plating solutions

SAFE—contains no ingredients harmful to plating solutions

TOUGH—withstands wear and tear of handling

FLEXIBLE—withstands repeated flexing and bending

DURABLE—reduces the need for recoating

CONVENIENT—any part can be patched without recoating the entire rack

EASILY APPLIED—dipping is done in the container in which it is shipped—the material dries at room temperature.

Address requests for further information or a trial order to the nearest office below.

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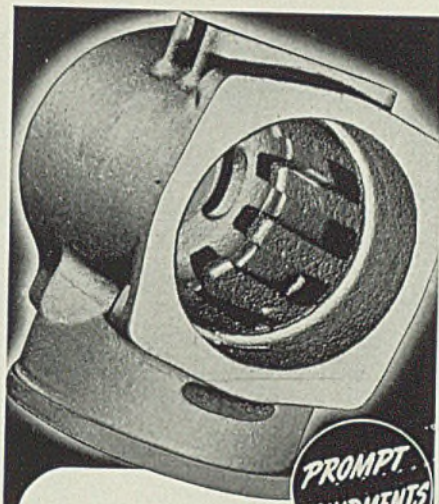
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August 25, 1941

hangar doors, \$9290.
Link-Belt Co., Chicago, coal handling equipment, Chanute field, Rantoul, Ill., \$3977.
Machine Tool & Supply Co., Tulsa, Okla., metal shapers, hydraulic surface grinder, sliding geared head engine lathe, aircraft assembly plant, Tulsa, Okla., \$26,687.12.
Maine Steel Inc., South Portland, Me., anchors, \$8078.40.
Mapel, John T., Miami Beach, Fla., construction and installation of basic lighting system, South Dade county airport, Homestead, Fla., \$12,600.
Market Forge Co., Everett, Mass., steamers, Jefferson barracks, Missouri, \$6456.
McGrath Welding & Machine Works, Omaha, Nebr., sheet metal shrinking machines, lazy arm standards, Aircraft assembly plant, Ft. Crook, Nebraska, \$5458.
Mora, Gerald, Houston, Tex., underground magazines, Ellington field, Houston, Tex., \$29,718.22.
Mosher Steel Co., Dallas, Tex., structural steel for air corps hangars, Aviation Mechanics' school, Wichita Falls, Tex., \$313,655.
New York, Chicago & St. Louis Railroad Co., Cleveland, rails and ties, Army air corps airport, Allen county, Indiana, \$8313.49.
Outboard, Marine & Mfg. Co., Johnson Motors Division, Waukegan, Ill., outboard motors, \$23,470.20.
Pacific States Cast Iron Pipe Co., Ironton, Utah, pipe and fittings, Hill field, Ogden, Utah, \$9013.29.
Pittsburgh-Des Moines Steel Co., Dallas, Tex., 400,000-gallon elevated steel water tank, Lake Charles airport, Louisiana, \$45,230; elevated steel water tank, Midland field, Texas, \$52,520.
Plumb, Fayette R., Inc., Philadelphia, hand tools, \$4840.50.
Savory Inc., Newark, N. J., electric toasters, Jefferson barracks, Missouri, \$4075.
Smith Booth Usher Co., Los Angeles, universal back geared metal shapers, aircraft assembly plant, Tulsa, Okla., \$4730.
Somerville, Thos., Co., Washington, miscellaneous pipe and fittings, Washington National airport, Gravelly Point, D. C., \$7113.88.
Southwestern Fence Co., Houston, Tex., boundary fence, Ellington field, Houston, Tex., \$18,672.
Sperry Gyroscope Co., Brooklyn, N. Y., searchlight units, \$5,464.450.
Sutton, James R., New Orleans, structural steel for control tower, Lake Charles, La., \$3680.
Trallier Co. of America, Cincinnati, semitrailers and dollies, \$265,789.88.
Travelcar Corp., Detroit, semitrailers, \$73,080.
Truscon Steel Co., New Orleans, steel windows, aviation mechanics training school, Biloxi, Miss., \$8358.
United Steel Fabricators Inc., Wooster, O., steam tunnel cover plates, \$4388.
Upson-Walton Co., Cleveland, boat hooks and ponton oars, \$10,749.76.
Volker Bros. Inc., Buffalo, N. Y., lighting system, Tri-Cities airport, Endicott, N. Y., \$10,467.74.
Warren Pipe Co. of Mass. Inc., Boston, cast iron pipe, bell and spigot, West-over field, Chicopee Falls, Mass., \$4671.20.
Washington Spring Works Inc., Washington, pumps, \$3633.75.
Watts, Charles R. & Co., Seattle, fencing, Neah Bay, Wash., \$5830.
Well Machinery & Supply Co. Inc., Ft. Worth, Tex., drill presses, bench grinders, aircraft assembly plant, Tulsa, Okla., \$17,798.75.
Winn Electrical Co., Bronx, N. Y., the basic lighting system, municipal airport No. 2, Louisville, Ky., \$23,697.97.
Worthington Pump & Machinery Corp., Harrison, N. J., pumping station equipment, Meadow Hill pumping station, East Hartford, Conn., \$39,196.



