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# STEEL

ESTABLISHED 1882

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PRODUCTION • PROCESSING • DISTRIBUTION • USE



# Conversion TO WAR PRODUCTION CALLS FOR MORE INFORMATION ABOUT ALLOYS...



*Conversion* to war production makes great demands upon both plants and personnel. While altering plant layouts, experienced employees must be taught correct methods of handling new operations on different metals. New employees must be trained...and taught to avoid waste and spoilage of critical materials.

You can *quickly* obtain practical answers to questions about the selection, fabrication and uses of ferrous and non-ferrous alloys containing Nickel by asking us. We have on hand a fund of information collected through years of research, field studies and experiences of alloy users.

This data has been checked and edited into convenient charts and pamphlets. These printed pieces range from technical data for engineers to simplified guides for apprentices.

Now...with minutes and materials so vital to Victory...make full use of this metal-working experience. Our technical staff also offers personal assistance in overcoming problems created when Nickel was allotted to places where it serves the Nation best.

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# HIGHLIGHTING THIS ISSUE OF STEEL

THE NEWS about the one most vital factor, production, is getting better each week. Steel production is increasing rather than decreasing as was feared some months ago. Four months' output of ingots (p. 52) was at annual rate of 84,500,000 net tons. Last week the industry again operated at 99 per cent of ingot capacity (p. 53). Many new moves have been taken to insure a continuance of the improvement in the production picture (p. 50), particularly in the field of transportation. A gratifying feature is the increase in the scrap supply, a result of the all-out salvage campaign (p. 131). There still is great uneasiness, however, since this class of scrap is a non-recurring material and disappears with use; hence the outlook for building up adequate stocks for next winter is none too bright.

The net significance of General Conservation Order M-126 (p. 59) is that thousands of plants, as E. L. Shaner puts it (p. 45), must "convert—or else". Those affected who have not already sought essential work that will give them the benefit of priorities have no time to lose. They are urged to exert all possible ingenuity and effort in getting contracts or subcontracts involving war or essential civilian production. In the hope that they will prove of some suggestive value in regard to procedure this issue of STEEL again carries (pp. 46-49) the details of the famous York plan of subcontracting. . . . Stung by the recent charges of priority violations United States Steel Corp. stockholders last week called for an end to government "sniping" of business (p. 77).

A new list covers materials whose use for construction purposes is prohibited (p. 60) . . . . Flying through clouds and fog now is safe (p. 68) . . . . A. H. Allen gives a preview of the automobile of the future (p. 63) . . . . First quarter steelmaking profits reflect the effect of higher taxes and costs (p. 78) . . . . A new

OPA order clarifies the effect of the recent 6 per cent freight rate increase on iron and steel prices (p. 139) . . . . WPB order guarantees scheduled delivery of construction materials for new aluminum and magnesium plants (p. 56); copper use is limited further; Indian kyanite is under complete allocations . . . . A new order aims at avoiding electric power shortages (p. 58) . . . . Scrap dealers are to be licensed (p. 53) . . . . New critical machine tools are under allocations (p. 61) . . . . It will be easier for mill supply distributors to replace stocks (p. 74).

Guy Hubbard tells (p. 82) how a manufacturer of business machines successfully changed over to make a heavy volume of ordnance items while still continuing to fill the requirements of the Army and Navy for its regular products. . . . What is being done about finding substitutes for the bronzes is revealed (p. 88) by N. K. B. Patch. . . . Newly developed transparent coating for glass (p. 90) prevents shattering of glass broken in air raids. . . . R. F. Ellis explains a much simplified technique (p. 94) for fabricating stainless steel into dairy equipment, items that must meet the most rigid specifications, including the mirror finishing of all welds.

Republic Steel Corp. increases output of its blast furnaces from 10 to almost 20 per cent (p. 107) raising the sinter content in the furnace burden to as much as 45 per cent; this practice offers an important new means for greatly increasing output of pig iron in this country. Coke and flux consumption go down, less flue dust is produced. . . . A. W. Gregg points out (p. 110) the increasingly vital position being assumed by the converter in raising the volume of steel castings that can be produced by foundries to meet war requirements. . . . New hydraulic stretching press (p. 102) cuts die costs, handles wide range of work. . . . Movable scales speed weigh-counting (p. 104), save 8 man-hours per day.



# These Plants Want War Work

So many manufacturers have indicated they have available capacity and are anxious for war work that we have asked them to prepare brief outlines of their facilities, which are listed below. We are most anxious to help place these companies in contact with overloaded "prime" contractors or Government agencies in order that America will quickly attain maximum

war production. If you have war work to place, wire or write us and we will give you the names and addresses of any of the companies in which you are interested. Even if the type of plant you need is not listed, it may pay you to get in touch with us because we have and are continuing to assemble information on additional plants.

**IS-11** Capacity of three large plants in the Middle West, 1,000 emp. For production of 10—24 gage steel products including shearing, forming, stamping, drawing, welding, riveting, dip and spray painting and electro-galvanizing. Adequate capital and highest credit rating.

**IS-12** Large Ill. concern, 36 yrs. mfg. machinery equipment, 20,000 sq. ft. of mfg. space with approx. 100,000 sq. ft. for storage. Slab milling machine, gear shaper for internal and external spur cutting, engine and spindle lathes, vertical boring mill, gear hobber, milling machine, sensitive, radial and vertical power drills, tapping machine, planers, cutting saws and electric welding machines. Have 38 men on three shifts, also training classes. Interested principally in war work sub-contracts for medium size parts.

**IS-13** Ohio mfr. of decorated metal dry package cans, signs and displays. Two plants, fl. space 370,000 sq. ft.; employ 250. Dry package assembly line from 1½" to 16" diameter. Automatic and hand-fed punch presses, complete decorating and baking equipment, with facilities for coating and baking sheet metal. Lithographing, engraving and screen processes.

**IS-14** Large Mid-west spring bed mfr. in fireproof building with over 40,000 sq. ft. fl. space, located on railroad siding. Plant includes a full line of punch presses, coiling machines and various other equipment used in making bed springs. Have coilers for making special springs for aviation industry. Also two shapers, two lathes, milling machine, drill press, grinders, heat treating facilities and misc. machine shop equipment.

**IS-15** Long established Mo. fabricator heavy sheet metal, light plate and structurals. Equipment includes 10 ft. and 12 ft. press brakes, gate shears, 10 ft. rolls (plain and corrugated), punch and drill presses, welding and gas cutting equipment, many years experience in Government work and currently occupied on sub-contract basis. Working one shift only.

**IS-16** Thirty-year-old nationally known Mo. mfr. employing 250 including approximately 36 men on eng. staff, has 75,000 sq. ft. of floor space for seven day week operation. Equipped to form standard and special shapes from sheet steel, channels, angles and Z-bars. Complete machine and welding shop.

**IS-17** Large steel furniture mfr. in Ill., located on two railroad sidings. Plant fl. space over 100,000 sq. ft., employs 150 to 200 men on one shift. Complete facilities for handling up to 14 gage steel sheets, steel stampings, light gage tubular and angle iron fabrication. All types of finishes, including solid colors and wood grains. Plant has complete machine and paint shops with ample capacity of punch and drill presses, benders, lathes, grinders and shears, hand and power brakes and welders. Have successfully completed great variety of war work contracts.

**IS-18** Middle West stove concern, approx. 200,000 sq. ft. working space with complete equipment for stampings, spot welding, drilling, brazing, and assembly of parts, including finishing bake ovens.

**IS-19** Nationally known implement mfr. (Ind.) desiring direct or sub-contract war work, with complete equipment for metal forming and small drop forgings, including punch presses and shears, drop and trip hammers, threaders, forging rolls, double end grinders, eye-benders, bull dozers, lathes, and forging furnaces.

**IS-20** Complete fabricating plant in Ohio, 50,000 sq. ft. fl. space, thoroughly experienced in war work, available capacity for sheet metal stampings, light structurals and sheet metal fabrication.

**IS-21** Ohio mfr. having 66,000 sq. ft. of available plant floor space and 85 employees desires war contracts. Plant includes 5 double end punch and shears (200 to 20 tons pressure), 2 single end punch and shears (100 and 78 tons pressure), 2 single end inclinable punch presses (7½ tons pressure), 5 belt-driven drop hammers (1,000 to 90 lb.), 3 bull dozers—24 in. to 16 in. stroke, 4 presses, 3 planers, lathes, drill presses, boring machines, and 7 heating furnaces.

**IS-22** Ill. mfr. of range boilers, hot water tanks, 27,000 sq. ft. fl. space, property adjoining available for expansion. Average number of emp. 60. Complete facilities for welding and fabricating 16 ga. to ¼ in. sheet metal. Hand operated and automatic electric welders. Have facilities for galvanizing, kettle size 39 in. by 11 ft. long and 4 ft. deep. Willing to convert plant to war production.

**IS-23** Large Mid-west stove mfr. with complete facilities including 300 presses ranging from 400 ton triple-acting hydraulic to small punch presses. All types of spot, seam and portable electric welders, automatic plating, japanning equipment with conveyerized ovens, complete porcelain enameling plants with continuous type furnaces. Grey-iron foundry. Will send experienced engineers to discuss direct or sub-contracts for war work.

**IS-24** Large heating, ventilating and air conditioning company in Ill. with complete facilities for welding of all types including electric, oxy-acetylene, stationary and gun type spot welding. Shearing and braking cap. up to 10 gage 10 ft. wide, and machine shop equipment. Up-to-date finishing department and large bake oven. Approx. 100 employees.

**IS-25** Modern mfg. plant (Wis.) with complete equipment and trained personnel for fabricating sheet steel products 12—32 gage. Over 750,000 sq. ft. fl. space in well lighted and ventilated brick and steel buildings. Exceptional opportunity for mfg. and assembly lines. Equipment includes 117 punch presses, 50 shears, hammers, drills, lathes, welders and complete machine shop. Sub-contract business given careful attention by war contract division of this company.

**IS-26** Ind. sheet metal manufacturer with 800 employees and 450,000 square feet of plant floor space has 7 air presses, 4 double action presses, 1 hydraulic press, 12 blanking presses, and 13 small punch presses. Complete welding and painting equipment and all types of assembly. Have been making bottle coolers, sinks, cabinets, automobile and jeep bodies.

**IS-27** Bicycle accessory manufacturer in Ia. Employing 25 (one shift) has available facilities for additional war work including stamping and drawing presses, automatic screw machines, lathes, drill presses, welders, shapers, grinders, benders, and riveting machines. Complete Cadmium plating plant. One story fire-proof building 66' by 132', steam heated, glass enclosed. Located in wholesale manufacturing district.

Write or wire for names and addresses of companies.

*Dedicated  
to Victory*

## INLAND STEEL CO.

38 S. Dearborn Street, Chicago

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## STEEL

May 11, 1942

### ORDER M-126 MEANS CONVERT OR ELSE . . . .

Industrialists who have been watching the trend of government policy since Pearl Harbor were not surprised by Conservation Order M-126. The steady procession of orders during recent months which limited the manufacture of automobiles, refrigerators, washing machines, typewriters and similar articles was an advance warning that sooner or later the axe would fall on numerous lesser articles which are fabricated from precious iron and steel.

Order M-126 prohibits the fabrication, assembly or delivery of about 400 manufactured items after August 1, 1942. May 5 was the "governing date" of the order. Raw materials may be delivered for 15 days after May 5. Processing of materials to the extent of 75 per cent of the average monthly weight used by the processor in 1941 may be continued for 45 days after May 5. After 90 days from May 5 no person shall assemble any item on the prohibited list which is made of iron or steel.

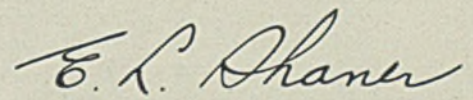
While the progressive features of this program indicate that WPB has tried to give manufacturers and distributors a little time for adjusting their affairs, the order is bound to cause violent repercussions. It is likely to affect a far greater variety of smaller shops than was the case in the limitation orders on automobiles.

Obviously this order will have the effect of transforming certain existing inventories of iron and steel into manufactured articles speedily, after which a considerable volume of manufacturing and distributing facilities will be available for something else.

A portion of these facilities can be converted to war work. Some of them already are in the process of conversion. Since early in March, STEEL has been presenting examples of successful conversion jobs every week in the hope that these case studies might offer suggestions to the managers of still unconverted shops as to how they might proceed.

Now the acute need for conversion strikes at hundreds of establishments which heretofore have been partially immune. Their only hope for survival lies in their own ability to exercise ingenuity and resourcefulness.

Scores of plants whose prospects for conversion looked hopeless have found a way to convert. Check up on their experience. Study their methods. Fight for your very existence and in doing so, help win the war!



Editor-in-Chief



It has been said that

# SUBCONTRACTING

## WILL WIN THE WAR

THE WAY to win this war is for more cities and towns to turn themselves into Arsenals of Democracy like York, Pa.

Matching York won't be easy. That community of 95,000 entered the battle of production well equipped for the job. It had metal-working plants with a wide variety of equipment that normally made everything from 300-ton bank vault doors to food mixers for bakeries. Many other towns have industrial resources as extensive, though hardly as varied. Important factors in the shifting of York's plants to war work were leadership, ingenuity and organization—and no town has a monopoly on these American traits.

Among the first firms in the country to convert its men and machines to the production of war materials was the York Safe & Lock Co. Since September, 1938, it has contracted for nearly \$100,000,000 worth of diversified war equipment. This conversion story is the story of men who used the brains and hands and machines they had and found a way to help their country and themselves.

Much of the credit for the plant's important contribution to the national war effort and to the prosperity of itself and of York's citizens must go, ironically, to the depression of the early 30's. The York Safe & Lock Co., builders of vaults for some of the largest banks in

*... and there is much truth in that, for subcontracting greatly increases the capacity of prime contractors, enables them to handle more and different types of war work than they could do themselves. Too, subcontracting allows the production facilities of a host of small shops to be utilized effectively. This resume of how it works may show you how to get your own plant into war work quickly*

the country, found business terrible during and after the depression. So many banks had closed their doors that the market was flooded with hundreds of second-hand bank vaults, all built to last. Practically no one could be persuaded to order a new one.

Then, after staggering through the depression, the York Safe & Lock Co. looked up and saw war clouds. Realizing that America was unprepared, the management took stock of its plant to see what it had that could be used to help make the United States and its fellow democracies stronger. It found plenty.

First of all, it had machinery which could and did, for example, construct a 300-ton bank vault door and hang it so precisely on a 30-ton hinge that it could be opened and closed easily with one hand. It also had the machinery to make and assemble the intricate pieces of the combination time lock for that door.

Further, of course, it had highly skilled workers to man those ma-

chines, workers trained to handle precision work on custom-built jobs. Not a small asset was the experience the management and many of the workers had obtained when the plant had filled war orders—mostly firing mechanisms—in World War I.

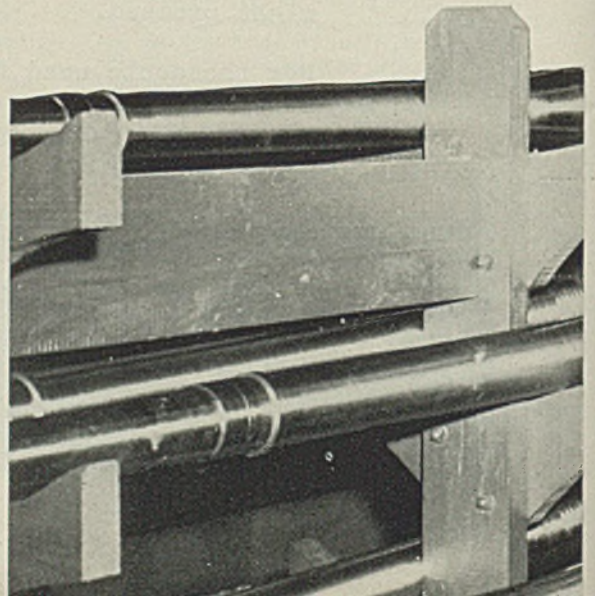
But one of the biggest assets York Safe & Lock had was its neighbors—the large and small machine shops in the community. Most of them were manned by precision artisans who normally turned out a diversified assortment of products. And one of its assets, don't forget, was the necessity of finding work for its machines and men.

The management took a list of its assets to Washington and matched them against the War Department's needs. It returned with the first ordnance contract let to private industry since the last war—a seven-figure job. S. Forry Laucks, president of the firm, and Charles Sioberg, general manager, attacked the problem of filling the order by

Fig. 1—This operator ran a lathe for Uncle Sam in 1917 and now he's running one for him again. Here he is machining a gun barrel that will go into a 37-millimeter anti-tank gun

Fig. 2—These 37-millimeter gun barrels are completed and ready for assembly into the gun mounts. Note the tongs used to grip the barrels for handling by hoist are carefully kept from contacting the barrel directly by use of pads. All photos from Office of Emergency Management, by Hollem

Fig. 3—Breech ring for a 37-millimeter gun is being drilled here. The plant in which these 37-millimeter guns and gun mounts are now being made formerly produced safes and locks. It was successful in converting practically all of its production equipment to war work, all these illustrations being taken in this same plant





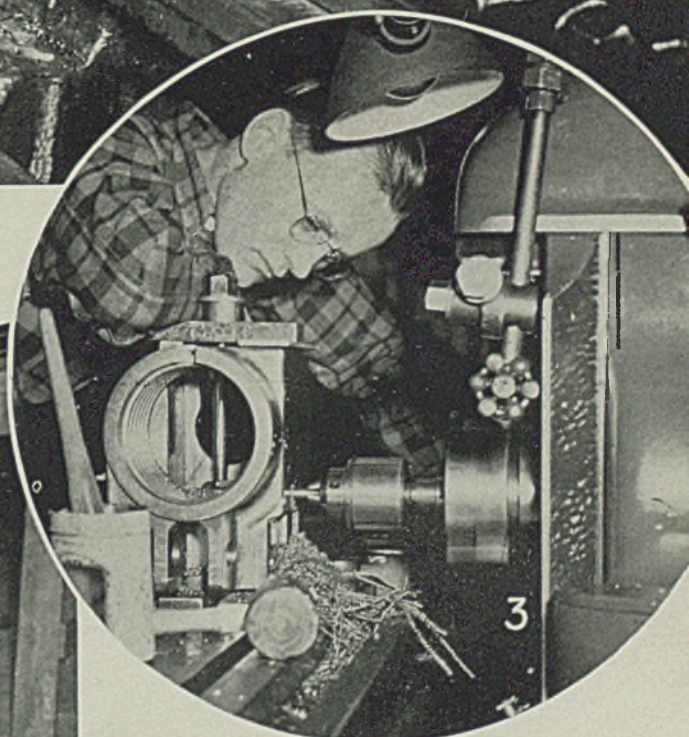
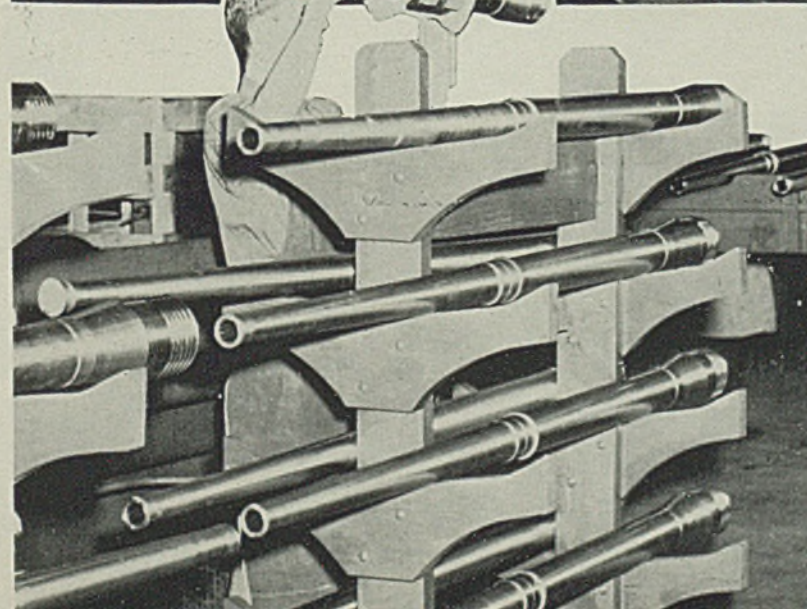
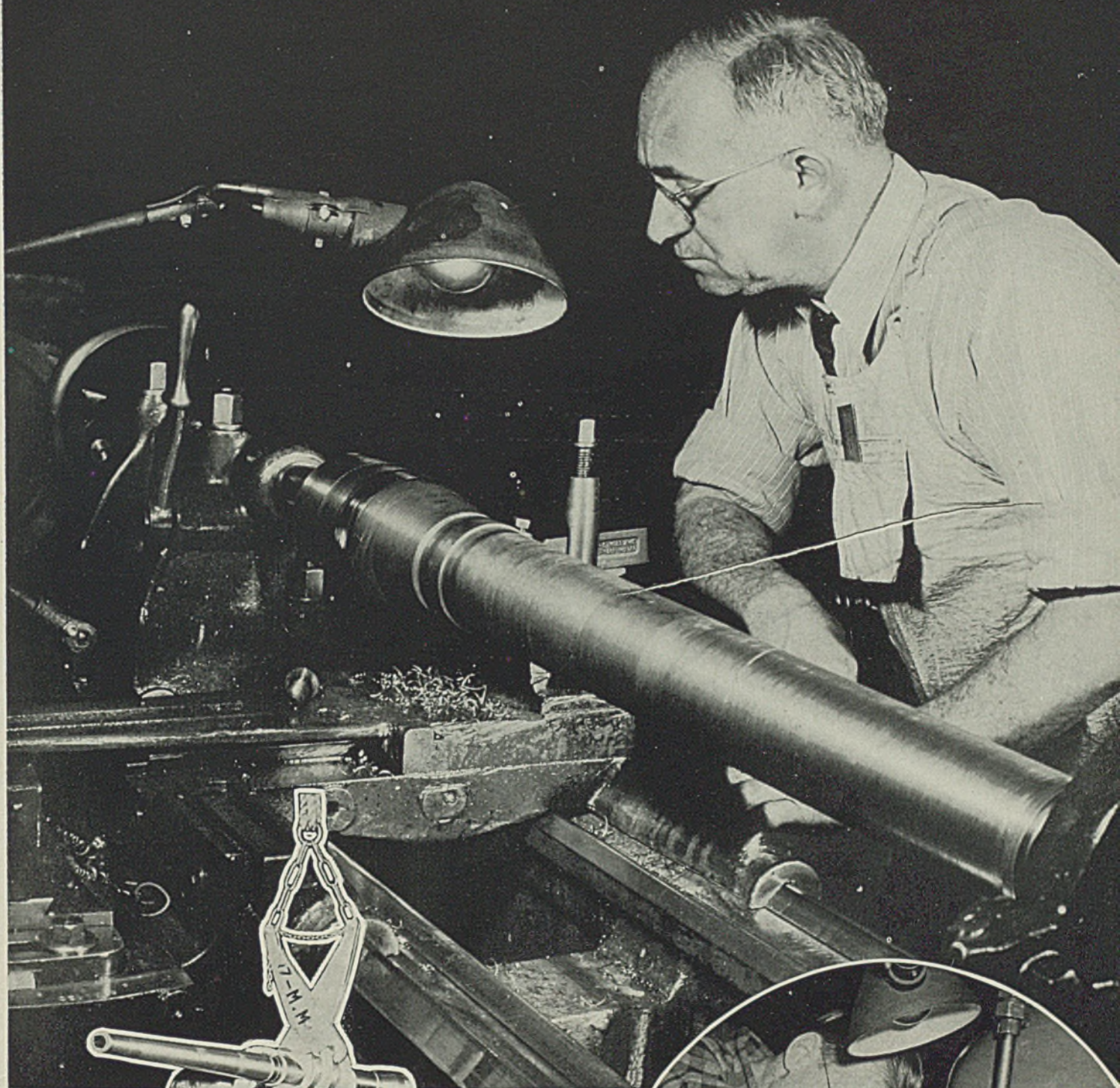




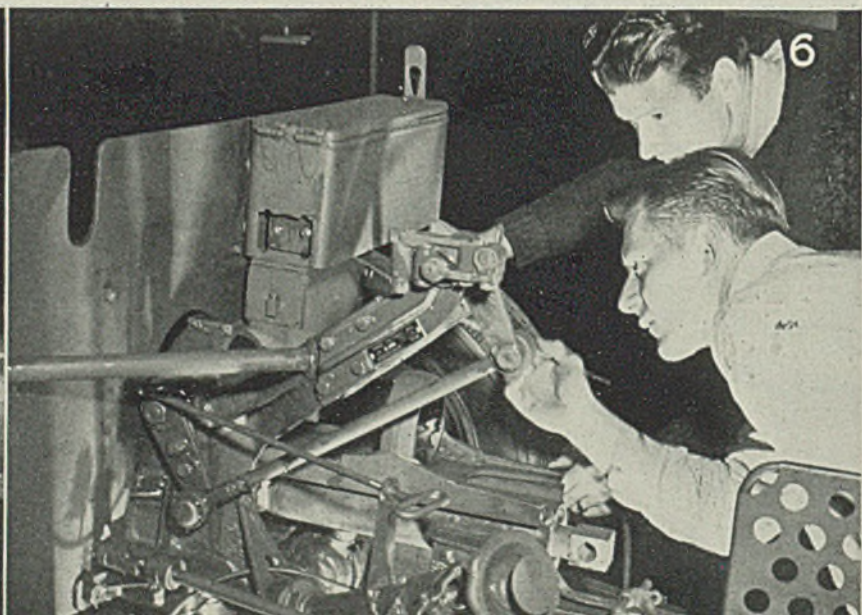
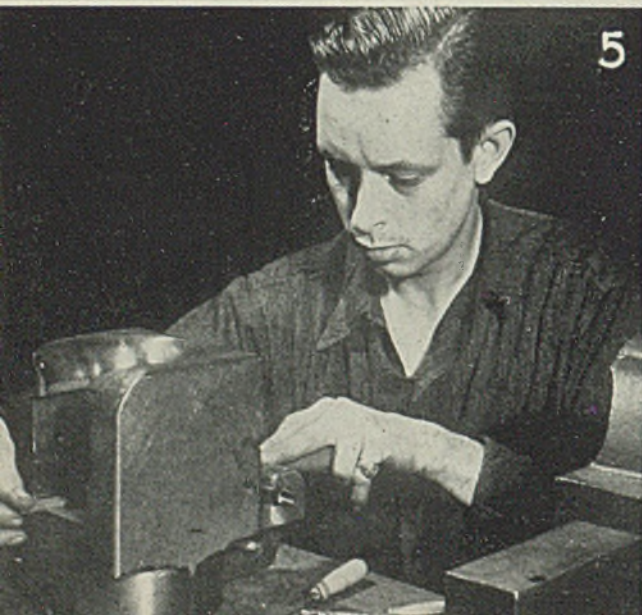


Fig. 4—After spending 16 years as an auto mechanic, this worker finds his chance to help in war production by assembling 37-millimeter gun mounts in a factory which formerly made locks and safes for civilian use

Fig. 5—Ex-auto mechanic at work in an ex-lock factory. The breech ring of a 37-millimeter gun is being given a final touching up before going into the assembly line. Corners on odd-shaped sections such as this are rounded by use of a hand file

Fig. 6—Here the partially assembled gun mount is being painted with a brush. Note the gun barrel has not yet been mounted into the main slide, a portion of which can be seen just below the painter's hand

Fig. 7—In this view, the gun barrel, breech block and accompanying parts have been assembled into the mount and a workman is checking the operation of the various controls on what will shortly be one of Uncle Sam's weapons for anti-tank service





"breaking down" the job into 6000 parts. Many, they found, could be made by concerns in the vicinity which normally specialized in similar parts. Others could be made by companies with skilled workers and versatile machines that could be converted to new tasks.

Altogether, 45 per cent of the work on that first job was subcontracted to nearby plants. But—and this is a policy from which they have never deviated—they kept the most difficult parts in their own plant. Because of the versatility of its machines and because of the clever manner in which the machines were used, the management found it could use practically every machine in the plant. Gages, gears and some special-purpose machinery had to be added, but much of the new machinery expanded rather than changed the plant.

After efficiently fulfilling that first contract, York Safe & Lock won other contracts. Personnel doubled then quadrupled, within a few months, and has since doubled and doubled again. A large assembly plant has been added, and a huge new ordnance plant will be in production soon. Because there is still demand for safes and locks and fireproof doors, the company has not completely abandoned production of them, although they amount to less than 5 per cent of total operations.

York Safe & Lock has learned, however, that it can't produce its normal products efficiently on the machines used in war production. There is, the management explains, too much crossing and recrossing of materials and men. So an old building was bought some distance from the plant, and there the production of the company's normal line is concentrated.

In its dealings with subcontractors, the management has learned many things, but nothing more important than the recognition that the subcontractor must be able to make money on the work, or at

least be protected against loss. Therefore, the company did not insist on fixed prices from many of its subcontractors. Laucks and Sioberg knew the other firms, their capabilities and limitations. They could guess pretty shrewdly whether a firm was capable of handling a certain job at a reasonable cost.

They adopted the system of "pilot jobs"—giving a plant some work to do, helping it get started right, and finding out from that job whether it could be counted on for further orders. As the subcontractor did more and more work, it became more and more possible to fix in advance a price for a job.

One of the difficulties was the inexperience of many of the subcontractors with the rigid inspections of Army and Navy engineers, who must insist that parts meet specifications closely. There is a tendency, the management learned, for some shop workers to do precise work on parts that are made to fit together but to relax on parts which don't have to fit anything except the air.

Because it is human to err, many of the subcontractors occasionally spoil valuable material and waste time by not turning out work exact enough, or by making outright mistakes.

If the mistakes are rare and if the shop is essentially a good one, the management has found it is best not to penalize it too heavily. Much waste can be avoided by close inspection of the subcontractor's methods and by showing him how to proceed.

Altogether, York Safe & Lock has turned out or is working on 18 different items for the Army and Navy, and the machines and men of virtually every shop in the community have had a share in the work. And York Safe in turn does some subcontract work for other shops in the community which have prime contracts.

"Do what you can with what you

have," became the cry of the York manufacturers' association. York Ice Machinery Corp., stirred by the potentialities of the machines in the community, called in representatives of several other firms to go over blue prints of heavy guns and parts. They found that among them they could swing the job. York Ice Machinery took the responsibility for a good-sized contract, which has been subcontracted widely with each plant doing what it can with what it has.

In addition to expanding its normal production of refrigeration units and compressors to meet the demands of the Navy, York Ice Machinery is doing subcontracting work for some 25 firms, including York Safe & Lock.

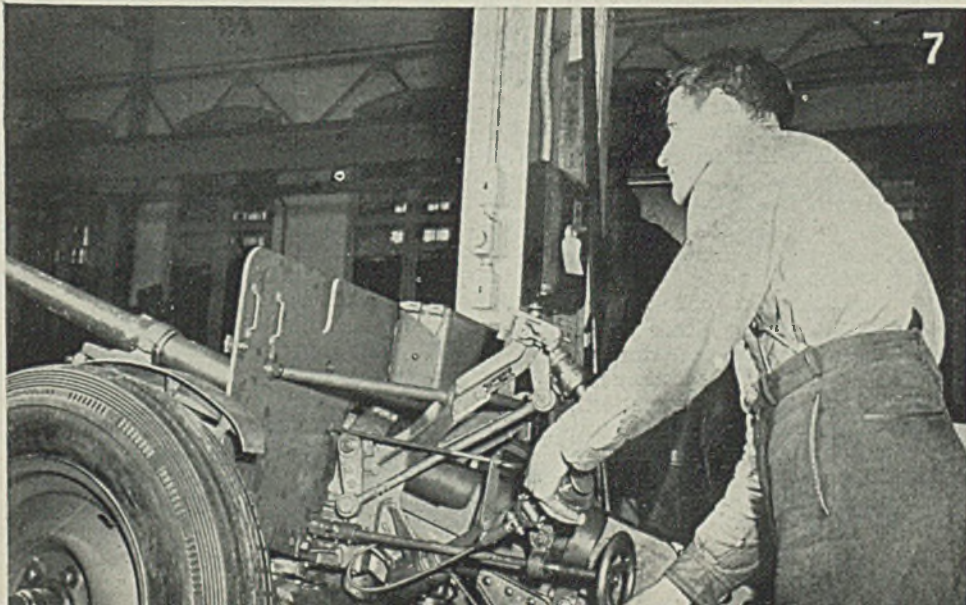
The Read Machinery Co., which had been making food mixers of all sizes and shapes for a long time, began making food mixers for army camps instead of for bakeries. Then it found that a powder mixer is very like a dough mixer turned upside down, and it has gone to work on them.

Still not satisfied it was doing all it could, it contracted to construct a number of field pieces, subcontracting to nearby shops, including York Ice Machinery, all the operations it could not readily perform with its own facilities.

Finally, a unique situation has been achieved in the community since, in one way or another, almost every plant is working for every other plant. For example, the A. B. Farquhar Co., which has not neglected its farm machinery but which also has war contracts, subcontracts work to York Ice Machinery, which in turn has a contract of its own and does work for York Safe & Lock.

But with all their conversion, the manufacturers have not neglected production of those normal items necessary for war. Three chain manufacturers continue to make chains—but for the Army and Navy instead of for civilian use. Similarly, roofing companies, a false teeth manufacturer, and shoe, shirt and hosiery manufacturers continue to make their regular products because the Army needs them. One way or another, the manufacturers of York have put virtually every suitable man and machine to work on wartime needs.

Have the manufacturers in your community converted to war work as completely? Remember, if you do not yet have war work, you can still get on the band wagon. List your facilities with your local Contract Field Office of the Bureau of Field Operations, Division of Industry Operations of the War Production Board. (See list in STEEL, April 20, 1942, Section Two, p. 26.) There you will be placed in touch with subcontracting opportunities.





# Drive for Steel's Raw Materials Intensified As Uses Are Curtailed

**Production running ahead of last year. May reach 86,000,000 tons despite gloomy Washington predictions . . . Grain shipping banned on lake bulk carriers . . . 90,000,000 tons of iron ore is goal**

DOUBLE-BARRELED effort to assure an adequate steel supply for America's and the United Nations' tremendous war effort was intensified by war agencies last week in two moves:

1. Further curtailment in use of steel and other metals in civilian goods by prohibiting them in more than 400 products (see page 59). This followed a long list of individual limitation orders banning or restricting their use in automobiles, trucks, household appliances of various kinds, metal furniture, farm machinery, construction, office machinery and several score other items.

2. Provisions for increasing the available supplies of raw materials to allow existing steel capacity to operate as near as possible to capacity. To clear the way for movement of a greater tonnage of iron ore on the Great Lakes, the Office of Defense Transportation has prohibited, after May 15, the carrying of grain by any American carrier suitable for moving ore. Other orders controlling short-haul coal shipments, and other commodities are expected to be issued soon.

Despite earlier predictions of a probable decrease in steel output from 1941, production figures reveal the industry is exceeding last year's record. Total production for the first four months this year was 28,161,202 tons, more than 4 per cent over the 27,030,888 tons produced in the comparable 1941 period.

This, of course, required unusual efforts and ingeniousness on the part of the steel producers. It has

required abnormal charges and melts and the pushing of facilities far beyond rated capacity. It has necessitated mills sending out representatives to comb the country for scrap, which strangely, in some cases has brought down upon them the wrath of OPA.

If the combined efforts of co-operating government agencies and the industry can maintain this pace throughout the year, it appears probable this year's output of steel ingots may reach 86,000,000 tons. First quarter production was 21,038,889. Second quarter production is starting on basis of more than 22,000,000 tons. If this rate can be maintained throughout the summer months of the third quarter—when available scrap should flow more freely—a drop to 21,000,000 tons in the fourth quarter would still give an 86,000,000-ton plus total.

#### More Collections Possible

Admittedly the scrap situation is far from satisfactory. In addition to the present shortage, there is the probability that fewer civilian products — automobiles, refrigerators and other appliances, farm machinery, and the like—will be scrapped due to the limitations on new production.

Heroic measures to collect what scrap is available are either under way or in process of organization. To date, the yield of these measures has been under expectations, but there appears no good reason why they cannot be made more effective.

Included in these moves are the

programs to scrap obsolete automobiles in junkers' yards; removal of unused streetcar rails; farm scrap collection campaigns; community scrap collection drives; and slag dump mining. The United States may be forced to adopt the methods of European countries at war and confiscate old cannon, iron stairs and ornamental iron to augment the supply.

Easing of OPA restrictions to obtain scrap which at present is considered economically unavailable due to the cost of collecting, processing and shipping under current price restrictions may become necessary.

A considerable amount of new pig iron capacity will be made available during this year and should aid in alleviating the scrap shortage.

The new controls over the movements of lake vessels have encouraged war agency officials to raise their sights again on the probable iron ore movement. They now are aiming for 90,000,000 tons.

ODT's order brings under Director Eastman's control approximately 430 ships with a gross carrying capacity of nearly 3,000,000 tons, suited to ore cargo, and a number of mixed carriers used in scrap, coal and grain movement.

#### Must Have Permit

The order specifically states that "unless first authorized by a general or a special permit issued by this office, no person shall operate or permit the operation of any vessel, which is capable of transporting iron ore, in the transportation of grain from any port, point or place on the Great Lakes," and asserts that the ODT director will determine a vessel's ore-carrying capabilities.

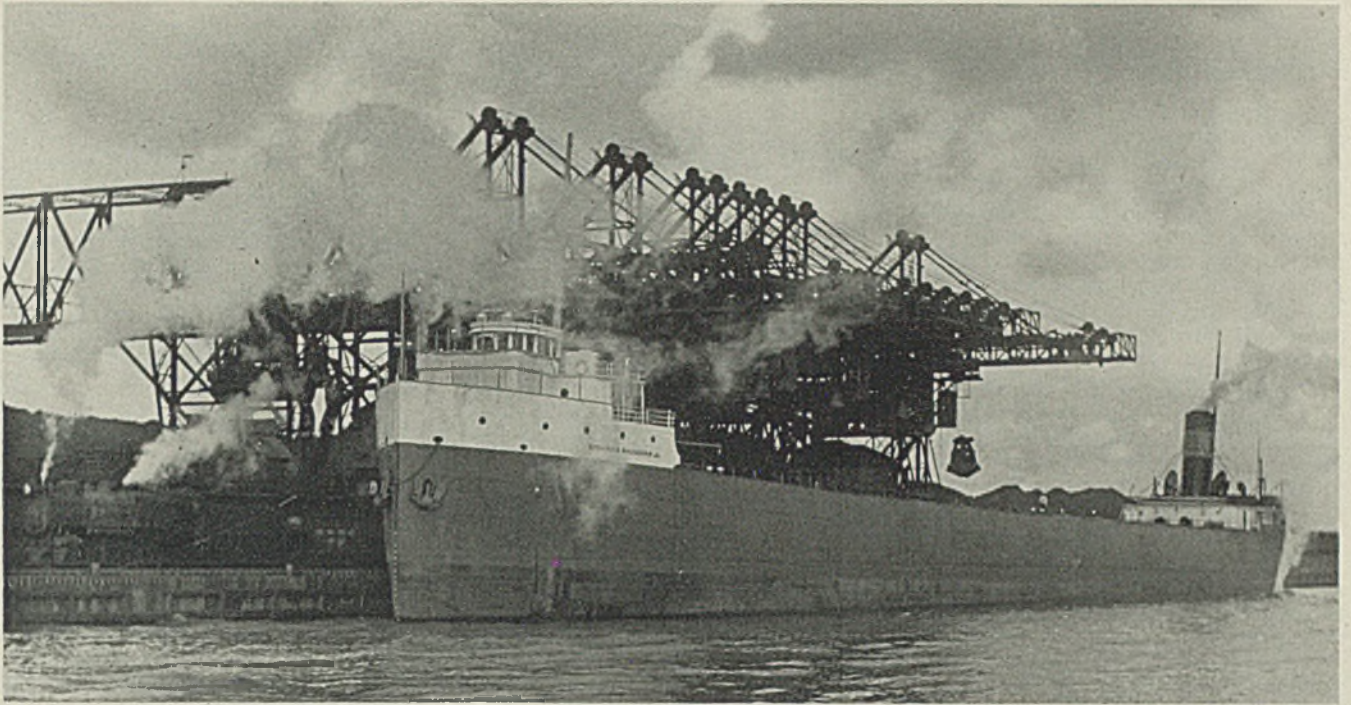
To provide a check on the ships that are outside the ore trade, the order provides that no ship of any kind, without general or special permit of the ODT, shall transport grain from (a) any port, point or place on Lake Michigan; (b) from Fort William or Port Arthur, Ont., or from any other Canadian "port, point or place on the Great Lakes."

"Diversion of grain tonnage to the railroads," Mr. Eastman said, "will be necessary in order to assure maximum carrying capacity for iron ore. Certain adjustments will probably have to be made in railroad operations to handle the added burden, but thus far the railroads have met every freight emergency with remarkable efficiency. I am confident that I can count on them in this instance."

ODT's order in defining the type of vessel restricted from grain traffic, includes "any ship, whether or not self-propelled, having a gross

(Please turn to Page 52)





## Backing Up — or Going Ahead?

THE WAR on the Atlantic last week came more directly to affect shipping on Great Lakes. Because of difficulties in "bridging" the ocean with munitions and food, facilities along the Atlantic seaboard for handling grain from the Northwest were reported overtaxed.

Lake vessels as usual have been transporting grain. The order was given to use them only for iron ore. Sufficient grain, for the present, will move "all-rail".

The grain situation, plus need for a formidable tonnage of ore this season, accounted for the regulation.

It is expected to facilitate the movement of ore, for which demand points up to 90,000,000 tons.

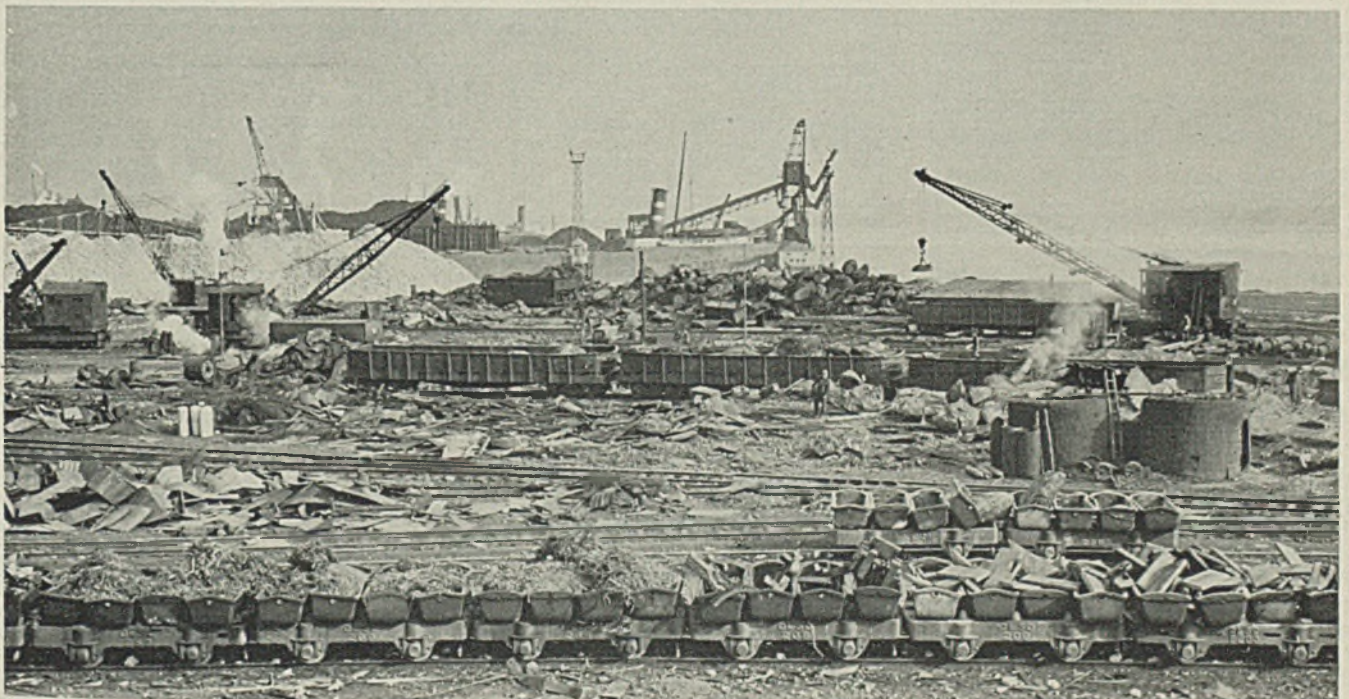
With only seven additional vessels so far this year in the fleet of 299 United States ore carriers on the lakes, the government wants nearly a 10 per cent in-

crease in deliveries. The 16 vessels ordered by the Maritime Commission will not be ready until 1943. Some of U. S. Steel's new carriers will be available for part of this season. Canadian fleet of 53 vessels may carry a million more tons to American ports this year.

Just as the grain movement has been "backing up", shippers believe ore may be "backed up" this fall when lake docks and furnace areas are overflowing.

They point out that capacity for consuming ore recently has far outstripped means for handling it after it arrives in lower lake harbors. They say this "bottle-neck" requires immediate attention.

While ore piles are growing in size, steelworks scrapyards (lower example) still are lean. Facilities are not interchangeable. The drive for ore and scrap indicates that "raw materials" now are "critical" materials.





## Drive for Raw Materials

(Concluded from Page 50)

register tonnage of 1000 tons or more, documented under the laws of the United States or owned by a citizen of the United States, which transports or which is capable of transporting cargo in bulk, but shall not include ships equipped with self-unloading devices." There are 35 of this latter class shown in the registry.

"Every person owning, controlling or operating a vessel on the Great Lakes, or their connecting or tributary waters," the order provides, "shall prepare and maintain such records and make such reports as this office may hereafter require." This section of the order includes all vessels whether used in ore transport or in the movement of other cargo.

Ore shipments for April totaled 7,789,182 gross tons, 12 per cent above last year's April tonnage of 6,918,914. Aided by the earlier start, in March, shipments to May 1 totaled 8,581,740 tons, or 1,626,947 tons more than in 1941.

Figures for April are as follows:

Port	April, 1942	April, 1941
Escanaba	695,007	491,525
Marquette	574,885	768,448
Ashland	789,312	758,426
Superior	2,603,385	2,081,341
Duluth	1,753,005	1,675,322
Two Harbors	1,373,588	1,143,852

Total U. S. Ports	7,789,182	6,918,914
Michigan	.....*	35,879

Grand total	7,789,182	6,954,793
Increase from year ago	.....	834,389

For the season to date, tonnages are as follows:

Port	To May 1, 1942	To May 1, 1941
Escanaba	771,291	491,525
Marquette	700,574	768,448
Ashland	818,529	758,426
Superior	2,920,141	2,081,341
Duluth	1,861,566	1,675,322
Two Harbors	1,509,639	1,143,852

Total U. S. ports	8,581,740	6,918,914
Michigan	.....*	35,879
Grand total	8,581,740	6,954,793
Increase from year ago	.....	1,626,947

\*Canadian figures not yet available.

## Strike Halts Production At Wire Rope Plant

A strike declared to be unauthorized by the Steel Workers' Organizing Committee last week shut down the Williamsport Wire Rope plant of Bethlehem Steel Co. at Pittsburgh. Local SWOC officials blamed the strike on failure of the company to meet demands reported to have been made by workers on Dec. 24.

## Four-Month Steel Output 28,161,202 Tons, 4% Over '41

PRODUCTION of 7,122,313 tons of steel ingots and castings during April, as announced by the American Iron and Steel Institute, brought total steel output in the first four months this year more than 4 per cent over tonnage produced in the corresponding period of 1941.

The total for the first four months this year was 28,161,202 tons, compared with 27,030,888 tons in the corresponding months of 1941. Production in April this year exceeded by almost 5½ per cent the total of 6,754,179 tons produced in April a year ago.

Steel output last month was slightly below the record output of 7,392,911 tons achieved in the longer month of March.

An average of 1,660,213 tons of steel per week was produced during April, only one-half of one per cent below the peak of 1,668,829 tons per week in March. In April a year ago,

an average of 1,574,401 tons of steel was produced per week.

During the past month the steel industry operated at an average of 97.7 per cent of rated capacity, against 98.2 per cent of capacity in March. In April, 1941, the industry operated at 97.6 per cent of a considerably smaller total capacity than is available today.

### April Plate Shipments Set Record at 895,971 Tons

April plate shipments totaled 895,971 tons, compared with 878,726 tons in March, C. E. Adams, chief, WPB Iron and Steel Branch, announced last week. Strip mills produced 337,519 tons of the April total, an increase of 31,324 tons over March.

Shipments for the Maritime Commission met requirements for the second consecutive month, and exceeded 280,000 tons.

While increased production is easing the situation slightly and the strip mills are helping meet requirements, Mr. Adams said permanent solution to the troublesome plate problem depended on new plate mill capacity coming into production.

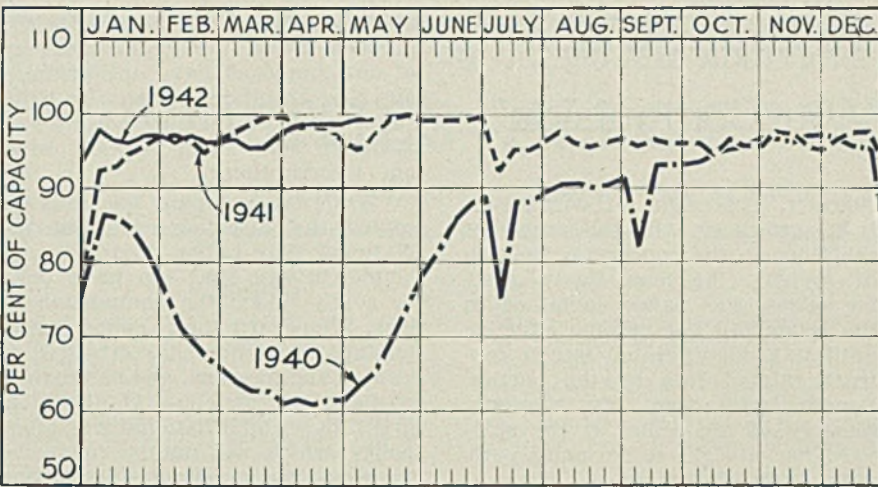
### STEEL INGOT STATISTICS

	Estimated Production—All Companies						Calculated			
	Open Hearth		Bessemer		Electric		Total	weekly Number of		
	Net of tons capacity	Per cent	Net of tons capacity	Per cent	Net of tons capacity	Per cent	production, all companies in Net tons month			
Based on Reports by Companies which in 1940 made 98.43% of the Open Hearth, 100% of the Bessemer and 85.82% of the Electric Ingot and Steel for Castings Production										
1942										
Jan.	6,328,128	95.4	490,864	86.0	305,930	96.3	7,124,922	94.7	1,608,335	4.43
Feb.	5,791,813	96.7	453,543	88.0	275,700	96.2	6,521,056	96.0	1,630,264	4.00
Mar.	6,574,701	99.1	493,294	86.4	324,916	102.3	7,392,911	98.2	1,668,829	4.43
1st quar	18,694,642	97.0	1,437,701	86.7	906,546	98.3	21,038,889	96.3	1,635,994	12.86
April	6,346,707	98.8	454,583	82.2	321,023	104.4	7,122,313	97.7	1,660,213	4.29
Based on Reports by Companies which in 1940 made 98.43% of the Open Hearth, 100% of the Bessemer and 85.82% of the Electric Ingot and Steel for Castings Production										
1941										
Jan.	6,274,780	99.0	451,806	76.0	195,766	89.1	6,922,352	96.8	1,562,608	4.43
Feb.	5,669,425	99.1	378,536	70.5	182,393	91.9	6,230,354	96.5	1,557,589	4.00
Mar.	6,457,641	101.9	460,225	77.4	206,137	93.8	7,124,003	99.6	1,608,127	4.43
1st quar	18,401,846	100.1	1,290,567	74.8	584,296	91.6	20,276,709	97.7	1,576,727	12.86
April	6,137,613	100.0	395,056	68.6	221,510	104.1	6,754,179	97.6	1,574,401	4.29
May	6,362,245	100.4	444,079	74.7	238,241	108.4	7,044,565	98.5	1,590,195	4.43
June	6,098,171	99.4	458,848	79.7	235,732	110.8	6,792,751	98.1	1,583,392	4.29
2nd qtr	18,598,029	100.0	1,297,983	74.3	695,483	107.8	20,591,495	98.1	1,582,744	13.01
1st half	36,999,875	100.0	2,588,550	74.6	1,279,779	99.7	40,868,204	97.9	1,579,753	25.87
July	6,085,100	94.4	489,297	85.0	237,827	85.7	6,812,224	93.3	1,541,227	4.42
Aug.	6,244,353	96.6	495,761	85.9	257,382	92.6	6,997,496	95.6	1,579,570	4.43
Sept.	6,054,418	96.9	500,768	89.8	256,568	95.5	6,811,754	96.3	1,591,531	4.28
3rd qtr	18,383,871	96.0	1,485,826	86.9	751,777	91.2	20,621,474	95.1	1,570,562	13.13
9 mos.	55,383,746	98.6	4,074,376	78.6	2,031,556	96.4	61,489,678	96.9	1,576,658	39.00
Oct.	6,423,329	99.4	533,060	92.4	279,679	100.6	7,236,068	98.9	1,633,424	4.43
Nov.	6,194,679	99.0	488,822	87.5	277,384	103.0	6,960,885	98.2	1,622,584	4.29
Dec.	6,387,865	99.0	481,813	83.7	280,637	101.2	7,150,315	97.9	1,617,718	4.42
4th qtr	19,005,873	99.1	1,503,695	87.8	837,700	101.6	21,347,268	98.3	1,624,602	13.14
Total	74,389,619	98.8	5,578,071	80.9	2,869,256	97.9	82,836,946	97.3	1,588,741	52.14

The percentages of capacity operated in the first six months of 1941 are calculated on weekly capacities of 1,430,102 net tons open hearth, 134,187 net tons bessemer and 49,603 net tons electric ingots and steel for castings, total 1,613,892 net tons; based on annual capacities as of Dec. 31, 1940 as follows: Open hearth 74,565,510 net tons, bessemer 6,996,520 net tons, electric 2,586,320 net tons. Beginning July 1, 1941, the percentages of capacity operated are calculated on weekly capacities of 1,459,132 net tons open hearth, 130,292 net tons bessemer and 62,761 net tons electric ingots and steel for castings, total 1,652,185 net tons; based on annual capacities as of June 30, 1941 as follows: Open hearth, 76,079,130 net tons, bessemer 6,793,400 net tons, electric 3,272,370 net tons.