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Construction and Enterprise

Ohio

AKRON, O.—Atlantic Foundry Co., 182 Beaver street, is increasing warehouse space 2500 square feet, at cost of about \$3000.

BARBERTON, O.—Barberton Foundry Co., R. Shook, 197 Huston street, manager, is adding two bays to increase production, at cost of about \$9000.

CLEVELAND—Upson Walton Co., Clarence H. Mathews, president, which recently occupied new plant at 12500 Elmwood avenue, will add about 3600 square feet to its forge shop, 30 x 120 feet, with three doors and monorail. Plans are by Bonfield & Cumming, architects, 1900 Euclid avenue.

CLEVELAND—Tube Craft Inc., 1328 West Seventy-eighth street, John Held, president, will move soon to its new plant at 1950 West 114th street. Bids are being received for an addition of 4000

Additional Construction and Enterprise leads may be found in the list of Shapes Pending on page 102 and Reinforcing Bars Pending on page 105 in this issue.

square feet. Company manufactures tubular furniture and bus seats and is negotiating for defense contracts.

CLEVELAND—A.E.S. Tools Inc. has been incorporated to manufacture cutting tools, with Arthur L. Wheeler, 627 Union Commerce building, a principal. Main office will be in Cleveland but plant probably will be outside.

CLEVELAND—National Acme Co. will build a plant addition at Cott road and East 131st street, to cost about \$300,000. Defense Plant Corp. will supply equipment to cost \$488,000 and will retain title to it. The addition will cover about 45,000 square feet.

CLEVELAND—Webber Gage Co., 2517 Vestry street, George D. Webber, president-treasurer, is building a new plant of 4000 square feet at 12900 Triskett road, costing about \$17,000.

CLEVELAND—National Bronze & Aluminum Foundry Co., East Eighty-eighth street, John L. Schmeller, executive vice president, will start production soon on two large defense orders. Airplane fuselage castings for North American Aviation Corp. bombers represent about \$5,000,000 and aluminum castings for Packard Motor Co. for aircraft engines represent a large amount. Heat treatment department will be expanded by 65 x 167-foot addition to cost about \$35,000. H. L. Vokes Co., 5300 Chester avenue, has general contract.

CLEVELAND—Cleveland Steel Tool Co., Ralph J. Venning, president, is adding 1500 square feet to a storage building at cost of \$4000.

CLEVELAND—Tinnerman Products Co., 2038 Fulton road, has let contract to Austin Co., 16110 Euclid avenue for design and construction of a one-story plant addition 56 x 150 feet, costing \$40,000. (Noted August 4.)

LORAIN, O.—Lorain Products Corp., 200 Seventh street, plans a plant addition to increase output of electrical machinery. F. J. McFadden, 442 Oberlin avenue, architect, is taking bids.

Connecticut

BRIDGEPORT, CONN.—Remington-Rand Inc., 1087 Railroad avenue, has

let contract for a plant addition to Harry Marling Jr. Inc., 536 Lindley street, Bridgeport, at estimated cost of \$100,000. (Noted August 11.)

BRIDGEPORT, CONN.—Sprague Meter Co. is having plans made for a one-story addition to cost about \$45,000, with equipment.