The percentages of capacity operated in 1942 are calculated on weekly capacities of 1,498,029 net tons open hearth, 128,911 net tons Bessemer and 71,682 net tons electric ingots and steel for castings, total 1,698,622 net tons; based on annual capacities as of Jan. 1, 1942 as follows: Open hearth 78,107,260 net tons, Bessemer 6,721,400 net tons, electric 3,737,510 net tons.





## PRODUCTION . . . . . Steady

PRODUCTION of open-hearth, bessemer and electric-furnace ingots last week was unchanged at 99 per cent. Three districts advanced, two declined and seven were steady. A year ago the rate was 97½ per cent; two years ago it was 66½ per cent, both computed on capacities at those dates.

**Youngstown, O.** — With 74 open hearths and three bessemer in production the rate last week continued at 94 per cent. Scrap supply is better. A blast furnace at Ohio works of Carnegie-Illinois Steel Corp. suspended last week for relining, planned to be completed in 40 days. Schedule for this week is 94 per cent.

**Chicago** — Advanced ½-point to 105½ per cent, a new all-time record, the prior mark being 105 per cent. Since the third week in March production has not been below 104 per cent. The present rate is regarded as practically the top.

**Detroit**—Declined 2 points to 90 per cent, scrap supply and furnace repairs causing the drop.

**St. Louis** — Addition of an open hearth increased the rate 7½ points

to 95 per cent, with further rise to follow as open hearths are repaired.

**Cincinnati** — Held at 89 per cent, with adequate scrap supply but furnace repairs preventing a higher rate.

**Cleveland** — Removal of an open hearth by one interest and slight curtailment by another caused the rate to decline 5 points to 88½ per cent.

**Buffalo** — After reaching 95 per cent for a day, removal of an open hearth dropped the rate to 93 per cent.

**Central eastern seaboard**—Better scrap supply permitted an increase of 1 point to 95 per cent.

**New England** — Pending completion of open-hearth repairs production held at 93 per cent.

**Wheeling** — Steady at 82½ per cent for the seventh consecutive week.

**Pittsburgh** — Unchanged at 95½ per cent, which has been the rate for the past four weeks.

**Birmingham, Ala.** — Remained at 95 per cent of steelmaking capacity, with 23 open hearths active.

### “Minute Man” Flag Is Awarded Inland Steel

Treasury Department awarded the blue “Minute Man” flag to Inland Steel Co.’s Chicago office employes for 100 per cent subscription to war bonds May 2. The 350 employes currently are buying \$15,000 of bonds a month.

Employes in the armed services also were honored at the ceremony and the flag was presented to employes who have sons in the services.

## OPA Will License All Scrap Dealers Under Price Law

WASHINGTON

IN THE first action of its kind the OPA last week ordered licensing before June 20 of all scrap dealers selling to industrial consumers.

Effective May 20, the licensing order covers dealers selling to industrial consumers waste, scrap or salvage materials for which maximum prices have been established.

The order automatically licenses all dealers in scrap on May 20 but requires actual registration by June 20.

Officials said this order marks the first instance of application of OPA licensing authority to a specific industry. Retailers and wholesalers generally are licensed by provisions of the General Maximum Price Regulation.

The new regulation affects dealers in aluminum, zinc, iron and steel, brass, copper and copper alloy and lead scrap, waste paper, old rags, rayon waste, silk waste and raw and processed wool waste materials.

Price Administrator Henderson warned that dealers violating price schedules or other regulations on these materials would have their licenses suspended under terms of the Price Control Act. This would mean that the dealer would lose his privilege to do business, Henderson said. He declared that further activity after the license had been suspended would violate the Price Control Act and would subject the offender to civil and criminal prosecution.

### “Victory Scrap Drive” Brings Metals for 18 Light Tanks

Enough iron and steel scrap to produce steel for 18 light tanks has been collected in a “Victory Scrap Yard” at Coatesville, Pa. The accumulation is the result of an intensive drive started April 13 to gather all the city’s scrap metals, rubber, paper, and rags. In the collection are 200 tons of metals.

Contributions range from stoves, beds and toys to automobiles, baby carriages and old cannon balls. Among the prizes are a piece of iron from OLD IRONSIDES, and a German helmet from the last war.

Already the sale of paper and rags has amounted to nearly \$500. Scrap metal is expected to bring about \$3000, which will be turned over to the Coatesville Red Cross.

### District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended		Same week	
	May 9	Change	1941	1940
Pittsburgh	95.5	None	94	61.5
Chicago	105.5	+ 0.5	101.5	65.5
Eastern Pa.	95	+ 1	95	57
Youngstown	94	None	95	53
Wheeling	82.5	None	88	88
Cleveland	88.5	- 5	96.5	71
Buffalo	93	None	90.5	58
Birmingham	95	None	90	83
New England	93	None	90	53
Cincinnati	89	None	89	61
St. Louis	95	+ 7.5	98	45
Detroit	90	- 2	88	70
Average	99	None	*97.5	*66.5

\*Computed on basis of steelmaking capacity as of those dates.



# Federal Shipbuilding To Grant Union Maintenance "Under War Compulsion"

"SOLELY because of the war emergency and this country's great need of ships in order successfully to prosecute the war", Federal Shipbuilding & Dry Dock Co., Kearny, N. J., last Friday yielded to the recent directive of the War Labor Board and agreed to sign a "maintenance of membership" agreement with a CIO union.

L. H. Korndorff, president of Federal, a United States Steel Corp. subsidiary, notified the WLB and the Industrial Union of Marine and Shipbuilding Workers of America, of the company's decision. To the public, Mr. Korndorff explained the company's action as follows:

"For nearly a year past, Federal Shipbuilding & Dry Dock Co. has steadfastly defended the freedom of the American worker to choose for himself whether or not he wishes to become and to remain a member of a labor union. Our firm belief in the soundness of that fundamental principle remains unchanged.

## Imposed by WLB Order

"The determination of the National War Labor Board, reached by an 8 to 4 vote, imposes 'maintenance of membership' upon those employes of this company who are members of the union in good standing at the time the new labor contract is signed and also upon those employes who voluntarily become members of the union after the signing of the new contract. All of these employes must thereafter maintain their membership in the union in good standing during the life of the new contract, which will expire on June 23, 1943, or be discharged from their employment at the shipyard. Any employe who wishes to escape such penalty of being so discharged may do so, under the terms of such 'directive order', by requesting this company, in writing, to deduct from his pay each month and pay to the union a sum equivalent to his union dues and any fines imposed by the union.

"Before the new labor contract is signed, which will not be earlier than ten days from now, any present member of the union, who does not wish to be bound by such 'maintenance of membership' provision, may withdraw from the union by giving notice to that effect to the union. Any member of the union so withdrawing will not be subject to such 'maintenance of membership' provision of the new

contract. This right of withdrawal is in accordance with the statement contained in the concurring opinion of (WLB) Chairman Davis, reading 'Thus, the clause contained in the order will not become effective until it is incorporated into a contract entered into by the parties. Pending such time, any individual member of the union at the shipyard has a right to formally withdraw from the union.'

"In the opinion of counsel, this right of withdrawal from the union, as so stated by Chairman Davis, prevents this determination of the National War Labor Board from being contrary to the provisions of the National Labor Relations Act. An employe, who is now a member of the union, is thus given the opportunity to decide for himself whether or not he is to be bound for the duration of the contract by this 'maintenance of membership' provision. An employe who may voluntarily join the union in the future will have made his individual decision on this matter before



L. H. Korndorff

he so becomes a member of the union. Dr. Graham stated in the majority opinion of the board that 'the freedom of choice of the individual worker is protected by a provision already in the contract against any coercion of a worker into membership in the union.'

"This company's record of volume and speed of construction of needed naval and merchant vessels is second to none. Since the unconditional return of our shipyard by the Navy Department on Jan. 6, 1942, there has been no interference with or retarding of the production of ships as a result of this 'maintenance of membership' issue or any other

unsettled labor difficulty. In the present crisis, the great majority of our employes have one primary aim and ambition. That is to build ships and more ships to win the war—and to build them fast and without interruption.

"While this company has thus accepted the 'directive order' of the National War Labor Board, we are bound to say that we have done so solely under the compulsion of war. We regard the so-called 'maintenance of membership' directive as unwise and unsound, and as tending, without the sanction of the Congress, to set up a national war labor policy, which will not be conducive to obtaining maximum production at the Kearny shipyard.

"But we are at war. There is imperative need for ships and more ships. The prolongation of this controversy might result in serious loss of production. The National War Labor Board, acting under the authority conferred in it by the President, has issued a directive order in this case, which, we are advised, may be complied with without violating the law. Much as we differ with the majority of the board on matters of fact as well as of policy, we recognize the board as the final arbiter of labor disputes within the law. First, last and all the time, the winning of the war must be the paramount objective of all of us who want to save America and our free institutions."

## More Companies Honored For Production Excellence

Additional metalworking companies have been honored by the United States Navy for excellence in production of vitally needed war materials.

Wyckoff Drawn Steel Co., Pittsburgh, has received the all-Navy "E" Burgee. Company originally received the "E" award in January and has broken production records monthly since then.

The all-Navy "E" also has been awarded the Electric Storage Battery Co., Philadelphia.

Broderick & Bascom Rope Co., St. Louis, received the "E" award April 30.

First company in Oakland, Calif., to receive the honor was the Grove Regulator Co.

Three Connecticut plants of the American Brass Co., at Torrington, Waterbury and Ansonia, were awarded the flag May 6. Gen. Douglas MacArthur cabled congratulations from Australia.

Hubbard Co., Pittsburgh; Hurley Machine Division, Electric Household Utilities Corp., Chicago; and Automatic Transportation Co., Chicago, also are recent recipients.



# PRIORITIES-ALLOCATIONS-PRICES

as published in Section Two of STEEL, April 20, 1942

## "M" ORDERS

**M-1-d (Amendment): Aluminum Scrap**, effective May 2. Requires maker of segregated scrap to furnish buyer with signed statement showing specification, form, weight, and name and address of plant where scrap was generated. Permits sale of segregated scrap of copper quality alloy to dealer or approved smelter as well as to producer up to 5000 pounds monthly.

**M-11 (Amended): Zinc**, effective June 1. Places metallic zinc under complete allocation control. Buyers apply monthly to director of industry operations for allocation certificate, dealers using PD-450 and all other consumers PD-94-a, both due by 15th of each month. M-11-a, effective June 1, places zinc oxide and zinc dust under pool arrangement. M-11-k establishes May pool at 75% of January production for high grade and special high grade metallic zinc; 50% of January production for all other grades; zinc oxide pool 10% of January production.

**M-21-b (Amendment): Steel Warehouses**, effective May 2. Forbids steel shipments by warehouses on ratings lower than ratings A-10 except in specified cases. Provides A-1-k rating to deliveries of Schedule A steel products to warehouses; A-3 rating for deliveries of Schedule B products. Application for Schedule A quotas made on PD-83A. Warehouses must report to Bureau of Census by 15th of each month on PD-83 in regard to Schedule A products and to WPB on PD-83-f for Schedule B products.

**M-38-h: Lead**, effective May 1. Sets May lead pool at 15% of March production.

**M-41 (Amended): Chlorinated Hydrocarbon Solvents**, effective May 2. Extends A-10 ratings for solvents used in various products, including cleaning of metal parts of electrical equipment and for degreasing machines used in manufacture of war materials. Assigns B-2 rating for degreasing other machines and for manual cleaning of other than metal parts of electrical equipment.

**M-63 (Amendment): Imports of Strategic Materials**, effective May 4. Adds beryll and beryllium ores, metallic beryllium and beryllium oxides and salts to list of exports which are prohibited except under existing contracts.

**M-81 (Amendment): Tin Plate and Ternu Plate**, effective April 30. Permits use of tin plate usable only for food cans of sizes restricted by original regulations, if sheets were on hand Feb. 11. Extends indefinitely terms of all general telegraphic exceptions to the order issued since Feb. 11.

**M-126: Iron and Steel Use**, effective May 5, 1942. Permits receipt of iron and steel for 15 days for manufacture of more than 400 common civilian products; processing for 45 days up to 75% of average rate of use of all metals in 1941; assembly of these products for 90 days. All use of iron and steel in making such products prohibited thereafter. Certain items may be made for Army, Navy, Maritime Com-

mission for 90 days. Manufacture of roofing and siding permitted for certain purposes for remainder of 1942 at 20% of 1940 output. Appeals filed on PD-37 with WPB field offices.

**M-128: Zinc Sulphide Pigments**, effective May 5, 1942. Requires manufacturers to set aside certain percentage of production for allocation in following month.

**M-143: Indian Kyanite**, effective May 6, 1942. Includes andalusite and sillimanite. Provides complete allocation. Suppliers and consumers using kyanite to make refractories file PD-466 by 20th each month with WPB.

**M-144: Fuel Oil**, effective May 5, 1942. Permits sales and deliveries of fuel oil without regard to preference rating previously issued. Ratings may be assigned for purchases only by ocean-going vessels.

## "L" ORDERS

**L-4 (Amendment): Automotive Repair Parts**, effective May 5, 1942. Sets maximum production between April 1 and Sept. 30 at 70% dollar volume sold in corresponding 1941 period. Only parts essential to operation of vehicle permitted to be made.

**L-21-a (Amendment): Coin-Operated Machines**, effective May 2, 1942. Permits makers of automatic phonographs and other amusement machines who have inventories of raw materials and parts to dispose of such stocks to fill orders rated higher than A-2.

**L-23-b: Domestic Electric Ranges**, effective May 2, 1942. Forbids disposal of ranges except on orders rated A-9 or higher. Permits iron and steel use during May in amount equal to monthly use in year ended June 30, 1941. Prohibits range production after June 1 except to fill orders rated A-1-k or higher. Replacement parts not affected.

**L-33 (Amendment): Portable Electric Lamps, Shades**, effective April 30, 1942. Extends to May 31 period in which metal parts, lamp cords and silk may be used in making lamps and shades, provided material was at least partially fabricated and in inventory of manufacturer or supplier prior to March 23, 1942. May production quota fixed at 30% of average 1940 rate.

**L-39 (Amendment): Fire Protective Equipment**, effective May 5, 1942. Extends freezing of 2 3/4-inch brass fire-hose couplings in hands of distributors as well as of manufacturers.

**L-63 (Amendment): Suppliers' Inventories**, effective May 5, 1942. Permits stock replenishment of specific items in amount equal to sales of those items the preceding month, even though total inventory exceeds maximum permitted by the order. Amendment, May 4, exempts supplies made of aluminum from provisions of order.

**L-77 (Amendment): Metal Windows**, effective April 28, 1942. Permits manufacture of basement and residential casement windows composed wholly of materials in stock prior to March 25 for use in rated housing projects. Any metal window may be made until May 15 on orders received before March 26, or for use in rated project. After May 1, deliveries of material

for making metal windows must be made under Production Requirements Plan.

**L-82: Construction Equipment**, effective May 2, 1942. Prohibits lease or disposal of new power cranes and shovels without authorization of Director of Industry Operations. PD-448 used to seek release. Production after June 1 must be approved by the Director. Production schedules filed on PD-446. L-82-a, effective May 2, prohibits lease or disposal of rubber-tired construction equipment without authorization requested on PD-448, except for previous orders rated higher than A-2 and on which shipments must be made before June 2.

**L-94: Electric Power**, effective May 1, 1942. Requires utilities to produce maximum amount of power from present capacity through integration of various systems, and establishes program for mandatory curtailment of power for certain customers in event of shortage.

**L-97-a-1: Railroad Equipment**, effective April 29, 1942. Cancels ratings of A-2 or lower on materials for freight car construction and permits builders to sell any material on hand or in transit to other freight car builders.

**L-106: Copper Use in Motor Vehicles**, effective May 5, 1942. Prohibits use of copper or copper alloys in making all but essential operating parts.

## "E" ORDERS

**E-1-b: Machine Tools**, effective May 1, 1942. Apportions 75% of monthly deliveries to Service purchasers and 25% to foreign buyers and essential domestic and Canadian industries. Foreign orders given blanket A-1-a rating, requiring no preference rating certificates, but orders must be placed through Army Ordnance Department or Treasury Department. New master preference list covers sequence of deliveries to Service purchasers (Army, Navy, Maritime Commission).

## PRICE SCHEDULES

**No. 8 (Amendment)—Scrap and Secondary Nickel**, effective April 28, 1942. Requires imports of such material to be sold at not more than maximum prices provided for domestic scrap. Amendment, issued April 30, effective as of April 15, excepts from provisions of the schedule purchases by Metals Reserve Co. of stocks of metallic nickel frozen by M-6-b.

## New Designs Expected To Effect 10 Per Cent Saving in Structural

WPB's Bureau of Industrial Conservation is working on an order calling for a higher unit stress in the design of steel structures. This move is expected to save as much as 10 per cent of required structural steel. It will affect tension members only; factors of safety in column design will not be changed. The new specifications soon are to be promulgated by the American Institute of Steel Construction.

For additional revisions and additions please see STEEL of April 27, p. 30, May 4, p. 46.



# Windows of WASHINGTON

**Aluminum and magnesium plant construction given green light for deliveries of materials . . . Copper prohibited in all but working parts for motor vehicles . . . Imported Indian kyanite placed under strict control . . . Four more governments extended priority assistance . . . War authorizations now aggregate \$162 billion . . . WPB ready to conserve electric power as shortages threaten**



By L. M. LAMM

Washington Editor, STEEL

## WASHINGTON

SUPPLIERS of materials used in the construction of vital aluminum and magnesium plants have been advised by the WPB that deliveries should be made on schedule even though subsequent orders assigned under Preference Rating Order P-19-i carry higher preference ratings.

The ruling was made in Interpretation No. 1 of P-19-i which covers materials used in essential civilian construction. It was necessary, the board said, to prevent any delay in delivery which might result from a misunderstanding of the original order.

The paragraph in question covered protection of delivery dates and the rating applied under it was presumably high enough to assure delivery of material by a certain date. It provided that after any A-1-b rating has been applied to any delivery, "such delivery shall not be deferred or otherwise postponed by the application of any other preference rating, whether higher or not, assigned by any order or certificate whatsoever, except as the Director of Industry Operations may specifically direct."

"The effect of this paragraph," the interpretation ruled, "is that a supplier who has accepted an order to which a specified rating has been applied under a serial number of P-19-i, must not defer deliveries on that order in favor of deliveries under an order accepted later, even if the later-accepted order bears a higher rating. . . ."

"This provision does not require or permit a supplier to make deliveries on an order to which a rating has been assigned under P-19-i in preference to deliveries on earlier-accepted orders bearing equal or higher ratings."

### Prohibit Copper in All but Operating Parts for Vehicles

WPB has prohibited use of copper or copper base alloy products in the manufacture of all but essen-

tial operating parts of motor vehicles.

Limitation Order L-106, effective immediately, sets forth 13 uses to which the products may be put.

On the basis of production last year, the order is designed to reduce consumption of copper and copper base alloy products in replacement parts for passenger cars and light trucks this year by 23 per cent below 1941 consumption, and by 31 per cent in the manufacture of parts for medium and heavy trucks, truck trailers and buses.

Restrictions do not apply to the production of parts for the Army or Navy where use of copper or copper base alloy products is required by the specifications of the prime contract.

Unless specifically authorized by the Director of Industry Operations, producers are prohibited from using the restricted products except in the following:

Radiators; cooling system control devices; electrical equipment; tubing and fittings; bearings, bushings, thrust washers, and similar parts; carburetor parts; plating; gaskets; certain types of transmissions; brazing materials; powdered copper for briquetted bearings; as alloying elements in certain parts, and in some miscellaneous parts, including keys and lock tumblers.

### Indian Kyanite Under Strict Allocation Control

Indian kyanite (including andalusite and sillimanite), a super-duty refractory used in furnaces where extremely high temperatures are necessary, has been placed under complete allocation control by WPB.

Order M-143 provides that delivery, consumption and processing of Indian kyanite, both future imports and present stocks in the United States, are subject to specific authorization. Consumption is restricted to necessary uses.

Indian kyanite is an aluminum silicate able to withstand the high temperatures necessary for linings

of furnaces to make electric furnace steel, aluminum, copper, certain types of pottery, and optical glass. While kyanite is found in a number of states in this country, it is of lower quality and cannot be substituted entirely for the type found in India. Several other natural domestic substitutes are being considered and a study is being made of a synthetic substitute. Meantime, strict control over Indian kyanite is necessary.

Suppliers and consumers using kyanite in the manufacture of a refractory must file with the WPB before the 20th of each month, including May, a report on Form PD-466.

The order is effective immediately and will continue in effect until revoked.

### Discontinue Reports, Forms Required Under P-19 Orders

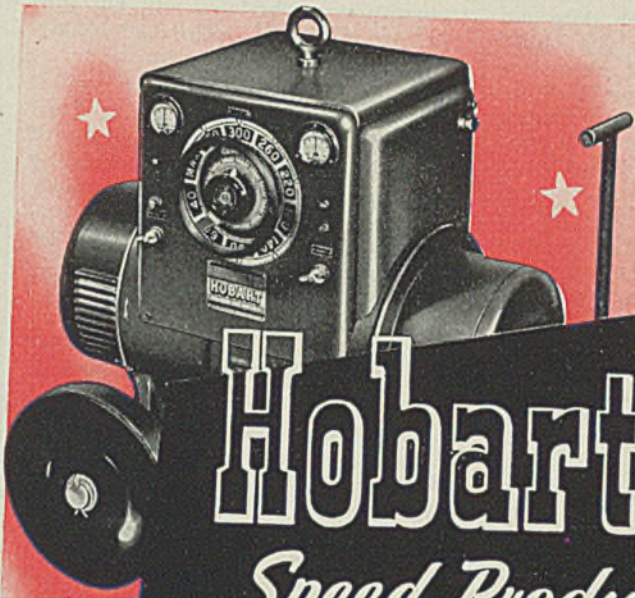
As a further step toward eliminating forms and reports, which are no longer considered necessary, the WPB Director of Industry Operations has amended Priorities Regulation No. 8 to discontinue reports required in connection with construction project rating orders of the P-18 series.

By Amendment No. 2 of Priorities Regulation No. 8, orders P-19, P-19-a, P-19-e, and P-19-h, in connection with which certain reports on PD forms have been required in the past, are removed from Appendix B.

### Priority Aid Extended to Four More Governments

Czechoslovakia, Free France, Iceland and Turkey have been added to the list of countries whose government orders are defined as "defense orders" under the terms of Priorities Regulation No. 1 as





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amended, by amendment No. 2 to the regulation.

Government orders from these countries are automatically assigned a preference rating of A-10 if no higher rating has been assigned by certificate or otherwise, and that such orders must be accepted and placed in production schedules in accordance with the rating.

### U. S. War Authorizations Aggregate \$162,416,000,000

War funds made available by Congress or the Reconstruction Finance Corp. since June, 1940, totaled \$162,416,000,000 when President Roosevelt signed the Sixth Supplemental War Appropriation Act of 1942 on April 28. This act carried cash appropriations and net contract authorization of \$19,138,000,000.

The \$162,416,000,000 total includes approximately \$6,000,000,000 for the

Navy Department, which does not become available for spending until fiscal 1943, and has not been allocated officially for specific purposes. The total does not include \$4,096,000,000 contracted by foreign governments for war production in the United States.

The most important item of expenditure provided for in the latest appropriation is \$8,761,000,000 for airplanes. Posts, depots and stations call for \$6,123,000,000, virtually double the amount previously appropriated for such purposes. Miscellaneous munitions and supplies covered in the act came to \$2,268,000,000.

The act also includes: \$750,000,000 for pay, subsistence and travel of the armed forces, \$728,000,000 for ordnance, \$348,000,000 for industrial facilities, \$31,000,000 for naval ships and \$129,000,000 for miscellaneous expenditures.

curtailment schedules and put into operation any or all of the following power-saving programs:

1. Eliminate all nonessential lighting, such as sign lighting, show window lighting, flood lighting of athletic fields, and restrict lighting in stores and other public establishments to one watt per square foot of floor space. This would permit not more than fifty 100-watt bulbs in a store with a floor space of 50 x 100 feet.

2. Restrict or prohibit the use of electric power during peak periods. Such action would affect all consumers.

3. Limit delivery of power to an industrial customer to a power usage which will be based on a percentage of his highest demand during the 12 months from May 1, 1941, to April 30, 1942.

4. Restrict the consumption of large nonresidential consumers using more than 2500 kilowatt hours a week to a weekly quota based on a percentage of their power consumption in April of 1942 or any other period fixed by the WPB.

5. Restrict the consumption of consumers (residential and small commercial) using 2500 or less kilowatt hours on a basis to be fixed at the time of the shortage.

### Executive Appointments Announced in War Board

Wendell Lund, Detroit, will head the new WPB Labor Production Division, Chairman Donald M. Nelson has announced. WPB operations having to do with labor relations and staff activities bearing on production will be continued without interruption, Mr. Nelson said.

Mr. Lund, thirty-six years old and a native of Escanaba, Mich., has been executive director of the Michigan Unemployment Compensation Commission during the recent automobile conversion program.

William H. Harrison, WPB Production Division director, has appointed Harold E. Talbott and George C. Brainard to newly created positions of deputy directors of the division.

Mr. Talbott will direct the activities of the present Aircraft Branch, the chief of which is Merrill C. Meigs, and a newly formed Radio and Radar Branch. He has been with the WPB for the last two months as special advisor to Donald M. Nelson. Mr. Talbott is on leave as chairman of the executive committee of the Electric Auto-Lite Co., Toledo, O.

Mr. Brainard has been in charge of the Machine Tools Branch since the first of the year and will continue to direct its activities. He is on leave as president of the General Fireproofing Co., Youngstown, O.

## WPB Prepares To Conserve and Ration Electric Power as Shortages Threaten

### WASHINGTON

ARRANGEMENTS to handle power shortages wherever and whenever they occur has been established by WPB.

It issued an Order L-94 which may affect every user of electric power in the country. In some areas shortages of electric power have already occurred, and in others further shortages are threatened. These shortages are generally caused by the vast increase in use of electric power by war industries, causing many systems to use their reserves in current operations, and reduce their margin in the event of breakdown, drought, fuel shortages, or other unfavorable conditions.

Purpose of the order is to assure a steady flow of power to war industries and essential civilian services by curtailing nonessential uses. Curtailment of electricity for regular consumers, however, will not take place until an area becomes a power shortage area.

Two main lines of action against power shortages are set out in the order. The first, which goes into operation at once, requires utilities to operate their systems in a way that will produce the maximum amount of power from their present capacity. In general, this calls for integrating or tying together the systems to permit transfer of power from one locality to another where the power is needed most.

The second part of the program, which will be put into operation

when and where a shortage occurs, establishes machinery for mandatory curtailment of power for commercial and industrial consumers. Provision is also made for curtailment of residential consumers.

The part of the order that goes into operation at once requires each utility to operate its facilities and interchange power with other utilities in a manner that will "achieve the maximum co-ordination of power supply for war production and essential civilian uses, and for relief of power shortages." Such operations include making available the maximum amount of power at peak periods, using water power as much as possible to save fuel, and maintain as much reservoir storage as possible.

Also under this part of the program, no utility is permitted to abandon any of its generating facilities except upon authorization by the WPB.

Each utility is required under the order to ascertain the amount and availability of any electric power generating facilities in the area owned by a nonutility power producer (such as an industrial plant with its own power plant), and make arrangements to connect such private capacity with the utility's system.

When a power shortage develops, WPB will define the power shortage area and issue specific directions to utilities, nonutility power producers and consumers to relieve the shortage. He will establish emergency



# WPB Ban on Iron and Steel in 400 Products To Accelerate Conversions

WASHINGTON

THOUSANDS of manufacturing plants which have been ordered by the WPB to stop using iron and steel in the manufacture of more than 400 common civilian products now face the necessity of converting to production of war materials or closing their doors.