BRISTOL, CONN.—New Departure division of General Motors Corp. is building a four-story addition 40 x 60 feet, to cost about \$85,000, with equipment.

MIDDLEFIELD, CONN.—Lyman Gun Sight Corp. is building a two-story addition 45 x 68 feet, to cost \$50,000, with equipment.

NEW HAVEN, CONN.—Acme Wire Co. is having plans made for an addition to its steam power house, to cost about \$45,000, with equipment.

NEW HAVEN, CONN.—High Standard Mfg. Co., is building a new plant, estimated to cost about \$4,300,000, financed by government funds.

WATERBURY, CONN.—Scovill Mfg. Co. Inc. is building a four-story addition 80 x 330 feet to enlarge casting shop, at cost of about \$500,000, with equipment.

Massachusetts

ATTLEBORO, MASS.—Marathon Co. is building a one-story plant to cost about \$25,000.

LYNN, MASS.—General Electric Co. is building a plant for manufacture of reduction gears for merchant ships, to be financed by Defense Plant Corp.

SOUTHBRIDGE, MASS.—Surveys are being made for a sewage treatment plant. Greeley & Hansen, 6 North Michigan avenue, Chicago, are engineers.

New York

LONG ISLAND CITY, N. Y.—Phelps-Dodge Copper Products Co., 40 Wall street, New York, will build a furnace building extension at Meeker avenue bridge, general contract to Brown & Matthews Inc., 122 East Forty-second street, New York, at about \$150,000.

TAHAWAS, N. Y.—Titanium Pigment Corp., 111 Broadway, New York, will build a plant, including boilerhouse, and install complete electric equipment, at estimated cost of \$3,500,000.

New Jersey

MOUNT HOLLY, N. J.—Plains Corp., subsidiary of Superior Zinc Corp., has bought 600 acres near Chatsworth, N. J., and is said to be about to install ten furnaces for reducing zinc ore.

NORTH BERGEN, N. J.—Grand City Contalner Corp., 622 West Fifty-seventh street, New York, has let contract to Brown & Matthews Inc., 122 East Forty-second street, New York, for a one and two-story office and manufacturing building, 300 x 800 feet, costing about \$750,000. (Noted July 7.)

Pennsylvania

ALLENTOWN, PA.—Hellman Boiler Works, 110 Linden street, will build a one-story plant unit to cost over \$40,000.

ERIE, PA.—Erie County Electric Co., Twelfth and French streets, has plans for extensions and improvements at its generating station at West Fifth and Cranberry streets, with installation of additional equipment to increase capacity. United Engineers & Constructors



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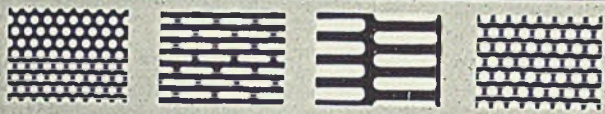
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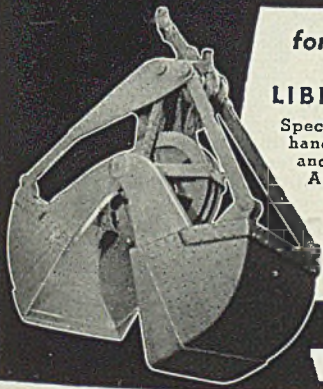
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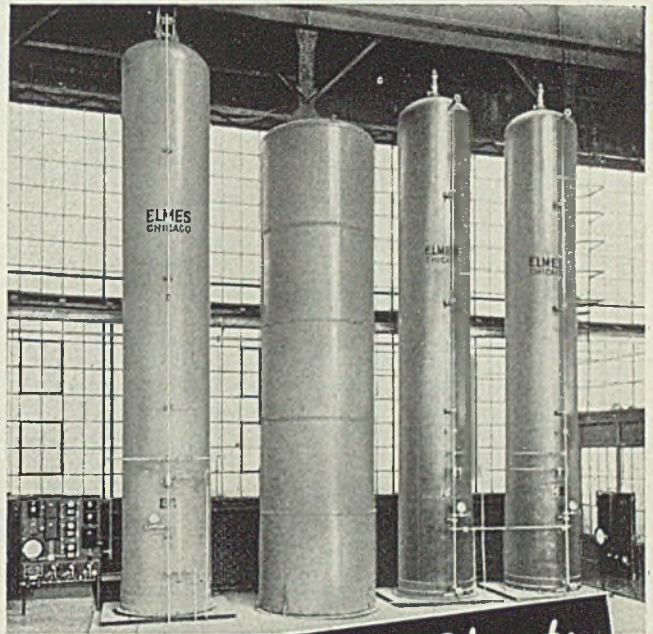
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Inc., 1401 Arch street, Philadelphia, is engineer.

SHILLINGTON, PA.—Fairly Silk Mills, E. S. Jenckes, manager, will build a boiler house addition costing about \$40,000.

Michigan

ALBION, MICH.—Decker Screw Products Co., E. C. Blewend, vice president, is building three plant additions, for manufacture of screw machine products, dies, tools and special machinery.

GLADSTONE, MICH.—Marble Arms & Mfg. Co. has given contract to William Nelson for a one-story plant addition 40 x 80 feet.

GREENVILLE, MICH.—Federal Mogul

Corp. will build a one-story bronze foundry building 60 x 150 feet for manufacture of propellers and marine equipment for the navy. Robinson, Campau & Crowe, Grand Rapids, Mich., are architects.

JACKSON, MICH.—Pittsburgh Forging Co., has let contract to Austin Co., Detroit, for a small manufacturing addition to its plant in Jackson.

YPSILANTI, MICH.—Streicher Die & Tool Co. is building a one-story plant 60 x 140 feet.

Illinois

CHICAGO—Bids will be taken until Sept. 11 for ventilating equipment for State street and Dearborn street subways by Philip Harrington, commissioner of subways, 20 North Wacker drive.

CHICAGO—Wittek Mfg. Co., 4305 West Twenty-fourth place, manufacturer of hose clamps for airplanes, automobiles, etc., will build a 10,000-square foot addition to accommodate defense business.

GRANITE CITY, ILL.—Granite City Steel Co. plans additional facilities for increased ingot production and OPM has been asked to certify the program for government financing.

MOLINE, ILL.—City will apply to PWA for \$400,000 to finance waterworks improvements to care for added population resulting from national defense program. Included are water mains, a 500,000-gallon elevated steel tank and new screenhouse at pumping station.

Indiana

INDIANAPOLIS, IND. — Indianapolis Power & Light Co. has plans for expansion and improvements in its steam-electric generating plant in Harding street, including a 37,500-kw. turbo-generator unit and auxiliaries, estimated to cost about \$2,000,000. This is in addition to a similar unit to be completed in August.

LA PORTE, IND.—Water department, A. Baker, superintendent, has plans for extensions to the waterworks system to give capacity of 7,000,000 gallons per day, with additional wells, buildings and equipment, to cost about \$115,000.

Missouri

SIKESTON, MO.—Hahs Machine Works plans erection of one-story 60 x 120-foot machine shop building, to cost over \$40,000, with equipment.

ST. LOUIS—McDonnell Aircraft Corp., Lambert St. Louis Airport, will build a Defense Plant Corp. project covering 44,000 square feet, blackout type. Plans are by Palmer & Lamdin, 1020 St. Paul street, Baltimore.

ST. LOUIS—Whitefield Aircraft Corp., 315 North Seventh street, has given contract to Charles Kist, 2301 South Kingshighway, for a 60 x 160-foot airplane hangar in connection with new airport in Jefferson county.

VICHY, MO.—War department has selected site here for \$1,500,000 airport project in connection with Fort Leonard Wood, including 5500 feet of reinforced concrete runways, hangars, shops, barracks, water, lighting and sewage disposal facilities.

Oklahoma

OKLAHOMA CITY, OKLA. — Roy Stephens Inc. will build 55 miles of 16-inch natural gas line from Cement, Okla., to Oklahoma City, including two booster stations, at cost of about \$750,000.

Wisconsin

BELOIT, WIS.—Yates-American Machine Co. will build a storage addition to its plant.