The sweeping WPB order, General Conservation Order M-126, bans such common iron and steel items as bathtubs, pie plates, cash registers, waste baskets, cigarette lighters, clock cases, mail boxes and fountain pens.

It will affect not only manufacturing plants, but also wholesalers and retailers. In the Detroit region alone, it is estimated 17,000 companies will be affected.

Manufacturers whose products are included in the list now must re-examine their plants and facilities to determine their possibilities for making war materials, either as prime or subcontractors.

Limited production is permitted for 90 days, but after that manufacture must stop, even for many

items customarily used by the armed forces.

Manufacturers have 15 days to deliver or accept delivery of iron and steel to be used in the manufacture of any of the products listed in the order. For 45 days iron and steel may be processed for the manufacture of the items listed, up to an aggregate weight of 75 per cent of the average monthly weight of all metals processed by each manufacturer during 1941 in the making of each item. The processing must be completed within 45 days. For the next 45 days he may assemble items on the list. After that date all use of iron or steel in the manufacture of items on List A of the order must cease.

Manufacturers who have been making items on the list out of iron or steel may not turn to any other metal except gold or silver to make that article. During the 90-day period when fabrication and assemblage is permitted manufacturers may sell iron and steel to others engaged in the same line

of business. They may not sell iron and steel from inventory otherwise except on preference ratings of A-10 or higher for other than alloy steel and A-1-k or higher for alloy; to the Metals Reserve Co. or its agencies or with the specific authorization of the WPB Director of Industry Operations.

Also in the order is a List B, which applies only to Army, Navy or Maritime Commission orders. These may be processed, fabricated or assembled for 90 days from May 5 without restriction.

A special restriction is set up with regard to roofing and siding. This may be manufactured for the Army, Navy, Maritime Commission and certain other government agencies; for delivery on a preference rating of A-1-k or higher assigned by a PD-3a preference rating certificate or by a preference rating order in the P-19 series; for defense housing; for the manufacture of railway freight cars, streetcars, busses, trucks or trailers; or for delivery to a consumer for maintenance and repair purposes regardless of rating.

An entirely new appeals system is set up in the order. All appeals must be made on Form PD-37 and must be filed with the field office of the WPB for the district in which the plant to which the appeal relates is located.

## Official List of Products in Which Use of Iron and Steel Is Prohibited

### LIST A—GOVERNING DATE MAY 5, 1942

Access panels, except as required by Underwriters Code, Acoustical ceilings, Advertising novelties, Air-conditioning systems—except for hospital operating rooms and industrial plants, Amusement park devices and roller coasters\*, Area walls, Ash sieves, Asparagus tongs, Atomizers, perfume-boudoir, Attic fans, Autographic registers\*, Automobile accessories—except as required by law, Automotive replacement parts, nonfunctional, Awning frames and supports.

Bag, purse and pocketbook frames, Barber and beauty shop furniture, Baskets—except for commercial cooking and manufacturing uses, Bath tubs, B-B shot for air rifles, Beds—except hospital, Bed spring frames—except for hospital link fabric spring type bed, Beer kegs—except hoop and fittings for wooden kegs, Beer mugs, Beer stands, Beer steins, Bench legs—except industrial, Binoculars—except U. S. Government Agencies, Bird cages and stands, Bird houses and feeders, Biscuit boxes, Blackboards, Blade stoppers, mechanical, Bleachers and grandstands\*, Book ends, Bottle holders, Boxes and trays for jewelry, cutlery, combs, toilet sets, Bread racks, Bridge splash guards, Building ornaments, Butter chips, Butter knives

Cabinets—except: (a) Hospital operating and examining rooms, (b) Office furniture as permitted in Limitation Orders L-13-a and L-62; Cake cutters, Cake tongs, Candy display dishes, Canopies for electric brooders, Canopies and supports, Cans or containers for: Anti-freeze, under 5 gal. size; Artist supplies; Bullion cubes; Candy; Caviar; Chalk; Coffee; Gloves; Incense; Lawn seed; Nuts; Pencils; Pet food; Phonograph needles; Playing cards; Razor blades; Sponges; Staples; Tennis balls; Tobacco products; Toilet water; Yarn; Carpet rods, Carving set holders, Cash boxes, Cash registers\*, Casket hardware, Cattle stanchions—except hangers and fasteners, Cellings, Cheese dishes, Chicken crates, Chick

feeders, Christmas tree holders, Christmas tree ornaments, Cigar and cigarette holders and cases, Cigarette lighters, Cigar snippers, Clock cases—except on recording and controlling industrial instruments, Clothes line pulleys, Clothes line reels, Clothes racks and dryers, Clothes trees, Coal chute and door, household, Coal pans, Cocktail glasses, Cocktail sets, Cocktail shakers, Coffee roasting machinery, Compacts, Cooking stoves, commercial electric\*, Copy holders, Corn cribs, Corn poppers and machines, Counter tops, Croquet sets, Crumb trays, Culverts, Cupboard turns, Cups of all kinds, drinking, Curb guards.

Decorative iron products, Dictaphone racks, Dinner bells, Dishwashing machines\*—except hospitals, Dispensers, hand, for: Hand lotions; Paper products; Soap; Straws; Document stands, Door chimes, Door knockers, Door closers—except Fire prevention as required by Underwriters Code, Door handles—except shipboard use, Door stops, Drain boards and tub covers, household, Drawer pulls, Dress forms, Dummy police, Dust collecting systems and equipment\*—except on A-1-j or higher.

Ediphone racks, Egg slicers, Electric water coolers—except on PD-1a or PD-3a certificates, Enamel store fronts, Erasing knives, Escalators.

Feed troughs, Fence posts—except on A-2 or higher, Fences, chain link—except on A-2 or higher, Fences, ornamental, Finger bowls, Fireplace equipment—except dampers, Fireplace screens, Fish aquariums, Flagpoles, Flashlight tubes, Floor and ceiling plates for piping, Floor and counter covering trim, Floor polishing machines, Flour, salt and pepper shakers, Flower boxes, pot holders, and vases, Flower shears, Fly traps, Foot baths—except hospitals, Foot scrapers, Fountain pens—except functional parts, Fountains, ornamental, Furniture\*—except: (a) Wood furniture; (b) As listed in Limitation Orders L-13-a and L-62; (c) Hospital operating and examining rooms; (d) Hospital beds and cots.

Garage hoists, car lifts and racks, Golf bag supports, Grain storage bins—except strapping, hardware, and reinforcing materials, Grass shears, Grilles, ornamental; Sewers\*—except on A-2 or higher and reinforcing for concrete sewers, Gutters, spouting, conductor pipe, and fittings for single family dwellings.

Hair curlers, nonelectric, Hair dryers, Hand mirrors, Hangers and track for garage doors for private use, Hanger rings on brushes, brooms, etc., Hat frames, Hat-making machinery\*, Hedge shears, Helmets—except on A-2 or higher, Hose reels—except (a) Fire fighting equipment; (b) Industrial uses in direct fire hazard areas, House numerals.

Ice box exteriors—except portable blood banks, Ice cream freezers, household, Ice cube trays, Ink well holders, Incinerators—except industrial, commercial and as allowed in Defense Housing Critical List, Insulation, metal reflecting type.

Jam boxes, Jelly molds, Jewelry, Jewelry cases.

Kitchenware of stainless steel, Knitting needles.

Lard or vegetable oil tubs—except 5 lbs. and over and straps for wood containers, Laundry chutes, Laundry trays—except reinforcing mesh, Lavatories—except hangers, Lawn sprinklers, Letter chutes, Letter openers, Letter trays, Lighting poles and standards\*, Lipstick holders, Lobster forks, Lobster tongs, Lockers—except: (a) Oil refinery use; (b) Office equipment as limited by Limitation Order L-13-a, Looseleaf binding wire, rings, posts, and metal parts.

Mail boxes—except as required by U. S. postal regulations, Mailing tubes, Manicure implements, Marine hardware for pleasure boats, Marquees, Match boxes, Material for housing, not otherwise specified in this order—except as allowed in Defense Housing Critical List, Mechanical book binding wire, Measuring pumps and dispensers\* for gasoline station, garage and household use, including but not limited to: Gasoline dispensing



pumps; Grease pumps; Oil pumps, except barrel pumps and lubesters; Kerosene pumps; Air pumps, Menu holders, Milk bottle cases, Muirney wire and gimps, Mop wringers, Music stands.

Napkin rings, Necktie racks, Newspaper boxes or holders, Novelties and souvenirs of all kinds.

Office machinery used for\*: Change making; Coin handling; Check cancelling; Check cutting; Check dating; Check numbering; Check signing; Check sorting; Check writing; Envelope handling; Envelope opening; Envelope sealing; Envelope stamping; Envelope mailing; Folding contents of envelope; Ornamental hardware and mouldings, Outdoor fireplace parts.

Packing twine holders, Pall clasps, Paint spray outfits—except industrial, Paper rollers, household, Park and recreational benches, Parking meters, Pencils, automatic, Pen holders, Permanent wave machines, Pet beds, Pet cages, Pet dishes, Phonograph motors, hand wound, Phonograph record blanks, Photographic accessories, Physical reducing machines, Picture and mirror hardware, Pie plates—except commercial or institutional, Pipe cases, Pipe-cleaner knives, Plant and flower supports, Pleasure boats, Pneumatic tube delivery systems—except industrial, Polishing-wax applicators, Polishing-wax sprayers, Portable bath tubs, Posts for fencing—except on A-2 or higher, Poultry incubator cabinets, Push carts, Push plates and kick plates, doors.

Racquet, Radiator enclosures, Radio antennae poles—except on ratings of A-2 or higher, Refrigerator containers and trays, household, Rotary door bells.

Salesmen's display cases and sales kits, Salt and pepper holders, Sample boxes, Scaffolding, Screen frames—except industrial processing, Scrubbing boards, Service food trays, Sewer Pipe, exterior installations—except for vents and within 5 ft. of buildings, Sheet iron or hoop iron packings for cookies and sweet goods, Shirt and stocking dryers, Shoe cleaning kits, Shower receptors—except frames, Shower stalls—except frames, Show window lighting and display equipment, Sign hanger frames, Sign posts, Signets, Silos—except strapping and reinforcing, Sink aprons and legs, Sink metal drainboards, both integral and removable, Sitz baths, Skates, roller and ice, Ski racks, Slide fasteners, Snow shovels and pushers, hand and power propelled—except A-1-j or higher, Spittoons, Sporting and athletic goods, Spray containers, household, Stadiums\*, Stamped bakery equipment, Stamps and tablets, Starter shingle strips, Statues, Steel wool for household use made from other than waste, Store display equipment and show cases, Structural steel home construction, Subway turnstiles\*, Sugar cube dryer trays, Sugar holders, Swivel chairs.

Table name-card holders, Table tops for household use, Tags: Identification; key; name; price, Tanks—(strapping excluded); Dipping—for animals; Watering—for animals; Feeding—for animals; Storage, beer; Storage, water—except: (a) In tropical climates; (b) Heights in excess of 100 ft.; (c) Boilers, hot water and storage; (d) Pneumatic pressure tanks under 31 gallons; Teapots, Telephone bell boxes—except bases and where required for safety, Telephone booths, Telescopes—except U. S. Government Agencies, Terrazzo spacers and decorative strips—except hospital operating rooms, Thermos jugs and bottles over 1 qt., Thermometer bases, household, Tile, steel-back, Tongs, food handling and household use, Tool boxes—except industrial, Tool cases—except industrial, Tool handles—except power driven.

Urinals.  
Voting machines.

Wagon bodies, frames and wheels all metal—except for const., Wardrobe trunks, Wastebaskets, Water color paint boxes, Weather stripping, Wheelbarrows—except wheels, Whiskey service sets, Window display advertising, Window stools, Window ventilators—except industrial and hospitals, Wine coolers, Wine service sets, Wire parcel handles and holders, Wire racks and baskets—except: (a) Industrial; (b) Scientific laboratory equipment; (c) Animal cages for biological work; Work benches—except shipboard and industrial where required for safety.

\*Maintenance and Repair excepted.

#### LIST B—GOVERNING DATE MAY 5, 1942

Access panels, Acoustical ceiling, Air-conditioning systems, Area walls, Ash

sieves, Attic fans, Automobile accessories, Automotive replacement parts non-functional, Awning frames and supports.

Barber and beauty shop furniture, Baskets, Bath tubs, B-B shot for air rifles, Beds—except hospital, Bed spring frames, Beer kegs—except hoop and fittings for wooden kegs, Beer mugs, Bench legs, Binoculars, Bird houses and feeders, Biscuit boxes, Blackboards, Bottle holders, Bread racks, Butter knives.

Cabinets, Cake cutters, Cake tongs, Canopies and supports, Cans or containers for: Anti-freeze, under 5 gal. size; Candy; Chalk; Coffee; Nuts; Pencils; Tobacco products, Cash boxes, Cash registers, Ceilings, Cigarette lighters, Clock cases, Clothes line pulleys, Clothes line reels, Cocktail shakers, Coffee roasting machinery, Cooking stoves, commercial electric, Counter tops, Culverts, Cupboard turns, Cups of all kinds, drinking, Dishwashing machines, Dispensers, hand, for: Paper products; Soap, Door closers, Door handles, Door stops, Drawer Pulls, Dust collecting systems and equipment.

Egg slicers, Electric water coolers, Erasing knives, Escalators.

Feed troughs, Fence posts, Fireplace equipment—except dampers, Flagpoles, Flashlight tubes, Floor and ceiling plates for piping, Floor polishing machines, Flour, salt and pepper shakers, Fountain pens, Furniture.

Garage hoists, car lifts and racks, Grass shears, Grilles, Sewers, Gutters, spouting, conductor pipe, and fittings for single family dwellings.

Hand mirrors, Hat-making machinery, Helmets, Hose reels.

Ice box exteriors, Ice cream freezers, household, Incinerators, Insulation, metal reflecting type.

Jelly molds.  
Kitchenware of stainless steel.  
Lard or vegetable oil tubs, Laundry chutes; Laundry trays, Lavatories, Lawn

sprinklers, Lighting poles and standards, Lockers, Looseleaf binding wire, rings, posts and metal parts.

Mail boxes, Mailing tubes, Measuring pumps and dispensers for gasoline, Station, garage, and household use, incl. but not limited to: Gasoline dispensing pumps; Grease pumps; Oil pumps; Kerosine pumps; Air pumps, Millinery wire and gimps.

Office machinery used for: Change making; Coin handling; Check cancelling; Check cutting; Check dating; Check numbering; Check signing; Check sorting; Check writing; Envelope sealing.

Paint spray outfits, Pencils, automatic, Pen holders, Photographic accessories, Picture and mirror hardware, Pie plates, Pneumatic tube delivery systems, Portable bath tubs, Push carts, Push plates and kick plates, doors.

Radio antennae poles, Refrigerator containers and trays, household.

Salt and pepper holders, Scaffolding, Service food trays, Sewer pipe, exterior installations, Shoe cleaning kits, Shower receptors, Shower stalls, Show window lighting and display equip., Sink aprons and legs, Sink, metal drain boards, both integral and removable, Ski racks, Slide fasteners, Sporting and athletic goods, Stamped bakery equipment, Stamps and tablets, Sugar holders, Swivel chairs.

Tags—Identification; Name, Tanks—storage, water, Teapots, Telephone bell boxes, Telescopes, Thermos jugs and bottles over 1 quart, Tile, steel-back, Tongs, food-handling and household use, Tool boxes, Tool cases.

Urinals.  
Wagon bodies, frames and wheels, all metal, Wastebaskets, Wheelbarrows, Wire racks and baskets, Work benches.

#### LIST C

None.

#### LIST D

Other Scarce Materials  
Metals except gold and silver, rubber.

## Munitions Board Lists Prohibited

## Items for Army, Navy Construction

### WASHINGTON

LIST of prohibited items for construction work for all supply arms and bureaus of the Army and Navy has been made available by the Army and Navy Munitions Board. The list of prohibited items also is being made applicable to all other public and private construction projects by the War Production Board. It includes:

ALUMINUM: Its products of all kinds are prohibited without exception.

ASBESTOS (Amosite): Is prohibited for use in insulation material except where temperatures are in excess of 250° Fahr.

BRASS: See copper.

BRONZE: See copper.

CADMIUM: Its products of all kinds are prohibited without exception.

CHROMIUM: Its products of all kinds are prohibited except chrome pigment for camouflage paint where reflectance to infrared rays is required and where required for painting airport obstacle markings.

COPPER: And its alloys including brass and bronze are prohibited for use in products of all kinds, except as follows:

Bearings and bearing metal alloys.

Condenser tubes, heat exchanger tubes (other than radiators which are used to control air temperature) and tube sheets in oil refining plants; in plants generating steam, and in plants generating electric power.

Conductors of electricity; including motors, transformers, switch gear and similar electrical equipment; this exception shall be applicable only to the

extent necessary to permit the conducting of the electricity required.

Expansion joints, corrugated, high pressure steam lines, (this type of joint is to be eliminated by basic design wherever feasible).

Fire fighting and other protective and alarm equipment where and to the extent copper base alloy is essential to the proper functioning of the parts.

Gas welding and cutting equipment, including cylinder valves, pressure regulators, torches and tips.

Lightning protection for electric power stations, industrial stacks and magazines.

Measuring, recording and control instruments, systems, brass trim in expansion joints, traps, controls and gages, or equipment for use in industrial processes, such as pyrometers, thermometers, flow meters, pressure gages, gas analyzers and their associated control valves, where rust resistance is necessary for proper functioning.

Percussion and electric blasting caps, and necessary accessories, therefor.

Plumbing fixture trim and fittings until ferrous products are available.

Pumps, working parts, such as bearings and shafts.

Safe control devices for use of liquefied petroleum gas, and other gases including pressure regulators, valves and gauges.

Seats, gate rings, and hinge pins of shear and hinge gates.

Valves 2 inches and under, and for stems seats and discs, valves over 2 inches.

Working parts of locks.

The following specific uses of copper and its alloys (including brass and



bronze) as prohibited are set forth:

Blinds, including fixture fittings and trimmings; branding, marking, labeling devices, and stock for same; builders' finish hardware, including push, kick, switch, floor and all other device plates other than as above excepted; conduits and tubing; decorative hardware—including house numbers; door knockers, checks, pulls and stops; doors, door and window frames, sills and parts; elevator and escalators, except bearings; fans; fire fighting apparatus and hydrants (all decorative and all non-functional parts); fire hose, racks, couplings and fittings; furniture hardware.

Gravel stops and snow guards; grilles; gutters, leaders, downspouts, flashings and structural expansion joints; heaters; hooks; inclinator hardware and fittings; kitchen utensils and equipment; ladders and holsts, including fittings; lamp standards, shades, shade holders, and stems; lanterns and lamps; letter boxes and mail chutes; lighting fixtures; lightning protection other than as above excepted; match and pattern plates, matrices and flasks; name, identification, and medal plates; non-operating or decorative parts of installations and mechanical equipment, including frames, bases, standards and supports.

Ornamental metal work; paint; pile butt protection; pipe and fittings; plating primarily for decorative purposes; plumbing and heating supplies—bands on pipe covering, convectors and local heaters; hot water heaters, tanks and coils; pole line hardware; reflectors; rivets and bolts and screws other than as required in above excepted equipment; roofing, flashings, roofing nails and other roofing items.

Screening and screens and screen guards; shelves; shower rods, heads and pans; signs, including street signs; sinks and drainboards; stair treads and threshold; stoves and ranges; termite shields; toilet floats, cistern and low water floats; towel racks; trays; upholsterers supplies, including nails and tacks; valve handles, escutcheon, floor and ceiling plates; valves, bodies over 2-inch size; ventilators and skylights.

Washing machines; waste baskets, hat trees, and similar items; water containers for humidification; water stops; weather stripping and insulation; weathervanes; and all other uses not specifically excepted.

**LEAD:** Its products of all kinds including paint pigments, are prohibited except as follows:

Burning lead for repair of old plumbing installations; cable coverings under severe moisture conditions; caulking on suspended horizontal runs; fuses and fuze plugs; solder; storage batteries.

**MAGNESIUM:** And its products of all kinds are prohibited.

**MERCURY:** And its products of all kinds are prohibited.

**MONEL METAL:** See nickel.

**NICKEL:** And its products of all kinds are prohibited.

**STEEL AND IRON:** Their products are prohibited for use except as follows:

Ash holsts and equipment; bearings; boilers—cast iron; catch basin inlets; coal handling mechanical equipment other than residential; concrete pile casing only where wood cannot be safely used; construction tools and machinery; convectors and local heaters; electric outlet boxes and accessories to the extent that nonmetallic materials cannot be used or are not available; electric panel board and distribution cabinets; electrical equipment; electrical tubing; elevators and escalators; expansion joints and plates in buildings and bridges.

Fans; fencing; fire doors—wood core—sheet metal covered, including jambs and trim; fire escapes; flashings, gutters, downspouts, skylights, ventilators, and louvers not heavier than 26 gage to the extent that nonmetallic materials are not available; garbage cans; gratings; hangar doors—(large doors only) including jambs and trim; hardware, rough and finish; heating to the extent that nonmetallic materials are not available; hose racks, couplings and fittings; hospital equipment; incinerators, irons, and hoppers; kitchen equipment; kitchen utensils; laboratory and research equipment; laundry equipment; letter boxes and mail chutes.

Meters; paint; lighting fixtures; pipe and fittings for plumbing and heating in minimum weights only to the extent that nonmetallic materials are not available; plumbing fixtures (other than those listed as prohibited) and fixture trim; poles in fire stations; pumperette equipment; pumps and motors; radio towers for military use; refrigerators and refrigerating equipment; reinforcing bars and accessories.

Sash weight; screening; sprinkler systems; stoves and ranges; structural steel for construction for spans over 60 feet; tank towers over 50 feet in height; tanks, hotwater storage and generators only; termite shields; thresholds for elevator and fire doors; track rails and accessories; valve bodies and fittings; ventilating systems for blackout buildings, operating rooms and special process spaces; washing machines; water lines and

water supply equipment, and sewerage lines and treatment equipment to the extent that substitute materials are not commercially available.

**TIN:** Its products of all kinds are prohibited except as follows:

Babbitt metal where same is necessary; fuzes and fuze plugs; solder—not over 40 per cent; sprinkler heads. **VANADIUM:** Its products of all kinds are prohibited.

**ZINC:** Its products of all kinds are prohibited except as follows:

Batteries; chain link fencing (wire mesh only)—coating only; electro-galvanizing on electrical tubing; ferrous metal in refrigeration rooms, fermentation rooms, coating only; garbage cans—coating only; hardware (rough and finish) exposed to extremely corrosive conditions—coating only; kitchen equipment—coating only on the following items:

Bain Maries for cold temperatures; cabinets (crushed ice); drinking water fountains and glass storage racks; meat hooks; ice pans; peelers (potato and vegetable); racks (pan, cutlery and trays); racks, (portable); scullery sinks; coffee urns and stands; steamer baskets (vegetable); storage chest lining (bulk ice); table tops for clean and soiled dishes and glasses; tables steam—water pan only; washers (dish and glass).

Pole line hardware—coating only; refrigeration, heating and heat interchange coils—coating only; sheet metal work exposed in permanent construction—coating only.

## New Critical Machine Tools To Be Allocated; 75% to Service Buyers

ALL new critical machine tools have been placed under a limited allocation system by the WPB.

General Preference Order No. E-1-b provides for an apportionment of each producer's monthly deliveries of each size of each type of tool, 75 per cent to service purchasers and 25 per cent to other purchasers. These allocations may be reduced to the extent in each case that purchase orders are not placed for such percentages four months prior to the month of delivery.

The 75 per cent for service purchasers is to be divided among the supply arms and bureaus of the Army and Navy and the Maritime Commission in accordance with a percentage table for each type of tool accompanying the order.

The 25 per cent for other purchasers is to be divided among foreign purchasers and essential industries in this country and Canada.

Tool orders of foreign purchasers are given a blanket A-1-a preference rating and no preference rating certificates are required for such orders hereafter. The orders, however, must be placed through the Army Ordnance Department or through the Procurement Division of the Treasury Department. Purchase orders placed before May 2

must have been scheduled pursuant to a Preference Rating Certificate, Special Allocation Order No. 1 or General Preference Order No. E-3.

Service purchasers, grouped with foreign purchasers in the 25 per cent pool, are defined as those whose purchase orders have been assigned a preference rating, including Canadian.

Any producer of machine tools who has received rated purchase orders for foreign and other purchasers exceeding 25 per cent of his production of any size of any type of tool for any month, is required to report such orders to the WPB for analysis and further directions with respect to deliveries.

The types of tools are divided into two groups. Each producer is required to revise his delivery schedules with respect to tools in Group I on or before June 1. Deadline for tools in Group II is July 1.

A similar 30-day and 60-day period is provided for Group I and for Group II for postponement of revision of delivery schedules with respect to new purchase orders.

Order No. E-1-b substantially alters provisions of E-1-a, revised, but excludes chucks and gauges, which will continue on the latter order.





**FIT... for the job ahead**

**I**n the battle of production, *as on the battlefield*, every Hyatt Roller Bearing is built to give a good account of itself.

Those who make, *and those who use*, the machines of war have welcomed Hyatt ability to stand up, unflinchingly, under high speeds, heavy loads and steady going.

Hyatt is proud of its part in the fight for Victory . . . glad to contribute its fifty years' experience in making better bearings . . . and will be in there serving "for the duration" . . . and thereafter!

Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

**THIS IS THE 50<sup>TH</sup> YEAR OF**

**HYATT ROLLER BEARINGS**



# Mirrors of MOTORDOM

**Go easy on plans to scrap industry's stocks of tools and dies for 1942 models, even though many think car of today will never see assembly lines again . . . War demands pace stirring progress in metallurgy and manufacturing, painting picture of vastly different automobile for tomorrow . . . Quarterly reports show impact of changeover to war work . . .**

**New steel forging plant for Detroit**



By **A. H. ALLEN**  
Detroit Editor, **STEEL**

## DETROIT

STOCKPILE of tools and dies for 1942 automobile models is a glittering nugget upon which industrial salvage officials of the WPB have been casting acquisitive eyes. At a recent meeting here, one of these officials hastily said these dies were going to be scrapped on WPB orders; then later retracted this statement after he became a little more familiar with some of the factors involved.

No one appears to know just how much in point of tonnage these tools and dies amount to, but chances are the actual total would be disappointingly low. Estimates have indicated their cost to have been something like \$60,000,000, but only a fraction of this figure covers the iron and steel in the dies, by far the greater proportion being the engineering and fabricating cost.

Ideal as these tools and dies appear for melting stock, stacked up in neat piles in yards adjoining many auto plants, there would be complications in their utilization as scrap. In the first place many of them are alloy iron, some with nickel, some with molybdenum, some with chromium; many have insert sections of high-speed tool steel or other alloy steel. The classification of the material by alloy type, plus removal of high-alloy steel sections, would be a costly job which, if not done, would mean sacrificing critical alloys to a needless extent.

Furthermore, the junking of this vast storehouse of production tools would put the industry in a bad way should resumption of automobile production be dictated. An early close to the war, even now, would entail a serious delay in "converting" back to automobile production. With tools and dies scrapped, it might be close to a year before any semblance of automobile output could be resumed. Incidental

unemployment, with its usual unrest, would be distressing, to say the least. Hence the precaution of keeping hold of 1942 model tools and dies can be justified for the present.