GREEN BAY, WIS.—Wisconsin Public Service Commission, Bellen building, will let a contract soon for superstructure of an 82 x 176-foot power plant. Public Utility Engineering & Service Co., 231 South La Salle street, Chicago, is engineer.

MILWAUKEE—A. F. Wagner Iron Works is building an addition 60 x 90 feet.

PORT EDWARDS, WIS.—Nekoosa-Edwards Paper Co. has given contract to Frank Henry, Wisconsin Rapids, Wis., for a one-story plant addition 50 x 200 feet.

WASHINGTON ISLAND, WIS.—Washington Island Electric Co-operative Inc. will build a generating plant on REA



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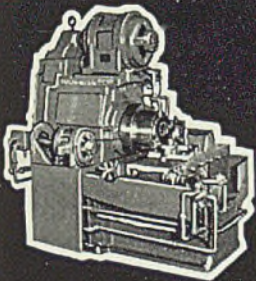
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allotment, costing about \$51,000.

Minnesota

MINNEAPOLIS — Minneapolis-Moline Power Implement Co., manufacturer of agricultural machinery and fabricated structural steel, will build a one-story foundry addition 50 x 375 feet. (For other expansion see STEEL, Aug. 4.)

ST. PAUL—Seeger Refrigerator Co., Walter G. Seeger, president, manufacturer of refrigerator cabinets and defense products, has given contract to George J. Grant Construction Co. for a plant addition costing about \$200,000.

Texas

AUSTIN, TEX. — Bureau of reclamation, Denver, will take bids to Aug. 29 for 13½-ton gantry crane to handle bulkhead gates at Marshall Ford dam.

CORPUS CHRISTI, TEX. — Central Power & Light Co., John T. Persons, chief engineer, has let contract to Alkin & Hinman, Avery Point, Tex., for plant addition to house fourth generating unit, to cost about \$645,000. Sargent & Lundy Inc., 140 South Dearborn street, Chicago, are engineers.

PORT ARTHUR, TEX.—Texasteel Mfg. Co., G. Worth in charge, will build plant costing about \$1,000,000, general contract probably to go to Spence & Howe Construction Co. H. E. Beyster Corp., Detroit, is engineer.

Kansas

HAYS, KANS.—Texas Pipe Line Co., Philtower building, Tulsa, Okla., will build 72 miles of 6 and 10-inch pipe lines at cost of about \$90,000.

WICHITA, KANS.—Kansas Gas & Electric Co., 201 North Market street, will build 186 miles of 154,000-volt transmission line from El Dorado to Sabetha, Kans., to connect with Nebraska Power Co. line, to cost about \$2,500,000. Contract to Continental Construction Co., 340 North Central street, Chicago.

South Dakota

SIOUX FALLS, S. DAK.—City, C. M. Whitfield, auditor, has let contract to

Butler Mfg. Co., Minneapolis, for a pre-fabricated building 60 x 140 feet for machine shop, to house 14 metal lathes, spot welder, punch and drill press, arc welding equipment and other tools.

Iowa

WEST UNION, IOWA—City has given contract to E. B. Spencer Construction Co., Waterloo, Iowa, for sewage disposal plant, auxiliary equipment and piping, at \$30,000.

Idaho

LEWISTON, IDAHO—Victor Van Dyk, manager Clearwater foundry, recently burned, will build a new structure, concrete walls and metal roof, costing about \$10,000.

KELLOGG, IDAHO—J. B. Hafner, manager, Bunker Hill & Sullivan Mining & Concentrating Co., has plans for a proposed \$500,000 fuming plant addition to smelter for recovery of lead, zinc and cadmium from smelter slag. Equipment is said to have priority approval.

California

BELL, CALIF.—Apex Steel Corp., 6147 South Eastern avenue, will build a plant addition at cost of about \$7200.

LOS ANGELES—Wilshire Fireplace Equipment Co. has been formed by Gerald P. Rubens and will conduct business at 1515 Naud street.

LOS ANGELES—Bingo Tool & Machine Works has been formed by Fred V. Graf and will establish a plant at 3225 Union Pacific avenue.

LOS ANGELES—Dullen Steel Products Corp., 11613 South Alameda street, will build a warehouse costing about \$5000.