Opinion is mounting, however, on the score that there will never be any more 1942 models coming from the motor plants of this country. This view is predicated on a long war which every evidence now attests. What the motor car will be when it is over is a lively subject for conjecture. Certainly the engineering and metallurgical "stir" which industries are now being given by the spoon of war is going to advance the concepts of materials and manufacturing technique for

motor cars to a major degree. The pent-up demand for something new, something better, something "hotter" both performancewise and valuewise in transportation should be the stimulus for major achievements.

Let's see what might be done. For one thing the demand for speed in motor cars is likely a thing of the past. Overcrowding of highways and city thoroughfares, with its consequent piling up of traffic fatalities, is going to mean that speed of 60 miles an hour will be just about top. If a person wants to go faster than that, he will have to fly, and

## Hudson Employes Studying for New Jobs



**FORESEEING** the day when large numbers of women will have to be employed on war production, Hudson Motor Car Co., Detroit, has begun an intensive training program under which it hopes to school more than 1000 women formerly employed in automobile plants. The training course will review general shop mathematics, teach women to read blueprints, and to handle and read precision instruments

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he should have plenty of opportunity to fly if the current mushrooming of the airplane industry is to have any permanence, and there are ample signs this is being insured.

Next, suppose we take the present 3500-pound car and trim its weight to a maximum of 1800 to 2000 pounds. Part of this reduction can come from substituting a powerful 3-cylinder engine, carefully balanced for smoothness, in the place of the present six or eight. Part will come from elimination of the present siderail and cross member frame, in favor of making the body itself the structural frame of the car. And for the body, suppose we use stressed-skin aluminum alloy construction, colored by one of the electrochemical processes for treating this metal. Welding, of course, will long have replaced the present tedious riveting process for aluminum assembly, except in spots where it is impossible to apply a welding gun.

### May Use Diesel Engine

Roadability can be assured by keeping a low center of gravity to the car, as well as by insisting that the country's road systems be maintained at the level of the present superhighway. Gear shifts and clutches will be gone, replaced by some variant of the fluid drive. Power braking will be standard. The engine might well be a small diesel, because of its high torque at low speed. And the fuel tank need not

necessarily be filled with oil, since the engine will be found to lose only a small amount of its efficiency when running on gasoline, kerosene, perhaps even soy bean oil.

Cooling systems may well turn away from water in favor of the coolant now used in airplane engines, the system being completely sealed and never requiring attention. Magnesium and aluminum castings and forgings will replace many iron and steel castings and forgings in the engine, as well as in the car structure. Clear, curved plastic sheets may supplant glass in windows and windshields as both a safety and design innovation.

Upholstery fabrics can turn to strange new fibrous materials, both glass and vegetable, so that wool can be diverted to a threadbare populace. New forms of electroplating in color will obsolete the present bright metallic finishes. Synthetic rubbers will insulate and seal the car of the future against the elements. Similar rubbers, perhaps metallized for additional wear in tires, will make the gummy stuff we once received from the Malay peninsula a drug on the market.

New instruments will decorate the dashboard, so that air-minded drivers will feel at home in their automobiles. Altimeters, engine tachometers, temperature and pressure gages for engine oil and tires, wind velocity gages, humidity controls and such are just a few possibilities. There will be no great problem on

cost of such instruments because of the enormous capacity for building them which now has been established to handle airplane requirements.

The cost of this dream car probably will be another surprise to a buying public nearly bent double under the staggering load of taxes. To attract their remaining dollars the automobile will have to be tagged below what it has ever been before. Perhaps \$700 cash, or ten series 1942 \$100 denomination war bonds, will put it in the buyer's garage with a full tank of soy bean oil and including built-in short wave transmitting and receiving equipment permitting the driver to keep in constant touch with his home base.

### Net Income Off Sharply

First-quarter financial statements of two leading automobile companies, General Motors and Chrysler, typify the general effect of suspension of auto production and the gradual changeover to war products. Net income of General Motors slumped off 64 per cent compared with the same three months a year ago, with war materials constituting 60 per cent of the corporation's total outside sales. Chrysler's net was off about 50 per cent from 1941 and about 67 per cent from 1940.

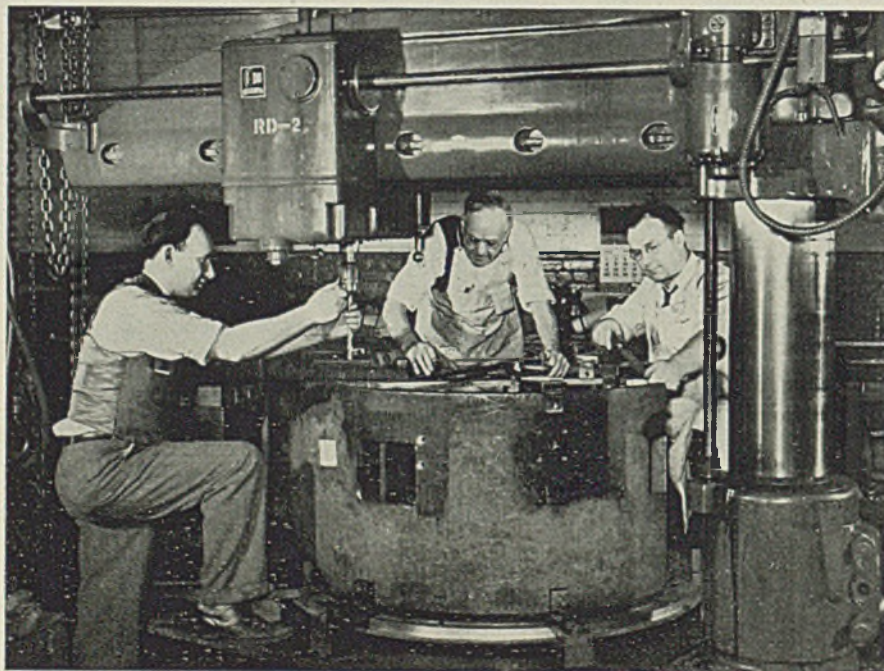
Roughly 90 per cent of General Motors production currently is devoted to war purposes, and following the complete suspension of replacement parts manufacture ten days ago, this figure should increase still further. Suspension of parts manufacture resulted from a WPB order prohibiting General Motors from manufacturing nonfunctional parts for 90 days on account of an alleged technical and minor violation of certain materials orders at the Ternstedt plant.

C. E. Wilson, president, issued these instructions to his plant managers: "On account of the difficulty of interpreting the many and conflicting orders regarding the use of critical materials in the manufacture of service parts for automobiles, trucks, and buses and, due to the fact that the Corporation as a whole is being held responsible for any technical violation by any of the divisions, as shown by an order issued by the WPB against Ternstedt, but applying to the whole corporation, you are hereby instructed to stop the manufacture immediately of all service parts, except those on direct government orders, until this whole matter can be properly clarified and it can be definitely known what items can be manufactured without subjecting the corporation to charges of noncompliance."

By now Mr. Wilson no doubt has read conservation order M-126 ban-

(Please turn to Page 145)

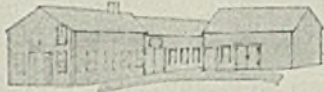
## Jigs, Fixtures Help Body Builders Reach Tank Goals



SHIFTING into high gear on tank production, the converted automotive industry is standardizing each job by use of jigs and fixtures that contributed so much to large-scale output of automobiles. Here Fisher Body craftsmen are building a fixture for a tank turret



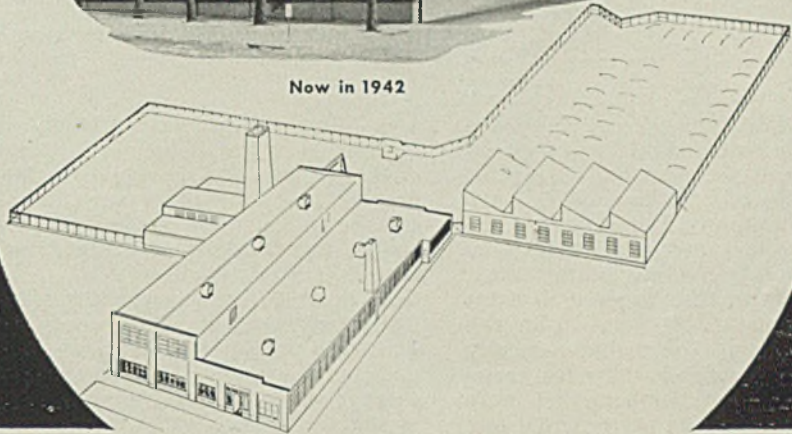
# 25 years of Service



Incorporated 1917



Now in 1942



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 Canada.....Geo. T. White Co.  
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 Chicago.....L. F. Carlton  
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During this time, our customers' (your) business has made it possible for us to serve certain needs of industry.

Maintaining this service has meant that in every few years, additional facilities have had to be incorporated and in more than a few instances, this has called for added floor space. That these additions have been necessary has shown to us that we have a right to be proud of the manner in which we have tried to cooperate.

Invested in our products, the experience that is primarily a result of this service cannot but be of assistance to users of this equipment. Again, the solution of new problems are generally that much closer because of this experience.

We here at T-J want, now more than ever, to continue, and to extend, this service. Offices and Factory at 611 North Mechanic Street, Jackson, Michigan.

## THE TOMKINS-JOHNSON CO.



RIVITORS



CLINCHORS



DIE SINKING  
MILLING CUTTERS



AIR CYLINDERS  
(ALSO VALVES)



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CYLINDERS





# WING TIPS



*Half-million pound flying boat believed likely within few years . . . Glenn L. Martin has 125-ton commercial vessel on drawing boards . . . Medium bomber recognized as more potent air arm than heavier plane . . . Needs no fighter escort . . . Next generation to grant seal of approval on air travel . . . Baltimore overhead conveyor system saves much time in assembling fighting aircraft*

SCRATCH any executive of the large aircraft manufacturing companies and you will find a sort of Buck Rogers who, in hushed whispers, will stoutly maintain that the country's lack of foresight in aviation is losing many a battle today, and who will then proceed to paint a vivid picture of aviation in the years to come. The theme generally is more and bigger ships for cargo carrying; more numbers and more capacity to cut the per ton-mile cost of freight handling to something like a parity with the railroads and steamships.

Glenn L. Martin, president of the Martin company in Baltimore, is a serious and restrained sort of individual who appears only infrequently on the public rostrum. Yet his thinking is and always has been several years ahead of the times. Back in 1914, he said concerning the first World war: "The aeroplane will practically decide the war in Europe. Veritable flying death will smash armies, wreck mammoth battleships,

and bring the whole world to a realization of the awful possibilities of a few men and a few swift aerial demons. For old-time war tactics are no more. The generals who realize this quickest and fight first with flying death, will win."

As he said in a recent address in Detroit, he was just one war too soon with this prophecy. It certainly applies in the present conflict, although there is yet doubt that the viewpoint is shared in high military circles. Consider for a moment the reaction which some of our naval people would display at Mr. Martin's contention that today the multimillion-dollar battleship is "just an auxiliary" to the air force—sort of a mop-up accessory for the bomber fleet.

The flying boat has always been a pet of Glenn Martin. His company built the first trans-oceanic clippers and is now testing a 140,000-pound flying boat which is three times the size of the China Clipper. On the drawing boards in Baltimore is a 250,000-pound commercial air ves-

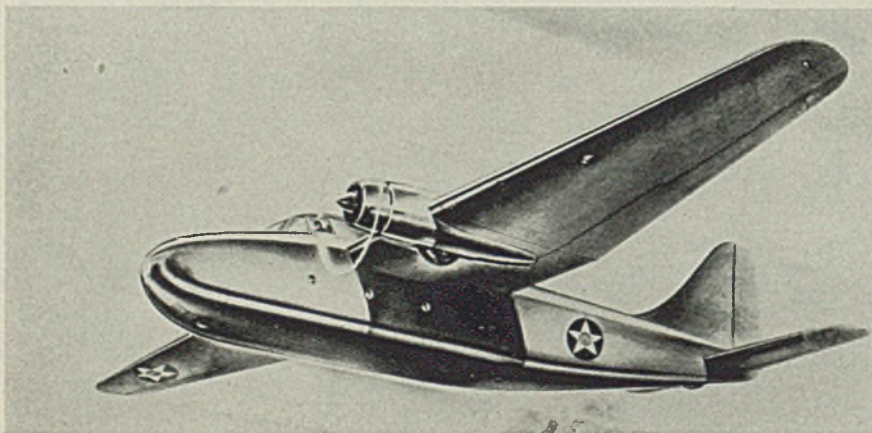
sel, while studies at least have been pushed far enough to justify the conclusion that no technical considerations limit the size of airplanes, the only limit being the amount of payload available per trip. Hence, 500,000-pound ships are believed likely within a few years.

How about this 125-ton ship which is in the offing? Let's take a look at a few figures supplied by Mr. Martin which give an idea of what it is and what it will do. Cruising at about 200 miles per hour, the craft would have a wingspread of 260 feet (the B-19 and the Mars about 210-foot wingspread) and a height of 44 feet. Power would be supplied from four 3000-horsepower engines, any one of which would be capable of keeping the ship in the air. A payload of 50,000 pounds would be carried, equivalent to 100 passengers with 80 pounds of baggage apiece, plus 25,000 pounds of mail, cargo and express—this on an against-the-wind hop such as London to New York. Going the other way, with the wind, payload could be increased to 60,000 pounds, speed increased to 230 miles per hour, making elapsed time between New York and London just 13 hours, or a good "sleeper jump."

Conservative cost analyses have been made over this Atlantic route, showing the per ton-mile rate on the eastbound trip to be 24 cents and on the westbound trip 32 cents, or an average of 28 cents. If the ship is operated at 75 per cent load factor, an operating profit could be realized if a passenger paid \$225 one way, or \$400 roundtrip. This, of course, takes no consideration of amortizing the investment such an air giant would require.

Militariwise, the large flying boat, or the large bomber for that matter, has serious disadvantages, since it requires a fighter plane escort to protect it from attack by hostile pursuit planes. Escort planes have a limited radius, although attempts are being made to extend the radius of fighter planes by installing auxiliary jettison gas tanks below

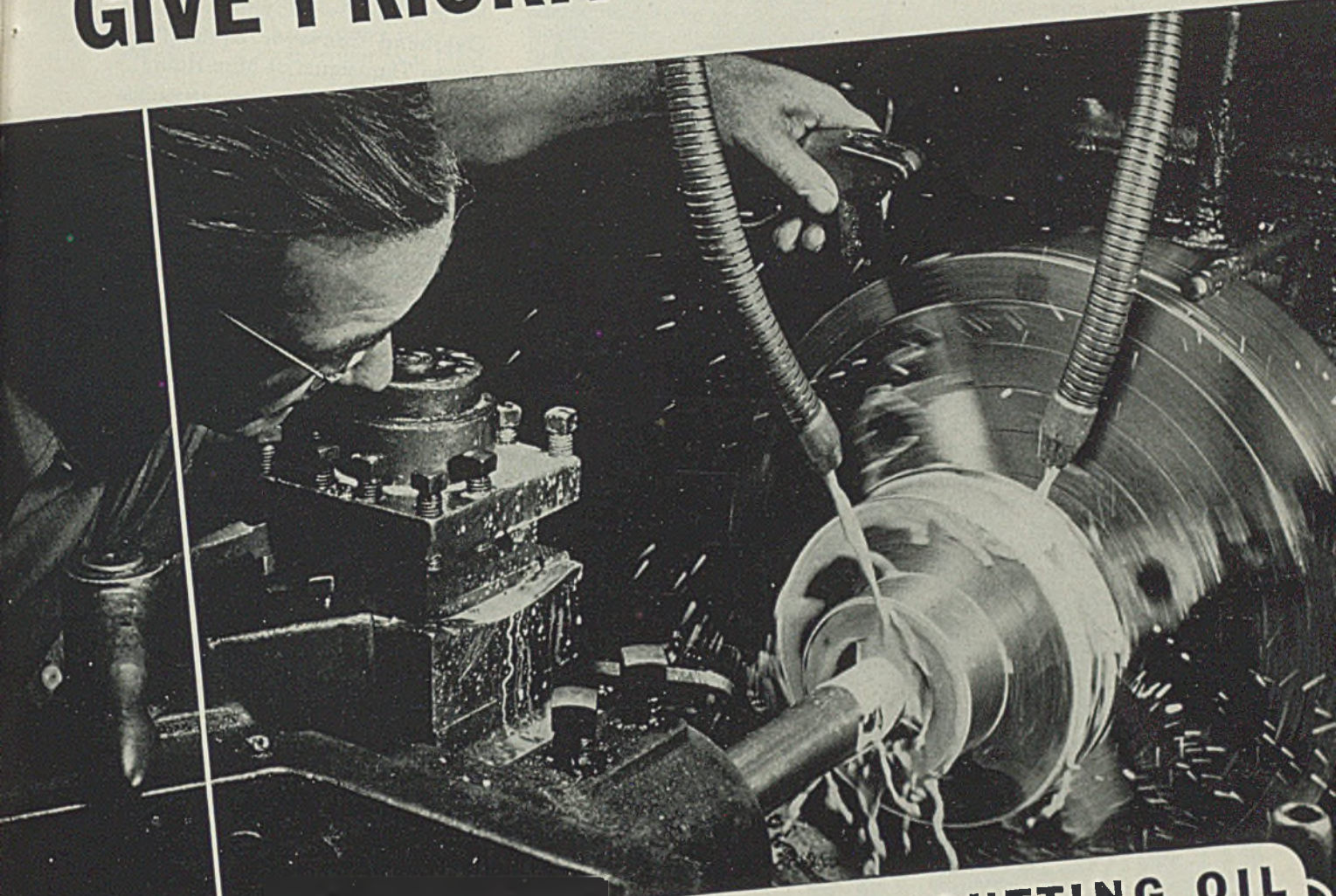
## Military Plane of Wood and Nonstrategic Materials



GIANT military cargo transport plane which Curtiss-Wright Corp. last week announced it will build of "wood and other nonstrategic materials, not on the government's priority list" in a new plant in Kentucky. Designated the Curtiss C-76, the twin-engined plane is reported to be about the size of modern all-metal transport planes operated by domestic airlines. Large numbers will be constructed. No details on specifications or performance have been released by War department



# GIVE PRIORITY TO PRODUCTION



## SUNOCO EMULSIFYING CUTTING OIL *permits increased speeds and feeds... longer tool life*

**PERFORMANCE DATA**  
**OPERATION**—Machining coupling from steel forging @ 98 R.P.M.  
**MACHINE**—2-L Gisholt Turret Lathe.  
**TOLERANCE**—.001".  
**CUTTING LUBRICANT**  
—1 part Sunoco to 15 parts water.

To keep American tanks, planes, guns and shells streaming from assembly lines, machine tools — those master tools for victory — must operate at continuous top speed. Unproductive "set-up" time must be cut to the minimum . . . speeds, feeds and tool life increased . . . extreme accuracy maintained — all to produce more work in less time.

That's the problem Sun Oil Engineers — those "Doctors of Industry" — have solved by

putting Sunoco Emulsifying Cutting Oil to work in plants throughout the nation.

Sun "Doctors of Industry" are ready . . . willing and able to help you increase machine tool productivity in your shop . . . under your own operating conditions. Their services are yours to use in stepping up output. Write or wire



**SUN OIL COMPANY, Phila.**



# SUN PETROLEUM PRODUCTS HELPING INDUSTRY HELP AMERICA



the fuselages. This idea has been used by Japanese planes and is now being tested in this country. Such auxiliary tanks naturally are highly vulnerable and to a certain extent interfere with the aerodynamic efficiency of the plane.

Apparently the medium bomber is coming to be recognized as an even more potent weapon than the heavy bomber or Flying Fortress type of ship. The medium bomber, in the 30,000-40,000-pound class, has virtually the acrobatic performance of a pursuit ship, in fact needs no pursuit escort, the British, for example, using them as night fighters. Three of the most popular types of medium bombers now in production are the

North American B-25, the Martin B-26 and the Douglas A-20 attack bomber.

There is no letup in the number of aviation inventions which are being put to use in the current emergency. They are just kept away from public knowledge, but in the postwar period they will prove to be further stimulus to air travel and air shipping. For example, Mr. Martin in his recent address dropped a hint of one improvement which he claimed now permits flying with full safety through clouds and fog, in other words, with zero ceiling. Such navigational aids logically will be extended to ship operation as well as aircraft.

The key to wholesale acceptance of air travel appears to lie with the oncoming generation. Any new mode of travel fails to meet approval at the hands of its instigators, but usually is brought to full flower by the succeeding generation.

### Overhead Conveyor System Saves Thousands of Man-Hours

Like the rest of the aircraft building industry, Glenn L. Martin's plants have progressed a long way from the barn-like structure he once operated on the eastern outskirts of Cleveland. One of the latest innovations placed in service in his Middle River, Md., bomber plant is an overhead parts materials and finished parts conveyor system which even in its present incompleting stage will save in man-hours the equivalent of one 24-ton patrol bomber.

Similar to the system recently installed at Bell Aircraft in Buffalo, the conveyor is the overhead chain type, carrying an endless procession of flat trays. Starting at raw stores, where incoming materials are loaded, the system delivers them to control stations in the machine shop and other points in detail manufacturing. From these stations, finished parts in baskets or hampers are swung aboard trays and transferred to finishing and plating departments, to be relayed later to finished parts stock. From the latter point, the parts are fed, either upon demand or on schedule, to the battery of hull fixtures or to final assembly lines.

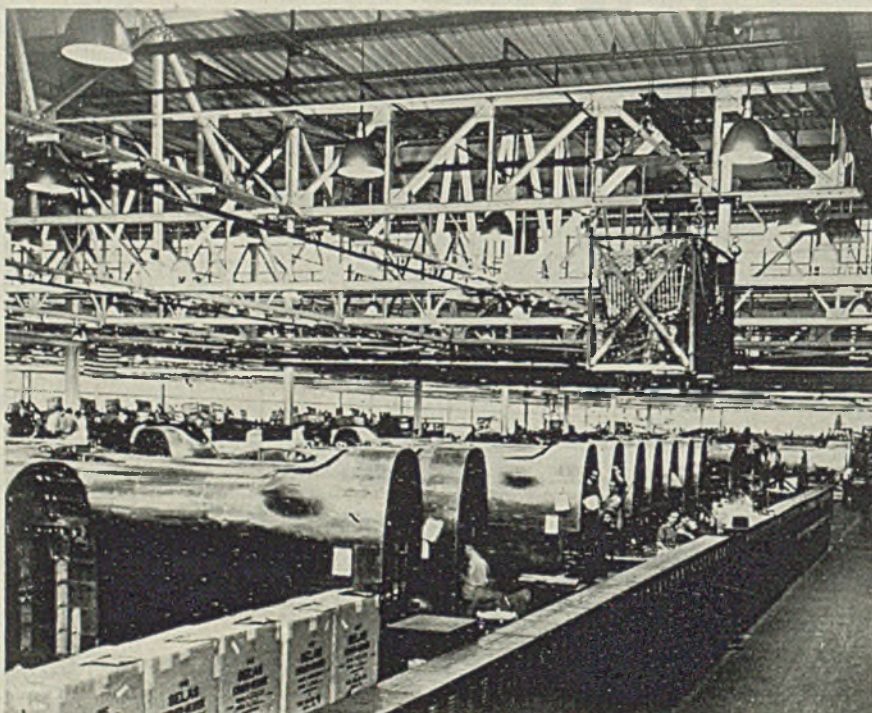
Designers of the conveyor system estimate that 1,500,000 pounds of parts for fabrication move between detail manufacturing centers in a month's time. Stock for these parts leaving raw stores has three times the bulk of steel and carries 40 per cent more weight than the finished parts. At least 50 per cent of this material, now transported by hand and by truck, will be assigned to the continuous overhead monorail system.

Trays are designed to support a load of 200 pounds and sufficient clearance has been provided in the cradle to accommodate a typical load requiring two men to handle. Generally it is expected that consignments will be small wire trays or, at the most, large hampers filled with small parts. Destination of each consignment is identified by



**OVERHEAD** monorail conveyor, above, dips down at this receiving station to permit easy loading of trays with material from stock

**BOMBER** fuselage assembly department, left, which is fed a steady stream of parts by overhead conveyor



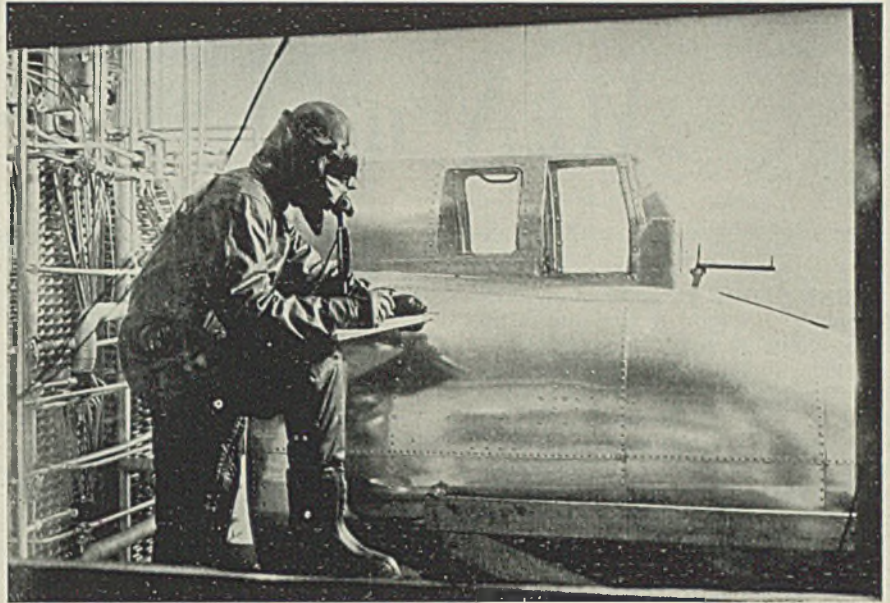


colored card markers. Slow movement of the trays makes it easy to load and unload them.

Typical of delays in aircraft assembly caused by fitting the product to the field of action is the case of the self-sealing fuel tanks which developed leaks when filled with certain types of East Indian fuel. Field reports were rushed back to this country and new specifications drawn up for such tanks going into wings then in production. Delay in getting the revised tank into production naturally caused a delay in assembly of completed wings, necessitating storing of the wings until the tank supplier caught up.

Self-sealing tanks weigh something like 4 ounces per gallon of fuel carried and are made somewhat larger than the space they are to occupy, to insure a tight fit.

The suggestion has been made



### Stratospheric Cold in Boeing's Ground-Floor "Thermos Bottle"

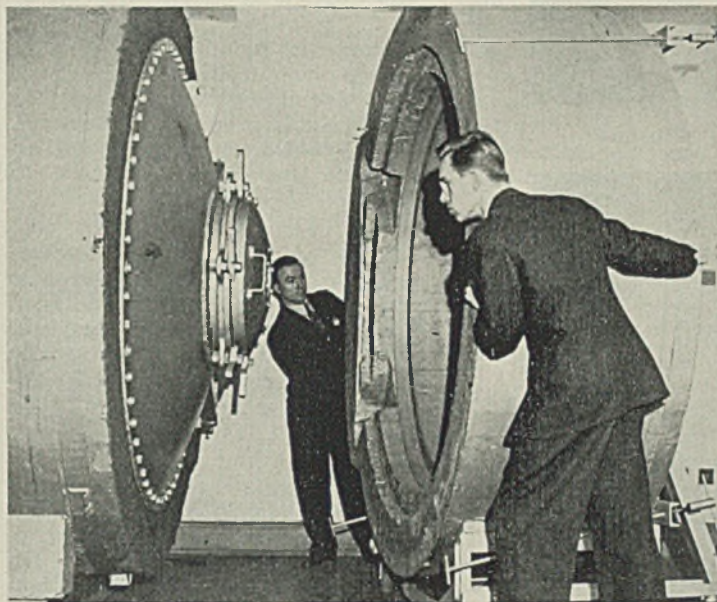
ENGINEER in the new cold room of Boeing Aircraft Co., Seattle, takes notes on certain operations of tail turret under extreme cold. Above view was taken through four layers of glass in the room's only window. Operators wear electrically-heated flying suits to protect them from the arctic temperatures (see WING TIPS, April 27)



LIKE a huge thermos bottle, the low-pressure or stratochamber, left, is capped with this insulation and panel

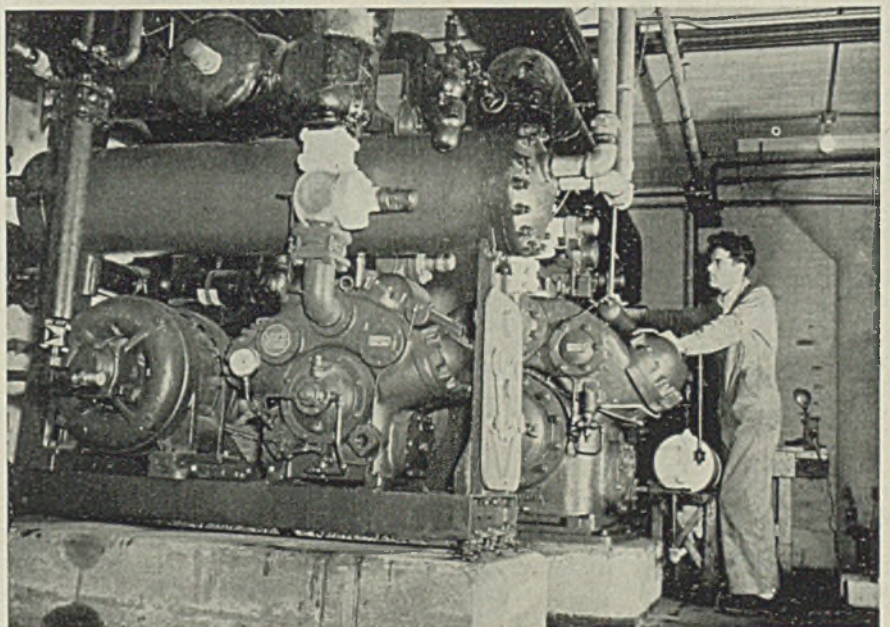


REFRIGERATION equipment, below, with capacity of 108,000 B.t.u. per hour supplies subzero temperature for cold room tests



that this type of collapsible tank might make an excellent emergency fuel supply method for ground or air forces in the field.

It is a surprising fact that in the last several years, the Army has carried more cargo by air than all the air lines combined. Transport of both cargo and troops, and even the use of cargo glider planes towed by "air locomotives" are things which the present war has not yet seen on any large scale but which are believed likely eventualities. This country is now busy building up a fleet of cargo and troop transports, and there have been disturbing rumors heard from Germany that since last summer the *Luftwaffe* has been engaged in assembling a large fleet of these carriers as a possible air armada against the Suez canal, bypassing Turkey and all overland movement.





# MEN of INDUSTRY

**FRED S. DORAN**, associated with Joseph T. Ryerson & Son Inc., Chicago, about 37 years, has been elected vice president. He started as an office boy in the mail room, later entering the sales department. In 1920 he was named assistant sales manager; in 1927 became manager of Ryerson's Cleveland service plant, and last October was transferred to Chicago to assume direction of purchases for all Ryerson plants.



Fred S. Doran

**W. R. Kuhn** has been appointed district manager of Allegheny Ludlum Steel Corp.'s Cleveland office. His entire business association has been with Allegheny Ludlum or its related companies. Starting in the New York office of the former West Leechburg Steel Co. in 1915, he opened a Cleveland office for that company in 1934. He became district sales manager for Allegheny Steel Co. in Cleveland when his former company merged with Allegheny in 1936, and two years later when Allegheny and Ludlum merged he was made assistant district manager at Cleveland.



W. Raymond Kuhn

**W. J. Adamson**, formerly manager of carbon steel sales at Pittsburgh for Allegheny Ludlum, has become manager of the recently enlarged department which combines the electrical and carbon steels with the newly created flat-rolled products department. **H. F. Porter** has been named assistant manager of the electrical materials division, which remains as an integral division within the flat-rolled products group.

**N. H. Brodell**, formerly associated with Timken Steel & Tube Division, Pittsburgh Crucible Steel Corp., and United Alloy Corp., has been appointed metallurgical sales engineer, Copperweld Steel Co., Warren, O.



N. H. Brodell

**Edwin J. Schwanhausser**, vice president since 1939, has been elected a director, Worthington Pump & Machinery Corp. He is in charge of Worthington's Buffalo plant.

**J. R. Snelson** has been appointed acting purchasing agent, Granite City Steel Co., Granite City, Ill., taking over the duties of **J. W. Hargate**, who now is with the scrap section of WPB in Washington. Mr. Snelson has been associated with

Granite City Steel the past 24 years, the greatest part of this period being spent in the cost department.

He has been handling purchasing activities the last year and a half.

**Earl B. Schwulst**, since 1936 first vice president and a trustee of the Bowery Savings Bank, has been appointed a voting trustee of Wickwire Spencer Steel Co., New York.

**Harkness W. Cram**, heretofore sales manager, has been elected vice president in charge of sales, Aircraft Screw Products Co. Inc., Long Island City, N. Y.

**George E. Diamond** has been appointed comptroller, Jessop Steel Co., Washington, Pa. The past ten years he has been cost accountant. **L. G. Vankirk**, since 1938 chief accountant, has been promoted to auditor.

**E. W. Jackson**, general service manager since 1937, Caterpillar Tractor Co., Peoria, Ill., has been appointed assistant to the president. **D. O. Nash**, manager of the service engineering division, succeeds Mr. Jackson as general service manager.

**Alan Kissock**, vice president, Climax Molybdenum Co., who has been in charge of its conversion plant at Langeloth, Pa., has resigned. He has been succeeded by **Arthur Linz**. In addition to management of the Langeloth operations Mr. Linz will continue to direct activities of the company in the chemical field.

**Alfred F. Wieland** has been appointed factory manager of the airport plant, Curtiss-Wright Corp., Buffalo. **A. E. Smith** has been made manager of the Kenmore avenue plant, and **George L. Baum**, production manager, to co-ordinate manufacturing in both plants.

**C. N. Barney**, associated with Worthington Pump & Machinery Corp., Harrison, N. J., about 24 years, since 1931 as treasurer and head of the legal department, has been elected a vice president.

**E. Kuehn**, formerly factory manager, Electro-Motive Division of General Motors Corp., LaGrange, Ill., has been promoted to special representative, assuming contact re-



sponsibilities in the railroad transportation field. **A. J. Heseltine**, chief inspector, has been made factory manager, and **J. H. Hruska** has been advanced to chief inspector. **L. E. Simon** replaces Mr. Hruska as chief metallurgist.

**W. C. Osborne** has become associated with Northrop Aircraft Inc., Hawthorne, Calif., as superintendent of outside production. The past three years Mr. Osborne has headed his own firm of industrial engineers in addition to conducting a school of methods engineering.

**Robert S. Keeler** has been made manager at New York for Delta-Star Electric Co., Chicago, effective May 15. Since 1936 he has been in the company's Chicago office, engaged in sales and engineering work.

**C. Lothrop Ritchie** has been elected a director, Brill Corp., New York, to fill a vacancy. All other directors have been re-elected.

**Louis R. Wallack**, the past three years personnel director, R. M. Hollingshead Co., Camden, N. J., has been placed in charge of industrial relations for Clarke-Harrison Inc., Philadelphia, management engineers.

**Lawrence Y. Spear**, New London, Conn., has been elected president, Electric Boat Co., Groton, Conn., succeeding the late Henry R. Carse. Mr. Spear formerly was vice president in charge of designing, contracting and building.

**W. S. Stephenson**, mill representative in the Philadelphia district for Otis Steel Co., Cleveland, and Michigan Seamless Tube Co., South Lyon, Mich., has moved his offices from 838 to 1142 in the Broad street station building.

**Henry Czech**, manager, northern district, Westinghouse Electric Supply Co., Milwaukee, has been appointed manager of the northwestern district, with headquarters in Chicago. He succeeds **John H. Fisher**, who has been named general manager of the company.

**T. L. Griffin**, works manager and a director, Binks Mfg. Co., Chicago, has been elected vice president in charge of operations. For 18 years previous to his affiliation with the company in July, 1941, he was associated with General Electric Co. in Chicago and New York.

**Gerald Z. Wollam**, formerly assistant manager, radio division, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been



**Frank U. Hayes**

Who has been appointed assistant sales manager, Bullard Co., Bridgeport, Conn., as announced in STEEL, May 4, page 61

named works manager of the new war production plant in Sunbury, Pa.

The following have been elected vice presidents of Westinghouse: **Frank C. Reed**, Jersey City, N. J., president, Westinghouse Electric Elevator Co., a subsidiary; **L. E. Osborne**, manager of steam division, Philadelphia; **Walter C. Evans**, general manager of radio, X-ray and broadcasting divisions, Baltimore; and **Andrew H. Phelps**, Pittsburgh, manager of purchases and traffic. All will continue in their present executive posts.

**J. K. Beeson**, vice president in charge of sales, Pittsburgh Steel Co., Pittsburgh, left May 2 to join the United States air force with the rank of captain.

**Albert H. Graf Jr.**, has been appointed sales engineer in charge of southern territory for Ohio Crankshaft Co., Cleveland, with headquarters at 819 Drewry street Northeast, Atlanta, Ga. Mr. Graf has been located in the main office of the company since 1941, following his return from France where he had served as sales manager of Electric Furnace Co. for many years.

**A. F. Boucher**, district manager at Detroit for Lincoln Electric Co., Cleveland, has been called to active duty as a reserve officer. He will be associated with the Ordnance Department, and will be stationed with the Detroit Ordnance District.

**C. H. Buckmaster** succeeds Mr. Boucher at Detroit, and **J. H. Cunningham**, of the Detroit office, will take over Mr. Buckmaster's duties at Pittsburgh. **George Bain** is being transferred from the Detroit area to the Saginaw, Mich., area.

**Roscoe Seybold**, vice president

and comptroller, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and **Burdette S. Wright**, vice president and general manager, Curtiss-Wright Corp., Buffalo, received the honorary degree of doctor of engineering from Purdue University, West Lafayette, Ind., May 3. At the same time **John H. Collier**, president, Crane Co., Chicago, had the honorary degree of master of industry conferred upon him.

**T. L. Armstrong**, former president, Armstrong Steel & Iron Co., Chicago, later associated with Imperial Brass Mfg. Co., Chicago, and recently manager, Materials Clearing House Committee, has joined E. G. James Co., Chicago, broker of machinery, equipment and supplies. He will specialize in heavy used and new machinery, metals and allied lines.

**Oscar Doyle Johnson** has joined Willard G. Myers Advertising Agency, Philadelphia. He formerly was production head of Philadelphia Electric's advertising department.

**Francis J. Burt**, assistant director of industrial relations, American Steel & Wire Co., Cleveland, has been promoted to director. He succeeds **E. W. Kempton**, who has been transferred to the United States Steel Corp. of Delaware.

**J. H. Devins**, public relations and publicity director, J. Stirling Getchell Inc., Detroit, has been named director of public relations, Bendix Aviation Corp., South Bend, Ind. **H. L. Sharlock** has been named director of advertising.

**Garfield A. Wood**, president, Gar Wood Industries Inc., Detroit, has been elected chairman of the board. **Glen A. Bassett**, vice president and treasurer, has been chosen president. **John J. Bergen** has been named chairman of the executive committee, while **Edward Boehm**, heretofore vice president, has been elected treasurer.

**A. H. Clem**, the past three years sales-service representative, Penn Salt Cleaner Division, Pennsylvania Salt Co., in the Detroit area, has been transferred to the executive offices of the company in Philadelphia, where he will co-ordinate activities of the Industrial Cleaner Division, recently enlarged to handle the metal cleaning problems of war goods manufacturers.

**Blaine G. Wiley**, All-Steel-Equip Co., Aurora, Ill., and **Harold Quinlan**, Spencer W. Curtiss Inc., Indianapolis, have been elected chapter representatives on the board of



directors, National Industrial Advertisers Association, Chicago, to serve until the annual conference in September at Atlantic City. Mr. Wiley replaces **F. I. Lackens**, recently elected NIAA vice president, while Mr. Quinlan replaces **Stanley Murray**.

**Samuel F. Baker** was elected president, Barium Stainless Steel Corp., Canton, O., at the corporation's annual meeting April 29. Other officers elected were: Chairman of the board, **Rudolph Eberstadt**; chairman of the executive and finance committee, **J. A. Sisto**; secretary and assistant treasurer, **A. G. Corbett**; assistant treasurer, **W. W. Randall**; assistant secretary, **Robert C. Hardy**.

## DIED:

**W. R. Pendry**, 67, superintendent, Cleveland coke works, American Steel & Wire Co., in Cleveland, May 2. He had been associated with United States Steel Corp. subsidiaries since 1905.

**J. L. Peters**, 42, owner of J. L. Peters Co., Detroit, structural steel and iron fabricator, in Munising, Mich., May 3.

**Rudolph Brelie**, 57, a partner in the Brelie Mfg. Co., gear manufacturer, Milwaukee, April 30, in that city.

**William Fleming Jr.**, 62, president, National Rivet & Mfg. Co. and Midstate Mfg. Co., Waupun, Wis., in that city, April 28.

**James A. Cranston**, 79, former commercial vice president, General Electric Co., at San Francisco, in that city, April 15.

**William J. Alles**, 69, former assistant factory manager, Dodge Bros. Co., Detroit, April 28, in that city. In recent years he maintained his own sales engineering business.

**William A. Brubaker**, for many years voting representative of Akron Gear & Engineering Co., Akron, O., in the American Gear Manufacturers Association, April 23, in Akron.

**Fred H. Dorner**, 60, May 4, in Milwaukee. Mechanical engineer, he formerly was associated with Allis-Chalmers Mfg. Co. and Bayley Mfg. Co. He was a founder and past president, Engineers' Society of Milwaukee, and former chairman, Wisconsin branch, American Society of Mechanical Engineers.

## Activities of Steel Users and Makers

**B. B. WILLIAMS**, president and chairman of the board, Cooper-Bessemer Corp., Mt. Vernon, O., stated an expansion project at the Grove City, Pa., plant will practically double production of diesel engines. Two new buildings will be constructed under contract authorized by the Bureau of Ships, Navy Department.

**George Whiting Co.**, 1719 North Elston avenue, Chicago, manufacturer of heavy machinery, has sold its plant to the Defense Plant Corp., and will terminate its business. Sale price was \$98,571. The plant will be used by **A. Finkl & Sons Co.**, manufacturer of forgings, for armament production.

**Luminescent Coatings Committee** of the New York Paint and Varnish Production Club last week issued a pamphlet report describing properties and usefulness of luminous paints and coatings for blackouts and other purposes.

To distinguish it from processing divisions, the name **R. & H. Chemicals** department of **E. I. DuPont de Nemours & Co.**, Wilmington, Del., has been changed to **Electrochemicals** department. The manufacturing unit, producing basic chemicals electrolytically, was the **Roessler & Hasslacher Chemical Co.**, when acquired by DuPont in 1930.

"Airgrip" chuck division of **Anker-Holth Mfg. Co.**, Port Huron, Mich., reports shipments of shell holding collets in March were 600 per cent above December. In 60 days output is expected to reach 10 times the December figure.

**Bethlehem Steel Corp.**, Bethlehem, Pa., announced last week that workers in the fire department of the local plant had attained the 100 per cent goal in purchasing war bonds. Figure for the entire plant was 96 per cent.

**Hanson-Van Winkle-Munning Co.**, Matawan, N. J., is building an addition to its electrical department, and an extension to the crane building, to improve storage and loading facilities for electrical and mechanical equipment used in war production installations.

**Aaron E. Carpenter**, president, **E. F. Houghton & Co.**, Philadelphia, announced that effective May 1 the retail sales division of **Lubri-Zol Corp.**, Cleveland, assigned its interests to the Houghton organization

which henceforth will manufacture, sell and service **Lubri-Zol** lubricants.

**Magnus Chemical Co. Inc.**, Garwood, N. J., has organized a Machine Division for manufacture of mechanical metal washing and pickling machines, driers, ovens and burnishing equipment. **Marcel Zinty** is in charge of the division.

## Officers Elected by Warehouse Chapters

Chapters of the American Steel Warehouse Association, Cleveland, have elected officers for the coming year as follows:

**BUFFALO:** President, **W. H. Kline**, **Burke Steel Co.**, Rochester; vice-president, **T. W. Knight**, **Wheelock-Lovejoy & Co.**, and national director, **J. F. Rogers**, **Beals, McCarthy & Rogers, Inc.**, both of Buffalo; secretary-treasurer, **C. C. Kuehne**, **Drennan Hardware Co.**, Syracuse.

**CINCINNATI:** President, **C. E. Mayer**, **Jones & Laughlin Steel Corp.**; vice-president, **A. A. Hupp**, **Central Steel & Wire Co.**; secretary, **J. W. Herr**, **Cincinnati Steel Products Co.**; treasurer, **J. E. Merchant**, **Edgar T. Ward's Sons Co.**, all of Cincinnati; vice-president, **L. E. Dallas**, **Peninsular Steel Co.**, and national director, **J. A. Thiels**, **Miami-Dickerson Steel Co.**, of Dayton.

**CONNECTICUT:** President, **R. B. Shearer**; secretary-treasurer, **C. S. Brouso**, both of **C. S. Mersick & Co.**, New Haven; and **S. H. Hascall**, **Blodgett & Clapp Co.**, Hartford, was elected vice president. **Mr. Shearer** was named national director.

**MISSOURI VALLEY:** President, **Frank J. Daugherty**, **Gate City Iron Works**, Omaha, Neb., and national director, **H. B. Neef**, of same firm; vice-president, **Fred L. Evans**, **Steel Mfg. & Warehouse Co.**, Kansas City, Mo.; secretary-treasurer, **Walter Williams**, **Drake-Williams-Mount Co.**, Omaha.

**NEW YORK:** President, **Charles Kramer**, **Scully Steel Products Co.**, and secretary-treasurer, **Paul O. Grammer**, **Grammer, Dempsey & Hudson, Inc.**, both of Newark; vice-presidents, **Wm. C. Hughes**, **Bright Steel Corp.**, and **H. B. Royer**, **Jones & Laughlin Steel Service, Inc.**, of New York City and **Long Island**, respectively; national director, **H. L. Edgcomb**, **Edgcomb Steel Corp.**, Hillside, N. J.

**NORTHWEST:** President, **L. H. Williams**, **Williams Hardware Co.**, Minneapolis; vice president, **G. L. McKewin**, **Farwell, Osmun, Kirk & Co.**, and secretary **Winter Dean**, **Nicols, Dean & Gregg**, both of St. Paul. **Mr. Williams** was named national director.

**PHILADELPHIA:** President, **Leslie Edgcombe**, **Edgcomb Steel Co.**; secretary-treasurer, **J. M. Mead**, **Joseph T. Ryerson & Son, Inc.**; national director, **Guy P. Bible**, **Horace T. Potts Co.**, all of Philadelphia.

**PITTSBURGH:** President, **J. H. Fogwell**, **Scully Steel Products Co.**; vice president, **J. M. Hilbish**, **Jones & Laughlin Steel Corp.**; treasurer, **F. B. Lorenz**, **Edgar T. Ward's Sons Co.**; national director, **A. W. Herron, Jr.**, **Jones & Laughlin Steel Corp.**, all of Pittsburgh; and secretary, **D. Davia**, **Bethlehem Steel Co.**, Carnegie, Pa.

**SOUTHERN:** President, **Frank Pidgeon**, **Pidgeon-Thomas Iron Co.**, Memphis, Tenn.; vice president, **L. H. Krieger**, **Jones & Laughlin Steel Corp.**, New Orleans, La.; secretary-treasurer, **George W. Smith**, **Southern Steel Co.**, Birmingham, Ala. **Mr. Pidgeon** was named national director.



# Canadian Munitions Output Outruns Schedules; Nonferrous Scrap Licensed

TORONTO, ONT.

CANADIAN production of anti-aircraft and anti-tank guns established a new record in March, according to C. D. Howe, minister of munitions and supply. He stated: "The output in several instances is now months ahead of schedule and substantial revisions of peak estimates have been necessary."

One new plant exceeded by more than 300 per cent its scheduled March output of anti-tank guns. Another plant producing an improved type of anti-aircraft gun is six months ahead of schedule. Output of ammunition plants also has reached a high level. Small arms ammunition is being turned out at the rate of millions of rounds daily. Manufacture of 500-pound bombs passed 100,000 in March.

Four munitions plants have started production on as many types of shells since the beginning of the year, including three calibers of anti-tank and one caliber of tank shells. Shells are being made in 18 for various field artillery guns, naval armament, anti-aircraft, anti-tank and tank guns.

Every six months Canada now produces more explosives than during all World War I, Mr. Howe said. This production comes from some 30 projects owned "by the people of Canada". The plants cost

close to \$125,000,000 and employ a personnel of 45,000, of which one-third are women. They produce 20 or more types of chemicals and a wide range of explosives. During March average production of all explosives and chemical plants was one-fourth better than rated capacity.

Officials of the Toronto Shipbuilding Co. Ltd., a government-owned company, announce an order had been received for 27 folding boats to be carried on troop transports. They will be capable of carrying 35 soldiers. Officials also stated that the company has received orders to build additional submarine chasers.

## Hydroelectric Project Approved

Department of Munitions and Supply, Ottawa, has been given control of all dealings in scrap zinc, copper, tin, brass, aluminum and other non-ferrous metals. The order is designed to insure that all such scrap be used only for war purposes. All nonferrous scrap dealers selling to smelters, foundries or ingot makers must obtain a license. Smelters and ingot makers must also be licensed. A ceiling based on prices received between Sept. 15 and Oct. 11, 1941, has been imposed. Collections by national and civic salvage organizations will not be affected as

such metal will be directed into hands of licensed dealers.

Mitchell F. Hepburn, premier of Ontario, announces that construction will proceed immediately on a new hydroelectric project in Ontario, rivaled only by the huge Queenston-Niagara plant. It will be located on the Ottawa river and is designed to develop 300,000 to 400,000 horsepower and cost \$30,000,000 to \$40,000,000. The premier states that uncertainty as to the St. Lawrence development plan is a factor in deciding on this plant.

Aluminum Co. of Canada Ltd. is reported from Ottawa to be investigating available power resources in Manitoba with a view to establishing a plant in that province, representing an investment of about \$100,000,000. No financial assistance will be required from the government.

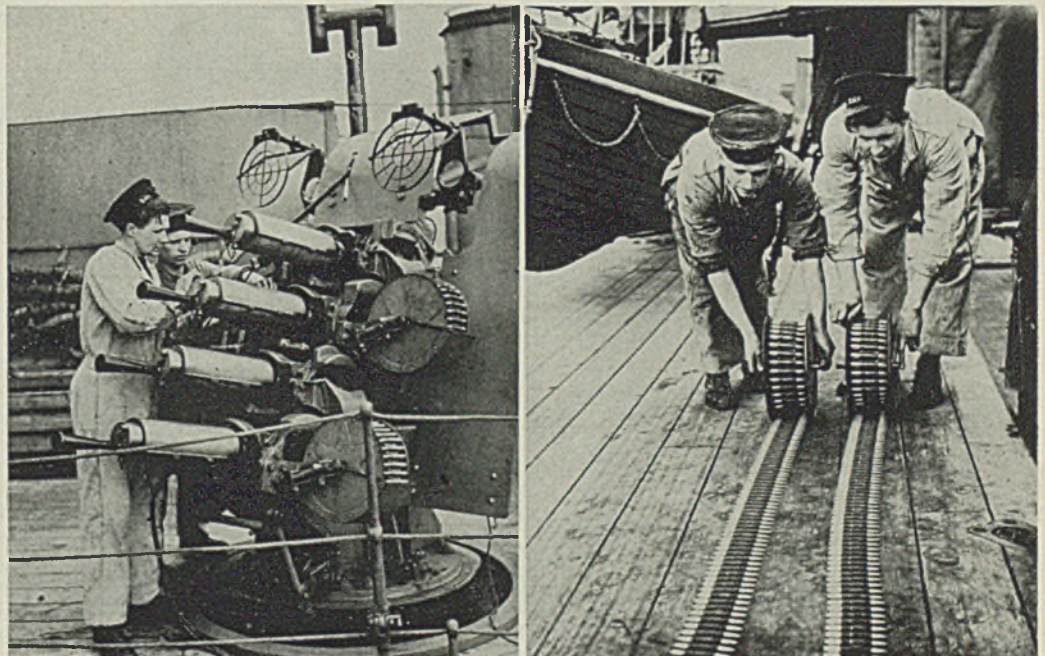
Arrangements are said to be under way for Canada to have representation on the Munitions Assignment Board at Washington, which studies munitions needs of the United Nations and distribution of available supplies.

Canadian production of steel ingots, pig iron and ferroalloys in March and first quarter established new high records. Details are as follows, in net tons:

	Steel ingots castings	Pig iron	Ferro- alloys
March, 1942 . . . .	265,903	167,116	20,261
Feb., 1942 . . . . .	242,921	143,973	17,358
March, 1941 . . . . .	215,009	112,241	17,025
3 mos., 1942 . . . .	807,840	474,245	55,624
3 mos., 1941 . . . .	598,930	325,915	46,093

## Minelayer Crew Prepares Defense Against Aerial Attack

CREW members, left, on a British Navy minelayer tend the multiple anti-aircraft guns which protect the craft from attack by enemy planes. Right, rows of shells are rolled onto a drum ready to be fed to the pom-poms on a moment's notice. NEA photos





# 900 at Mill Supply Convention; Told It Will Be Easier To Replace Stocks

ATLANTIC CITY, N. J.

MILL supply jobbers are likely to play a more important part in the war effort, it was brought out at the triple convention of the American Supply and Machinery Manufacturers' Association, National Supply and Machinery Distributors' Association and the Southern Supply and Machinery Distributors' Association in this city, May 4-6.

Under the Production Requirements Plan, use of which is being extended, distributors were told that it would be easier to replace stocks. Further, the Industrial Supply Branch of the Production Division, War Production Board, is being organized to serve as a "helping hand", according to Franz Stone, who heads the branch. The setup will be similar to that applying to machine tool builders. Mr. Stone said requirements will be figured out in relation to supplies, and followed back to the source of raw material, if necessary.

Problems arising out of the war generated unusual interest in the several sessions held by the three groups, as evidenced by attendance of more than 900. Representatives of war agencies in Washington, and from industry, were featured speakers. There was no questioning the fact that delegates were well aware of the grave responsibilities presented by the war.

The distributor now is generally regarded as an integral part of the war machine, in making fast deliveries of supplies, parts and

equipment to manufacturers, preventing slowdowns in production, and in helping to convert industry to war work. It is generally realized that the manufacturer cannot duplicate the quick service offered by the jobber, especially where the requirement is small and often of an emergency character. Today, 90 to 100 per cent of the business done by jobbers carries preference ratings.