LOS ANGELES—Industrial Pipe & Steel Co., 5707 South Alameda street, has been organized by Adam C. McCuat.

LOS ANGELES—Marman Products Co. has built a 10,000-square foot plant at 940 West Redondo boulevard for machining die castings and small forgings.

LOS ANGELES—Standard Steel Corp., 5001 South Boyle avenue, has built a 4000-square foot toolroom addition.

MODESTO, CALIF.—Modesto Foundry Inc. is rebuilding its foundry plant, recently destroyed by fire.

RIVERSIDE, CALIF.—Riverside Iron Works has been formed by Ned Hall and Carl Peterson and will operate a plant at 520 Mission boulevard, Riverside.

WILMINGTON, CALIF.—Phelps-Dodge Copper Products Corp. is having plans prepared for a plant on Los Angeles harbor, near Wilmington, to cost about \$725,000 for land and buildings.

Washington

LA CENTER, WASH.—Eureka Corp., capital \$50,000, has been organized by Tri-State Tractor Co., T. C. McCamey manager, to manufacture tractors, machines and vehicles.

SEATTLE—N. S. Foundry, 1140 Elliott avenue West, is building an addition 25 x 53 feet.

SEATTLE—Seattle Transit System has called bids for machinery and equipment for the Atlantic street terminal shops for opening at various dates. Bids include 2000-pound motor hoist, 12,000-pound hydraulic hoist, 60-ton hydraulic press, lathes, boring machines, grinders, shears, grinding machines, forging machines, polishers, etc.

TACOMA, WASH.—City has appropriated \$300,000 for preliminary construction costs on proposed Nisqually municipal power plant.

Canada

ST. JOHN, N. B.—St. John Dry Dock & Shipbuilding Co. Ltd. will build addition and make repairs to cost about \$200,000. Canadian Dredge & Dock Co. has contract.

LONDON, ONT.—Empire Brass Mfg. Co. Ltd., Dundas street, is having plans drawn for one-story addition 35 x 80 feet, to cost about \$60,000, with equipment.

MALTON, ONT.—National Steel Car Corp. Ltd., Kenilworth avenue, Hamilton, Ont., has let contract to Gratton Construction Co., 486 Clinton street, Toronto, Ont., for addition to aircraft division, here, to cost about \$250,000.

OSHAWA, ONT.—General Motors Corp. of Canada Ltd., William street, will build one-story addition 160 x 200 feet, to cost about \$250,000, with equipment.

TORONTO, ONT.—Standard Cycle Products Ltd., 407 Logan avenue, will build one-story plant 100 x 180 feet for manufacture of bicycles, etc., to cost about \$100,000, with equipment.

TRENTON, ONT.—Department of munitions and supply, Ottawa, Ont., is taking bids for additional buildings here for airplane repair depot costing about \$250,000, with equipment.

WINDSOR, ONT.—Chrysler Corp. of Canada Ltd., 300 Tecumseh boulevard, has given contract to R. J. Wilson Ltd., 341 Tecumseh boulevard for plant addition to cost about \$40,000.

SHAWINIGAN FALLS, QUE.—Shawinigan Stainless Steel Co. Ltd. will build addition to cost \$50,000. H. S. Reid is superintendent.

ST. JOHN, QUE.—Singer Mfg. Co. Ltd. will build two additions for manufacture of sewing machines, munitions, etc., to cost about \$220,000, with equipment; contract to J. P. Traham, 178 Mercer street.

REGINA, SASK.—Imperial Oil Co. Ltd., Church street, Toronto, Ont., will build refinery addition costing about \$55,000. One building will be 60 x 93 feet and another 40 x 60 feet.

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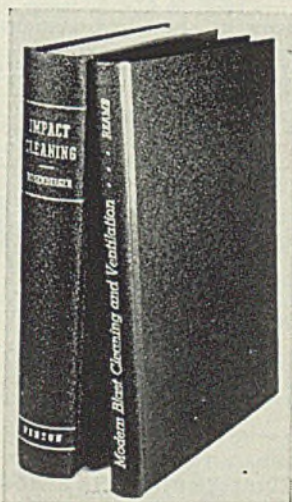
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