The new "end-use" system being set up under the Production Requirements Plan will alleviate much of the worry on the part of distributors in replacing stocks, according to Charles M. Schoenlaub, of WPB's Production Requirements Branch. The final or end-use of materials will be the determining factor in their distribution.

Mr. Schoenlaub said that all "P" (project) orders are being eliminated and industry generally will be converted to use of "PRP" or the Production Requirements Plan which covers requirements by quarters. About 7000 companies are using PRP and eventually 20,000 to 25,000 will be affected. July 1 has been set as the deadline for a large part of the conversion.

Form PD-25-a, used with PRP, is being simplified, Mr. Schoenlaub said, generally speaking, less information will be required, with the exception of that pertaining to end-use. The latter especially will be required for third-quarter planning. Section C of the form will be eliminated entirely.

Form PD-25-f is designated under

the Plan to provide interim assistance in obtaining materials for unanticipated requirements not covered in quarterly PD-25-a form. PD-25-f also may be used to obtain re-assignment of ratings for entire requirements when it is found that such ratings are not high enough to get needed material. Form PD-25-g covers AA emergency and special requirements.

Mr. Schoenlaub requested (1) early filing of PRP forms, (2) enclosing of an accompanying letter of explanation, (3) keeping requirements in line with anticipated shipments and (4) recognition of existing "M" (material) and "L" (limitation) orders.

Maintenance and Repair Order P-100 also is being revised so that ultimate use, not preference ratings, will be the determining factors.

Distributors are covered by the blanket price control order issued recently, but it is not necessary to post prices as in the case of retailers, according to A. J. Kwitek, chief of the Hardware and Mill Supply Unit, OPA. Distributors must keep records but carbons of invoices are sufficient.

He also said that price controls are essential, as evidenced by the fact that \$13,500,000,000 of the \$31,000,000,000 cost of the last war represented price increases. This war would have cost \$50,000,000,000 additionally by the end of 1943 if price advances had not been checked, he declared.

Problems of the producer in caring for his customers are indicated in the ruling going into effect May 15 preventing further shipments of steel with ratings lower than A-10, Clifford Hood, president, American Steel & Wire Co., Cleveland, said. The production line is the fourth dimension in this war,

## Elected by American Supply and Machinery Manufacturers' Association



H. P. Ladds  
President



A. A. Murfey  
First Vice President



F. J. Tone Jr.  
Second Vice President



W. W. Anderson  
Treasurer



whereas the airplane was the third in the first World War. In previous wars, it was a relatively simple matter to convert industry to the production of war goods, since requirements were insignificant in contrast with the vast amount of mechanized equipment needed today. By the end of the year, Mr. Hood expects we will be producing more than the Axis nations, and will be caught up on reserves. Some form of labor allocation plan will have to be drawn up, he said.

As an indication of the vast amount of steel required for the war program, Mr. Hood pointed out that raw material needs this year would include 100,000,000 tons of iron ore, 43,500,000 tons of scrap, 26,000,000 tons of limestone, 5,500,000 tons of fuel oil and 1,000,000 tons of tar.

In answering the question of how the business man may keep informed, he said, "We have built up in this country the greatest system of news gathering and news dissemination in the world. In this case I am not talking alone of the daily press and the great wire associations. I am also talking about the business press. There is hardly an industry in the country that is not served by at least one good trade publication—a publication edited and compiled by intelligent men, aware of the industry they are covering and its problems and interested in keeping it informed. Now, just because you take a great number of trade publications, don't think you are well-informed. The information doesn't seep through the

cover and into your consciousness by a system of osmosis. It takes time and careful, intelligent reading. It takes study. But the information is there and unless we all devote the time necessary to keep ourselves informed we cannot act intelligently, co-operatively and efficiently."

Howard W. Dunbar, assistant chief, Machine Tool Branch, Production Division, WPB, presented a more encouraging picture of the expanding war machine. The "roar" of industry is beginning to be heard. Aircraft production alone is 50 per cent greater than at the time of Pearl Harbor.

Medium tank production was not started until April, 1941 and heavy tank output until December, 1941, he said, but monthly production already has surpassed the entire total for the last war. In 1941, 40 ships slid off the ways, but this year 850 will be turned out by 65 shipyards with 406 ways.

Machine tool production has been increased from \$22,000,000 in 1932 to a rate of \$1,300,000,000 annually—and the goal for 1942 is \$1,600,000,000. In 1932, the industry employed 25,000 men. Now, 125,000 are on the payrolls.

New officers of the American Supply and Machinery Manufacturers' Association are: President, H. P. Ladds, National Screw & Mfg. Co., Cleveland; first vice president: A. A. Murfey, Cleveland File Co., Cleveland; second vice president, F. J. Tone Jr., Carborundum Co., Niagara Falls, N. Y.; treasurer, W.

W. Anderson, Nicholson File Co., Providence, R. I. Members of the executive committee for the term expiring 1945 are: Frank E. Shurts, American Swiss File & Tool Co., Elizabeth, N. J.; Louis B. Stoner, Jacobs Mfg. Co., Hartford, Conn.

New officers of the National Supply and Machinery Distributors' Association are: President, C. A. Channon, Great Lakes Supply Co., Chicago; vice president, Areas 1 and 2 H. S. Ramsdell, Ramsdell Industrial Supply Co.; vice president Areas 3 and 4, R. E. Kramer, H. Channon Co., Chicago; vice president, Areas 5 and 6, A. J. Glesener, The A. J. Glesener Co., Los Angeles. Several Canadian firms joined this organization the past year.

## Ford Sells Branch Plants For War Production Use

Ford Motor Co. has been disposing of a number of its outlying plants since cessation of automobile production. Its plant at 4100 Forest Park boulevard, St. Louis, has been sold to the United States government, for use not yet announced. The plant was built 20 years ago.

Its Fuhrman boulevard plant, Buffalo, has been leased by D-N-X Engine Corp., wholly-owned subsidiary of Hercules Motors Corp., Canton, O., for manufacture of diesel engines for the Navy.

Defense Plant Corp. has bought a Ford plant in Iowa and leased it to Solar Aircraft Co., San Diego, Calif., Edmund T. Price, president. D. M. Miller will direct its operation.

## Bendix Cuts \$76,354,000 from Uncle Sam's Bill

President Ernest R. Breech of the Bendix Aviation Corp., South Bend, Ind., told the House Naval Affairs Committee that within recent weeks the company has voluntarily reduced prices on government contracts by \$76,354,000. This photo snapped at the committee hearing in Washington, shows, left to right: Charles Marcus, Bendix vice president; Vincent Bendix; Mr. Breech; and Major R. Fleet, former president of Consolidated Aviation Corp. NEA photo.

Renegotiation of war contracts with resultant lowering of prices are proceeding between the armed services, WPB and other contractors. Western Cartridge Co., East Alton, Ill., last week announced it has offered to refund \$1,500,000 of profits made last year from manufacture of Garand semiautomatic rifles.

Forty million dollars was cut from contracts held by Continental Motors for the manufacture of aircraft engines and related items. (STEEL, April 20, p. 58)





# Carnegie-Illinois Training Plan

## Cited as Model by War Board

EMPLOYEE upgrading and training program developed by Carnegie-Illinois Steel Corp., United States Steel Corp. subsidiary, as a part of the company's effort to expand production of war materials is described as a model for other companies in a recent bulletin by the WPB Labor Division.

During the past 18 months the company has added more than 25,000 workers to its payrolls, adding a heavy training burden on the entire organization.

To meet the training requirements, more than 5000 foremen take part in an organized program of supervisory development; approximately 1000 apprentices are enrolled in regular four-year trade courses; 300 college recruits, designated practice apprentices, are assigned to observation and job experience orientation training; several hundred learners and helpers are receiving organized training for production or maintenance positions; 8000 employees are enrolled in evening trade extension classes; and the remaining 135,000 employees are being upgraded by supervisors and instructor foremen or are receiving special job instruction.

Training activities are planned with the intent of measuring the effectiveness of the program in tangible results. Even executive or supervisory training, difficult to evaluate, is appraised critically to assure that it is appropriate and effective.

In most cases the faster or better production must be demonstrated in order to justify the continuation of the training activity.

### Guided By Specialists

Company's programs are instigated and encouraged by a staff of specialists in the field of industrial education and by plant directors of training. Plant programs are organized and expedited under the guidance of the general superintendent and his staff, who determine local training policies, and training working committees composed of representatives of various departments who organize and promote the programs within their various departments.

Various forms of training mediums for the development of executives and supervisors are used, such as conference discussions, panel discussions, lectures, motion pictures, sound slide films, executive letters and similar media.

Apprentices are employed in the following trades: Blacksmiths, boilermakers, bricklayers, carpenters,

electricians, heat treaters, machinists, millwrights, molders, pattern-makers, pipe fitters, roll turners and welders. Related instruction is given in either company or public school classrooms on the basis of 200-hour minimums, during which they are paid at their regular rate.

The company selects each year a large number of college graduates, on the basis of scholarship and personality, from leading universities. The majority of these are given a two-month orientation course during which they study steelmaking practices under the direction of specially trained metallurgists. They then are rotated through a number of positions where job experiences are planned for development purposes. At the end of this period, varying from one to two years, they are assigned to definite positions of responsibility after which they are included in regular supervisory training groups.

Individuals are also selected annually for special training in the accounting, sales, engineering, and industrial engineering departments.

During the past few months, a large portion of the company's

training effort has been directed toward job-training programs for new employes, for employes assigned to units where the processes or equipment have changed, for employes requiring training to prepare them for advancement, or for employes who need upgrading in their present positions.

The company maintains a close relationship with universities, vocational schools and other educational agencies.

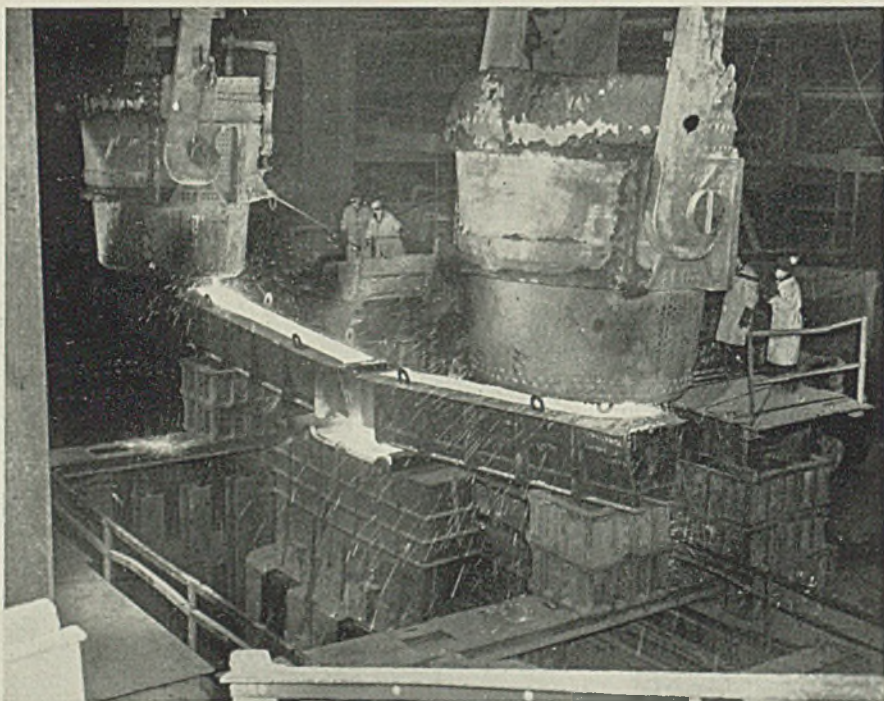
### GE Trains 50,000 for War Production in 18 Months

General Electric Co. has trained more than 50,000 new employes for war work and put them on regular production during the past 18 months, George H. Pfeif, in charge of manufacturing personnel, announced last week.

In addition to its regular apprentice course, now 40 years old, and which requires more than three years to complete, GE is training new workers by three different methods.

One method is to teach a single machine operation on a second shift. A second method is the hiring of employes for a specific shop and training them on the job with an instructor. A third method is to put the new employe to work as an extra man on a machine. The employe is paid while learning.

## 250-Ton Armor Steel Ingot Poured from Two Ladles



OUTPUT of two furnaces—250 tons of steel—is poured into one mold to make a huge ingot for forging into warship armor plate at a United States Steel Corp. plant. Scene is from the corporation's new motion picture, "Steel for Victory", shown for the first time at U. S. Steel's forty-first annual stockholders' meeting May 4





CHAIRMAN Olds listens patiently to one of the many thousands whose incomes depend on their investments. In meeting, "a plaintive voice" asked: "Why is it that stocks go down all the time?" to which the chairman replied the question was "beyond" him

## Stockholders Resolve that Government Should Co-operate with U. S. Steel

OUTLINING a record of accomplishment by United States Steel Corp., Chairman Irving S. Olds, discussed charges recently brought by the War Labor Board against Carnegie-Illinois Steel Corp., its largest subsidiary, at the forty-first annual stockholders meeting in Hoboken, N. J., May 4.

While no specific instances of alleged violations have yet been set forth, he said the charges represent a serious accusation and the stockholders are entitled to know that full compliance with priorities has been and will continue to be the firm policy of the corporation.

"The whole system of priorities and allocations has been a gradual evolution over a period of many months, effective through the issuance by the government of numerous rules, regulations and directives. These various regulations and orders have been revised, amplified and extended from time to time. They have not been entirely free of ambiguity, gaps and contradictions, and a literal compliance therewith was difficult, to say the least.

"Orderly scheduling of a large steel rolling mill is a most complicated affair. The task of those at Washington formulating the priority orders and regulations and of those at the steel mills putting rolling schedules into effect to accord with these orders and regulations was highly involved and difficult."

He added that it would be remark-

able in view of the magnitude of Carnegie-Illinois' operations, if there had not been some instances since May 31, 1941, where strict compliance had not taken place, but "I can assure the stockholders that such instances, if any, have not been 'deliberate' and have been of relatively minor significance in comparison with Carnegie-Illinois vast contribution toward the fulfillment of the government's defense and war production program."

### Shipments Carried Priorities

Mr. Olds said that during last March 99.6 per cent of total shipments of Carnegie-Illinois bore priority ratings. For the present month, he said, 99.1 per cent of the rolling schedule bears a priority rating of A-1-k or better. Plate production increased from approximately 1,360,000 tons in 1940 to about 2,000,000 tons in 1941, and is currently at the annual rate of 3,600,000. Carnegie-Illinois is now and for some time past has been producing a far larger share of the entire country's plate output than its proportion of the nation's steelmaking capacity.

The extent of steel distribution by the corporation for emergency work is best evidenced, the chairman said, by shipments of rolled and finished steel products during 1941 of 20,417,000 net tons, an all-time high and an increase of 36 per cent over shipments in 1940. This represents utilization of finished steel facilities

at the average annual rate of 102½ per cent of total rated capacity. Ingot production last year also established a new all-time high.

Mr. Olds declared taxes of \$191,500,000 in 1941 were the equivalent of \$22 for each outstanding share of common stock. This amount was \$106,000,000 in excess of 1940, an increase of 124 per cent. Still higher taxes are in prospect for the current and succeeding years.

Out of 1941 net income of \$116,171,075, about 52 per cent was paid in dividends on preferred and common stock, while the balance was retained for future needs. Corporation income last year, after income taxes and all charges, except interest on funded debt, amounted to 7.02 per cent of the value of the net assets, compared with 6.99 per cent in 1940. The average return on this basis for the five year period, 1937-1941, was 4.59 per cent against 1.85 per cent for the ten year period, 1932-1941.

At the conclusion of Mr. Olds' report, stockholders gave unanimous support to a resolution declaring that "our government should co-operate to the fullest extent, and if it feels at any time that our company is not co-operating as it should, to first lay the facts before our company's officials, ascertain the facts, and then talk if they must."

This resolution was offered by J. S. Blackman, a stockholder, who complained about government "sniping" at business and asserted that stockholders should "uphold the hands of our officers" in the priorities controversy.

Another resolution declared that "our officers should continue their efforts to represent us stockholders and oppose any further increases in wages, in the light of freezing of income and prices."

Action on these resolutions was confirmed by the chairman to those present and voting in person. Stock held in proxy by the management was not voted.

One stockholder in plaintive voice wanted to know "why is it that stocks go down all the time?" Chairman Olds said the answer was beyond him. About 30 women were



present. One suggested that the only way to get needed corrections in national policy is for each to write to his or her congressman. A man, who gave evidences of being thoroughly discouraged on this point, rose to say he could see "no use in writing to Washington about anything. All they do down there is to do what the administration tells them."

There were questions concerning

taxes, pensions and foreign holdings. Mr. Olds said that 5.7 per cent of the common and 1.5 of the preferred stock was held by those with foreign addresses.

C. T. DeCamp, a veteran at the meetings, rose to a point of order during a rather lengthy discussion by one stockholder to inquire if lunch was ready. It was—exactly two hours after the meeting convened.

general corporate earnings which since 1938 has accompanied the rapid expansion of industrial production extends through most industries, a survey by the National City Bank of New York reveals.

In a study of 280 companies, 60 per cent reported earnings lower than a year ago.

The group as a whole had an aggregate capital and surplus of \$10,790,000,000 at the beginning of the year. Combined net income in the first quarter was \$243,000,000 after taxes. This was 25 per cent below the total for the same companies in 1941 first quarter and 26 per cent below the figure for fourth quarter last year.

## Higher Taxes, Costs Cut Steel's First Quarter Profit 32.8 Per Cent

TWENTY-ONE major steel producers earned an aggregate of 32.8 per cent less in the first quarter of 1942 than in the first quarter last year, and 10.1 per cent less than in the 1941 fourth quarter.

Decrease from fourth quarter earnings is due mainly to larger provisions for federal taxes, while the decrease from the 1941 first quarter was caused both by increased taxes and higher costs, principally for wages. In all periods the industry was operating at practical capacity.

Only three of the 21 companies

reported a gain in the first quarter this year over the comparable 1941 period. Two of these are chiefly alloy steel producers.

Producers with pig iron capacity only showed a loss of nearly 40 per cent from 1941 first quarter profits. Their earnings, however, were higher than in the fourth quarter last year.

Comparisons of first quarter earnings for the past three months and for the last quarter of last year, as compiled by STEEL, are contained in the tabulation below.

Reversal in the upward trend of

## Foundry Equipment Sales Index Doubled in March

Foundry Equipment Manufacturers' Association, Cleveland, reports index of net orders closed on new equipment in March was 1352.7, compared with 636.6 in February and 570.6 in January. This is the highest point the index ever reached.

Total sales index was 1122.3 in March, 567.9 in February and 532.7 in January.

Indexes are percentages of monthly averages of sales to metalworking industries, 1937-39.

### First Quarter Earnings of Leading Producers Compared

	First Quarter 1942	First Quarter 1941	First Quarter 1940	Fourth Quarter 1941
United States Steel Corp. ....	\$27,921,534	\$36,559,995	\$17,113,995	\$20,482,984
Bethlehem Steel Corp. ....	6,140,688	10,436,028	10,891,139	10,459,742
Republic Steel Corp. ....	4,716,962	8,189,967	3,111,723	6,041,245
Jones & Laughlin Steel Corp. ....	2,491,718	4,160,507	1,134,611	4,234,599
National Steel Corp. ....	2,657,837	5,430,389	4,009,193	4,180,078
Youngstown Sheet & Tube Co. ....	2,576,579	4,576,197	1,253,929	3,678,558
Inland Steel Co. ....	2,528,090	3,469,046	3,059,844	3,576,711
American Rolling Mill Co. ....	1,731,635	3,599,241	1,005,194	3,012,715
Wheeling Steel Corp. ....	1,200,090	1,981,009	644,652	1,938,753
Colorado Fuel & Iron Corp. ....	823,273	1,141,756	564,927	806,450
Pittsburgh Steel Co. ....	645,334	889,700	803,202	203,008
Crucible Steel Co. of America. ....	1,951,111	1,489,851	1,193,156	3,164,416
Otis Steel Co. ....	240,015	416,622	165,513*	735,788
Follansbee Steel Corp. ....	165,308	29,930	†240,524*	124,826
Copperweld Steel Co. ....	199,119	331,818	227,687	236,698
Sharon Steel Corp. ....	250,302	527,253	309,576	407,224
Allegheny Ludlum Steel Corp. ....	1,331,426	2,720,164	1,000,297	1,073,473
Granite City Steel Co. ....	77,657	93,195	43,152	276,215
Continental Steel Corp. ....	169,337	313,122	211,456	293,525
Keystone Steel & Wire Co. ....	364,083	410,137	279,385	413,999
Rustless Iron & Steel Corp. ....	671,479	581,698	213,126	622,097
<b>TOTAL</b> .....	<b>\$58,853,577</b>	<b>\$87,347,625</b>	<b>\$46,664,207</b>	<b>\$65,963,104</b>
<b>FINISHING CAPACITY ONLY</b>				
Superior Steel Corp. ....	121,786	228,364	84,009	39,757
Acme Steel Co. ....	639,517	742,053	384,254	762,836
Eastern Rolling Mill Co. ....	190,331	41,877	5,568	166,434
<b>PIG IRON CAPACITY ONLY</b>				
Interlake Iron Corp. ....	444,762	774,855	108,322*	582,464
Sloss Sheffield Steel & Iron Co. ....	277,741	512,359	218,646	127,188
Woodward Iron Co. ....	397,337	551,897	392,076	18,961*

\*Loss. †Period covers 4 months ended April 30.

†Fourth quarter figures based on 9 months and annual reports.



# The BUSINESS TREND

## Index of Activity Advances Slightly



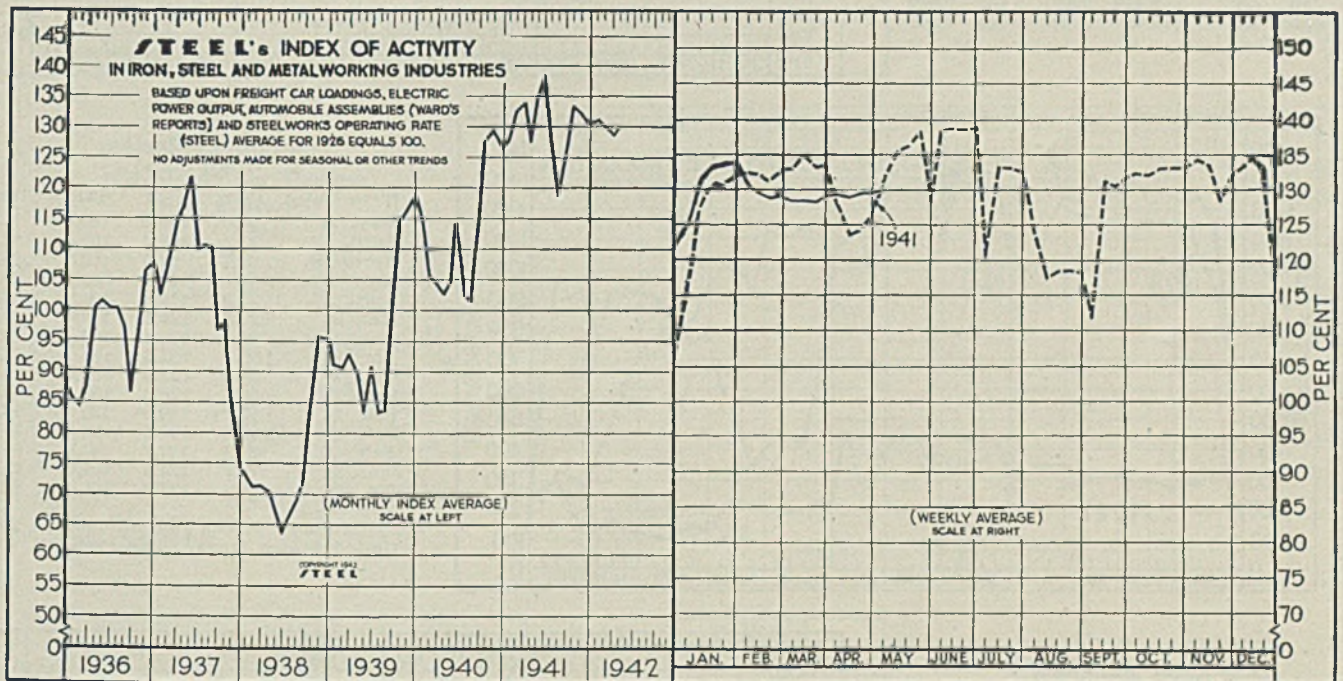
WAR expenditures total about \$3 billion a month and are expected to approach the \$5 billion figure by the close of this year. A substantial proportion of current expenditures is for new factories and machinery to make munitions. Meanwhile, output of armaments is increasing rapidly. It is believed by some observers that the effectiveness of the war effort will depend to a large extent on shipping facilities.

Conservation order M-126, banning the use of iron and steel in the production of 400 civilian products featured the economic news last week. New over-all

price control system, impending tax adjustments and profit limitations are other recent developments.

STEEL'S index of activity recorded a slight gain during the latest period to 130.0. This represents an advance of 0.7 point over the preceding week's index figure of 129.3. A year ago the index stood at 132.6.

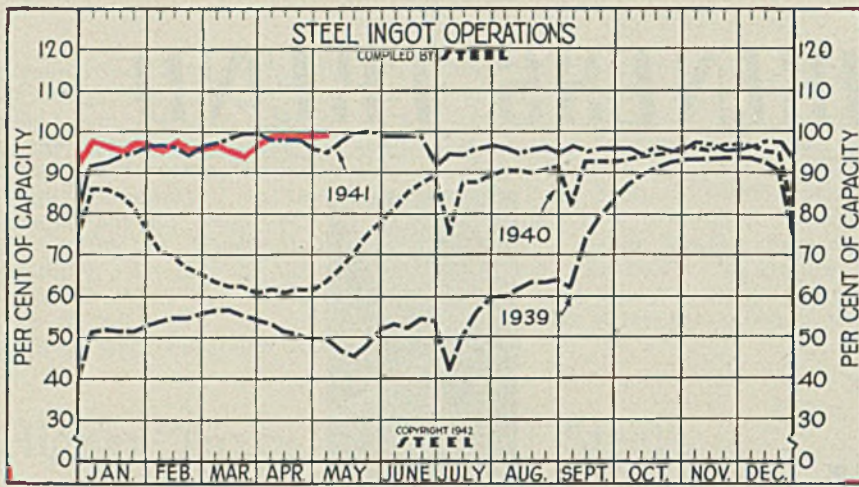
Steel production attained a new all-time record during the week ended May 2, climbing one half point to 99 per cent of capacity. Electric power consumption also edged slightly upward to 3,304,602,000 kilowatts during the latest week.



STEEL'S index of activity advanced 0.7 point to 130.0 in the week ended May 2:

Week Ended	1942	1941	Mo. Data	1942	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931
Feb. 14.....	129.8	132.3	Jan.	131.3	127.3	114.7	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1
Feb. 21.....	129.0	131.2	Feb.	129.6	132.3	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	56.3	75.5
Feb. 28.....	129.1	133.0	March	128.6	133.9	104.1	92.6	71.2	114.4	87.7	83.1	78.9	44.5	54.2	80.4
Mar. 7.....	128.3	133.1	April	129.5	127.2	102.7	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	91.0
Mar. 14.....	128.3	135.0	May	.....	134.8	104.6	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6
Mar. 21.....	128.1	133.5	June	.....	138.7	114.1	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1
Mar. 28.....	129.1	133.9	July	.....	128.7	102.4	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3
April 4.....	129.6	128.9	Aug.	.....	118.1	101.1	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4
April 11.....	129.2	123.8	Sept.	.....	126.4	113.5	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3
April 18.....	129.4	124.2	Oct.	.....	133.1	127.8	114.9	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2
April 25.....	129.3	126.5	Nov.	.....	132.2	129.5	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4
May 2.....	130.0	132.6	Dec.	.....	130.2	126.3	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3





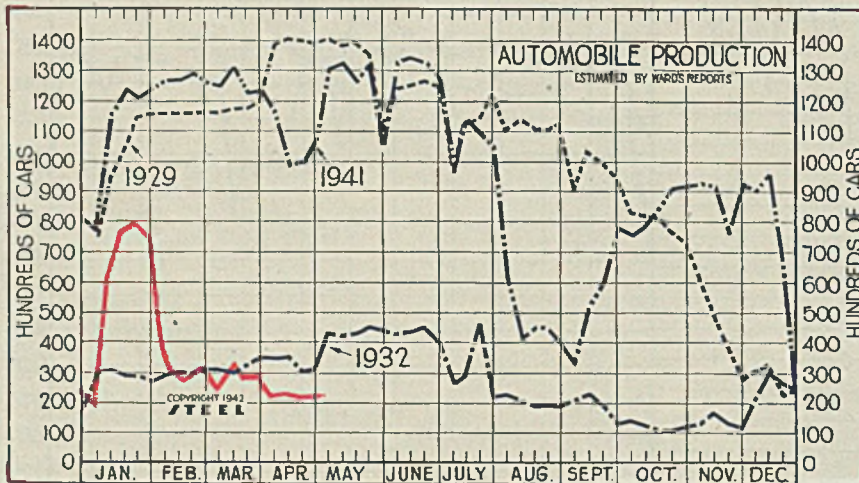
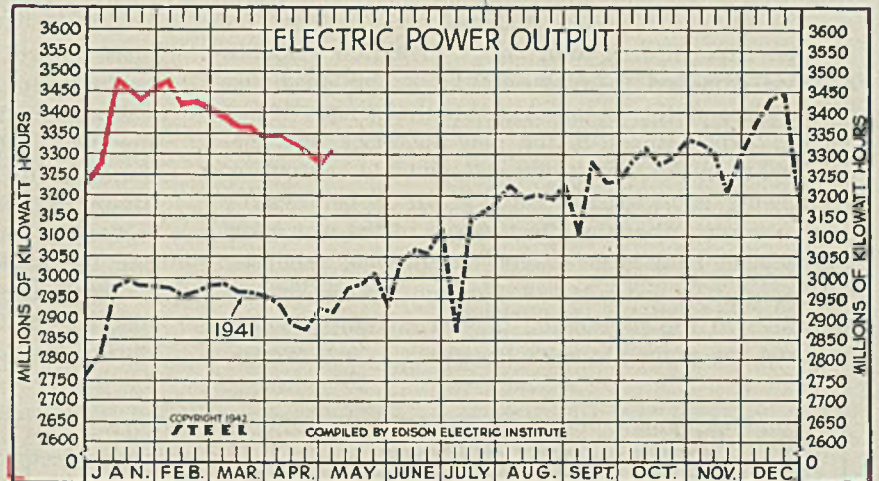
**Steel Ingot Operations**  
(Per Cent)

Week ended	1942	1941	1940	1939
May 2 . . . . .	99.0	95.0	63.5	49.0
April 25 . . . . .	98.5	96.0	61.5	49.0
April 18 . . . . .	98.5	98.0	61.5	50.5
April 11 . . . . .	98.5	98.0	61.0	51.5
April 4 . . . . .	98.0	98.0	61.5	53.5
Mar. 28 . . . . .	97.5	99.5	61.0	54.5
Mar. 21 . . . . .	95.5	99.5	62.5	55.5
Mar. 14 . . . . .	95.5	98.5	62.5	56.5
Mar. 7 . . . . .	96.5	97.5	63.5	56.5
Feb. 28 . . . . .	96.0	96.5	65.5	56.0
Feb. 21 . . . . .	96.0†	94.5	67.0	55.0
Feb. 14 . . . . .	97.0	96.5	69.0	55.0
Feb. 7 . . . . .	96.0	97.0	71.0	54.0
Jan. 31 . . . . .	97.0	97.0	76.5	53.0
Jan. 24 . . . . .	97.0	95.5	81.5	51.5

†Since Feb. 21 rate is based on new capacity figures as of Dec. 31 last.

**Electric Power Output**  
(Million KWHD)

Week ended	1942	1941	1940	1939
May 2 . . . . .	3,305	2,915	2,504	2,225
April 25 . . . . .	3,299	2,926	2,499	2,244
April 18 . . . . .	3,308	2,874	2,529	2,265
April 11 . . . . .	3,321	2,882	2,530	2,235
April 4 . . . . .	3,349	2,938	2,494	2,244
Mar. 28 . . . . .	3,346	2,956	2,524	2,272
Mar. 21 . . . . .	3,357	2,964	2,508	2,258
Mar. 14 . . . . .	3,357	2,965	2,550	2,276
Mar. 7 . . . . .	3,392	2,987	2,553	2,285
Feb. 28 . . . . .	3,410	2,982	2,568	2,294
Feb. 21 . . . . .	3,424	2,968	2,547	2,269
Feb. 14 . . . . .	3,422	2,959	2,565	2,297
Feb. 7 . . . . .	3,475	2,973	2,616	2,315
Jan. 31 . . . . .	2,468	2,978	2,633	2,327
Jan. 24 . . . . .	3,440	2,980	2,661	2,340
Jan. 17 . . . . .	3,450	2,996	2,674	2,342



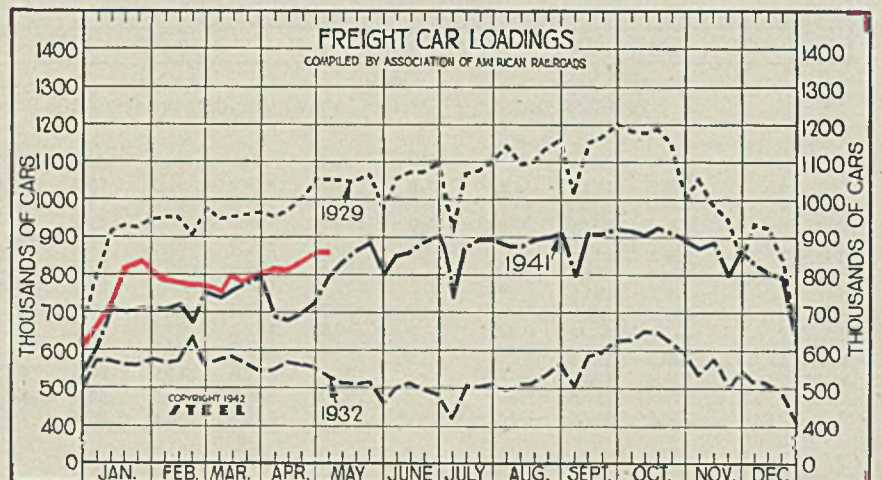
**Auto Production**  
(1000 Units)

Week ended	1942	1941	1940	1939
May 2 . . . . .	22.0	130.6	99.3	71.4
April 25 . . . . .	21.9	108.2	101.4	86.6
April 18 . . . . .	21.7	99.9	103.7	90.3
April 11 . . . . .	23.0	99.3	101.9	88.1
April 4 . . . . .	22.3	116.3	101.7	87.0
Mar. 28 . . . . .	28.9	124.2	103.4	86.0
Mar. 21 . . . . .	28.9	123.8	103.4	89.4
Mar. 14 . . . . .	30.6	131.6	105.7	86.7
Mar. 7 . . . . .	24.5	125.9	103.6	84.1
Feb. 28 . . . . .	30.1	126.6	100.9	78.7
Feb. 21 . . . . .	25.7†	129.2	102.7	75.7
Feb. 14 . . . . .	29.8	127.5	95.1	79.9
Feb. 7 . . . . .	37.1	127.7	96.0	84.5
Jan. 31 . . . . .	73.3	124.4	101.2	79.4
Jan. 24 . . . . .	79.9	121.9	106.4	89.2

†Canadian trucks and automobiles and United States trucks, since Feb. 21.

**Freight Car Loadings**  
(1000 Cars)

Week ended	1942	1941	1940	1939
May 2 . . . . .	859	794	666	573
April 25 . . . . .	855	722	645	586
April 18 . . . . .	847	709	628	559
April 11 . . . . .	814	680	619	548
April 4 . . . . .	829	683	603	535
Mar. 28 . . . . .	805	792	628	604
Mar. 21 . . . . .	797	769	620	605
Mar. 14 . . . . .	799	759	619	595
Mar. 7 . . . . .	771	742	621	592
Feb. 28 . . . . .	781	757	634	599
Feb. 21 . . . . .	775	678	595	561
Feb. 14 . . . . .	783	721	608	580
Feb. 7 . . . . .	784	710	627	580
Jan. 31 . . . . .	816	714	657	577
Jan. 24 . . . . .	818	711	649	594

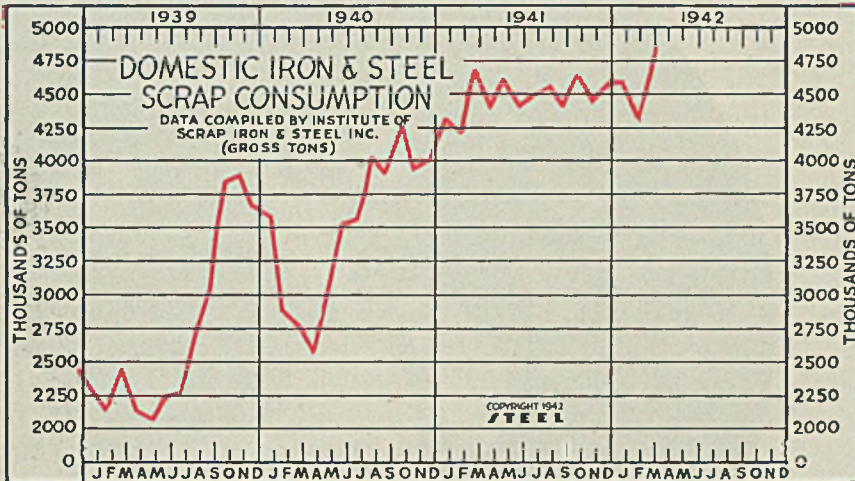
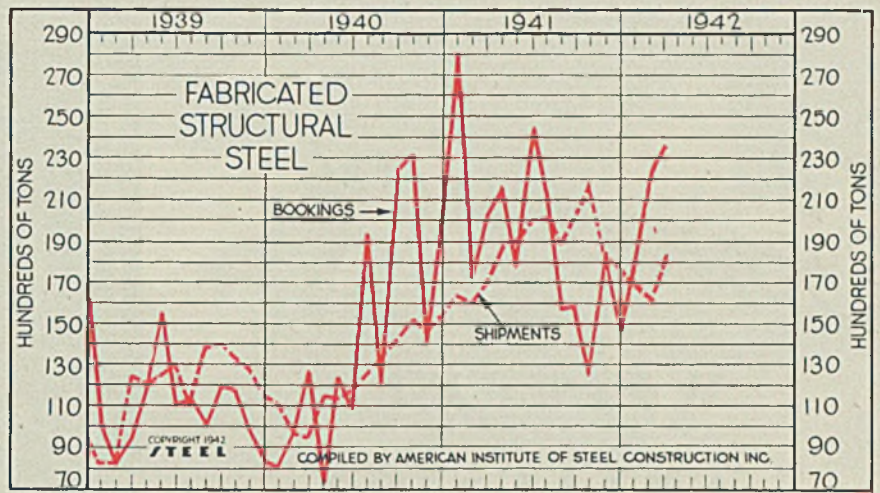




### Fabricated Structural Steel

(1000 tons)

	Shipments			Bookings		
	1942	1941	1940	1942	1941	1940
Jan.	166.2	164.6	110.9	181.8	281.2	81.7
Feb.	162.0	161.4	97.2	227.0	173.6	98.9
Mar.	184.7	170.2	95.9	236.8	206.1	128.3
Apr.	189.8	189.8	116.3	218.0	73.8	
May	191.9	115.6		179.9	126.8	
June	200.5	119.1		246.9	109.7	
July	203.0	127.1		214.8	194.9	
Aug.	189.3	134.9		158.7	122.5	
Sept.	204.1	142.8		158.8	225.5	
Oct.	217.7	153.2		128.7	233.1	
Nov.	182.6	147.0		184.0	141.9	
Dec.	176.1	155.5		146.4	203.1	
Tot.	2251.1	1515.5		2297.0	1748.1	



### Iron and Steel Scrap Consumption

(Gross Tons)

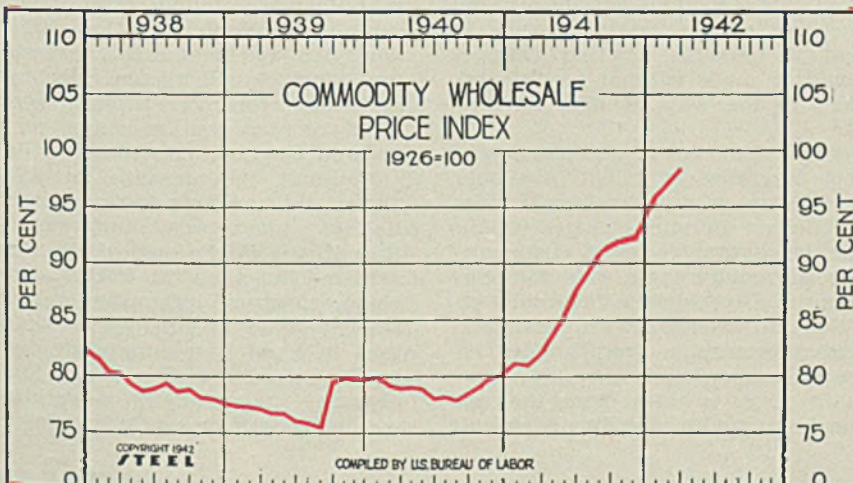
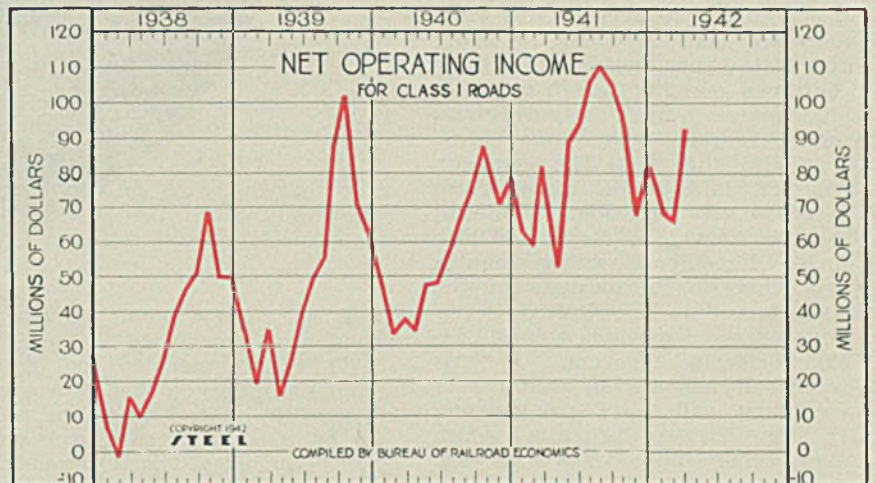
	1942	1941	1940	1939
	(000 omitted)			
Jan.	4,590	4,278	3,581	2,257
Feb.	4,276	4,172	2,812	2,124
Mar.	4,840	4,662	2,728	2,419
Apr.	4,406	2,548	2,114	
May	4,609	3,061	2,079	
June	4,406	3,482	2,221	
July	4,415	3,526	2,247	
Aug.	4,518	3,968	2,675	
Sept.	4,392	3,876	3,018	
Oct.	4,649	4,233	3,809	
Nov.	4,482	3,922	3,858	
Dec.	4,634	3,950	3,613	
Total	53,623	41,687	32,434	
Mo. Av.		3,474	2,703	

### Class I Railroads Net Operating Income

(Unit: \$1,000,000)

	1942	1941	1940	1939
Jan.	\$68.97	\$62.02	\$46.01	\$32.95
Feb.	66.49	58.48	32.86	18.64
Mar.	92.36	80.63	37.03	34.38
April		52.57	34.12	15.32
May		88.63	47.41	25.17
June		93.26	48.09	39.17
July		106.31	57.73	49.00
Aug.		111.32	66.53	54.57
Sept.		104.07	74.72	86.53
Oct.		93.66	87.64	101.72
Nov.		68.76	72.00	70.41
Dec.		80.55	78.79	60.95
Average	\$83.29	\$56.84	\$49.02	

\*Indicates deficit.



### All Commodity Wholesale Price Index U. S. Bureau of Labor (1926 = 100)

	1942	1941	1940	1939	1938
Jan.	96.0	80.8	79.4	76.9	80.9
Feb.	96.7	80.6	78.7	76.9	79.8
March	97.6	81.5	78.4	76.7	79.7
April		83.2	78.6	76.2	78.7
May		84.9	78.4	76.2	78.1
June		87.1	77.5	75.6	78.3
July		88.8	77.7	75.4	78.8
Aug.		90.3	77.4	75.0	78.1
Sept.		91.8	78.0	79.1	78.3
Oct.		92.4	78.7	79.4	77.6
Nov.		92.5	79.6	79.2	77.5
Dec.		93.6	80.0	79.2	77.0
Ave.		87.3	78.5	77.1	78.6



# Conversion

## WITHOUT CONFUSION

BY GUY HUBBARD

Machine Tool Editor, STEEL



ONE OF THE largest manufacturers of business machines in Ohio has swung over to heavy volume variegated war work without as yet requiring greatly increased facilities, either in plant or equipment. This represents a notable achievement in the program of war production—particularly in view of the fact that the regular products of this company are widely used by the Army and Navy, thus necessitating their continued manufacture in considerable volume to meet early deliveries under the priority system.

Despite this fact, the company began to take on the manufacture of heavy volume ordnance material for the Army and Navy and also under Lend-Lease many months ago when the seriousness of the Axis threat to the United States and other democracies first became clearly apparent. In this respect it has set an example of voluntary "all out" participation in the Victory program which many other companies will do well to emulate.

For a company of large size and one manufacturing basically standardized products, it is particularly fortunate in the nature of its equipment, now that conversion is the order of the day. Because of the fact that model changes in its regular line have been rather frequent, use of highly specialized machine tools always has been avoided as far as possible. As a result, the major part of this equipment consists of such dependable general purpose machines as engine lathes, turret lathes, single and multiple spindle automatics, plain and universal milling machines, drill presses and grinding machines as

well as a substantial number of hand screw machines.

While this machine tool equipment essentially is that of a general machine shop, it has been tooled up by experts in such a manner that economical mass production has been achieved. At the same time, this tooling has been kept just as simple and moderate in cost as possible so that changes could be made without costly sacrifices in the way of jigs, fixtures, etc.

With this kind of equipment and tool engineering talent available, and being used to making sudden and often drastic changes in its regular output to meet customers' special requirements, this company was in a peculiarly favorable position to undertake war contracts and subcontracts from others engaged in war work.

To give an idea how the management got into early and highly

effective action on this kind of thing, let us first take a look at some of the important subcontract projects. One of these involves the making of handwheels and precision shafts for a turret lathe manufacturer. In looking over the situation, the business machine manufacturer found that it had the equipment and the skilled workmen to handle this exacting tool work, but both the machines and the workmen already were busy on business machine parts covered by high priorities.

However, the pressure for delivery of the machine tools to essential war plants was much greater than it was in the case of the business machines, so the business machine company promptly subcontracted some of its own work so that it could give immediate help to the machine tool builder. Such prompt, voluntary co-operation within industry not only is going to





Fig. 1—Simple, medium duty drill presses—both singly and in multiple grouping—are used liberally throughout the plant to handle subdivided secondary operations and to keep larger, more powerful “critical” machine tools clear to cope with the more complicated and heavier operations which only they can handle effectively

Fig. 2—Trick tooling and unduly complicated setups on screw machines and automatics are avoided. Therefore off-center drilling, cross drilling, burring, cross milling, tapping, etc., are done as secondary operations on drill presses, tapping machines and hand milling machines. In many cases the work is transferred progressively from spindle to spindle along the line. Interposed between these multiple spindle drilling machines are experienced inspectors equipped with whatever gages are necessary to subject each piece to quick but thorough checkup. Those found defective are simply handed back to the machine operators responsible for them. They in turn salvage them by remachining, if possible, and take care that errors are not repeated on subsequent parts

Fig. 3—Wide application of medium duty, bench-type drill presses on cross drilling, spotting, counterboring and similar operations ties in well with use of girls on these repetitive operations. Simple jigs and fixtures expedite this work and care is taken to make conditions as quiet and as comfortable as possible in the departments where girls are employed

Fig. 4—Inspection benches are located as closely as possible to sources of high speed, repetitive work such as hand screw machines and automatics. This is in order that deviations from specifications will be detected and eliminated before large numbers of defective parts are run off. Girl inspectors become amazingly proficient in keeping pace with production—frequently checking one piece out of every ten which drop off the machines

Fig. 5—On an assembly job which involves both physical strength and manual dexterity, the flow of work is speeded up by having men handle the heavier operations while girls take care of those which require delicacy of touch and nimbleness of fingers

have a tremendous effect toward winning the war but also it will be of great economic importance by spreading war work rapidly over the entire metalworking field instead of congesting it in certain spots.

Another subcontract involves precision machining of bodies and other permanent mold cast parts of aerial cameras. This subcontract was taken because these parts are quite similar to parts of the business machines, and because the baked finish of the parts can be handled with the same cleaning and enameling equipment used for the regular product.

After the initial subcontract had been tooled up and gotten successfully under way, it became apparent that many other parts of the camera could be handled with equal facility with the addition of a mini-

mum amount of new equipment such as low cost drill presses (see Fig. 1) and hand milling machines. It looks now as though subsequent subcontracts will involve manufacture and assembly of practically complete cameras. This is a good example of how experience builds up rapidly on this kind of work.

Shell and fuse contracts represent the largest volume of war work undertaken by this company and cover a wide range of sizes and kinds. This work involves the use of large batteries of automatics—both single and multiple spindle—the parts ranging from tiny pins to large diameter pieces weighing several pounds.

While it is possible on modern automatics, of which this company has a large number, to do extraordinary things in the way of com-

pleting intricate parts before cutting them off, this is apt to involve complicated, “tricky” tooling. On the basis of shell and fuze manufacturing experience dating back to the first world war, this company avoids that kind of thing. The general rule is: “Keep the automatic tooling plain and simple—handle tricky operations as secondary operations.” See Fig. 2.

As a result, liberal use is made of low cost medium duty drill presses—both single and multiple head types—for cross drilling, off-center drilling, burring and various other secondary operations on the screw machine parts. Liberal use also is made of hand and plain milling machines where cross milling, slotting, etc., are involved.

These second operation machines to a large extent are operated by girls, as shown by Fig. 3. Within a short time they become extremely proficient in doing this work with the help of small jigs and fixtures of simple design which can be passed along the line from one operator to another. Although the work generally is not difficult, it has been found desirable to use girls who show relatively high mental and physical alertness. As a matter of fact this is the general policy throughout the entire plant.

Inspection also involves employment of a large number of girls. The system itself is worthy of mention because of the fact that at a time when waste of time and materials must not be tolerated, this system prevents such waste by choking it off right at its source.

The basic idea of the system is to get inspection just as close to production as possible so as to go over the work when it literally is “hot off the machine”, as is the case in Figs. 2 and 4. For example, there is an inspection table close by a high speed multiple spindle automatic and at this table there are enough girls to give a quick but thorough “going over” to—let us say—one piece out of

(Please turn to Page 115)



# Making Ship "Pushers"

By E. K. HENLEY  
Federal & Marine Department  
General Electric Co.

ONE OF the best ways to get a clear picture of the operation of the propulsion equipment that "pushes" our big ships is to see how it is made and tested before it is installed in a hull. Ship propulsion sets of both the geared-turbine and the turbine-electric types are produced at General Electric for all types of merchant ships. Three shifts a day are accelerating production to match that of our shipyards now turning out a rapidly increasing armada of shipping to speed the flow of supplies to our fighting forces all over the globe.

With a shipbuilding program aimed at producing two ships for every one sunk by subs, the accompanying illustrations show an important phase of production that is helping make that program a reality today.

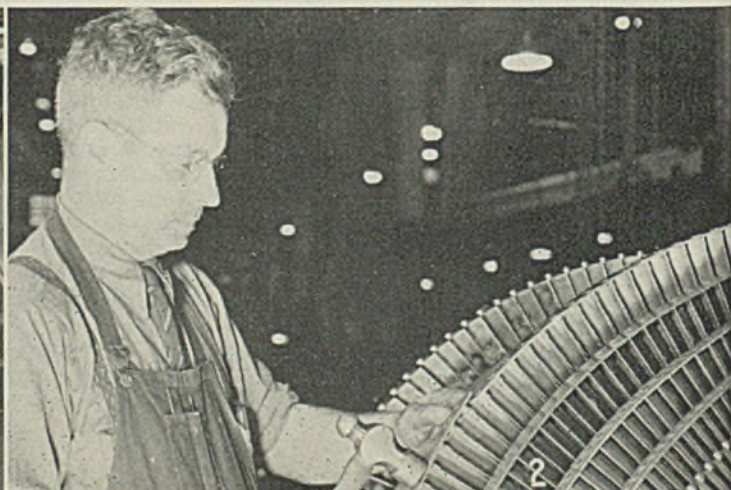
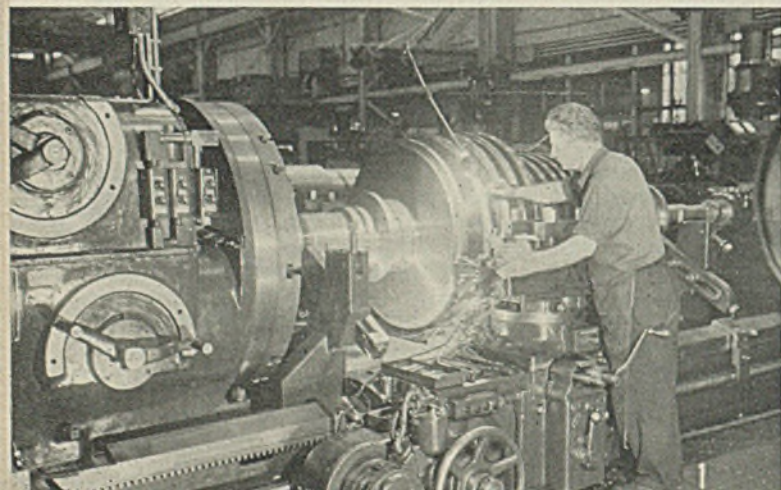


Fig. 1—Steam turbines, one of the most efficient prime movers known, form the heart of the propulsion equipment on most ships. They are precision-made machines that require the ultimate in perfection from the material of which they are made and in every operation involved in their manufacture. Here a workman measures the dovetail dimensions of a turbine rotor that is being machined in a special precision lathe

Fig. 2—Rows of buckets like these, dovetailed to the rotor forging, form the moving element inside the turbine. To

withstand the terrific punishment involved in harnessing the energy of high-pressure high-temperature steam, the buckets must be forged or milled from specially alloyed steel. This workman is hand-riveting shroud band sections to the bucket wheels

Fig. 3—This turbine is direct-connected to an electric generator that will produce the power for propulsion motors on an all-electric drive for a ship. Here it is being prepared for a performance test prior to shipment. Top half of stator casing is yet to be put in place





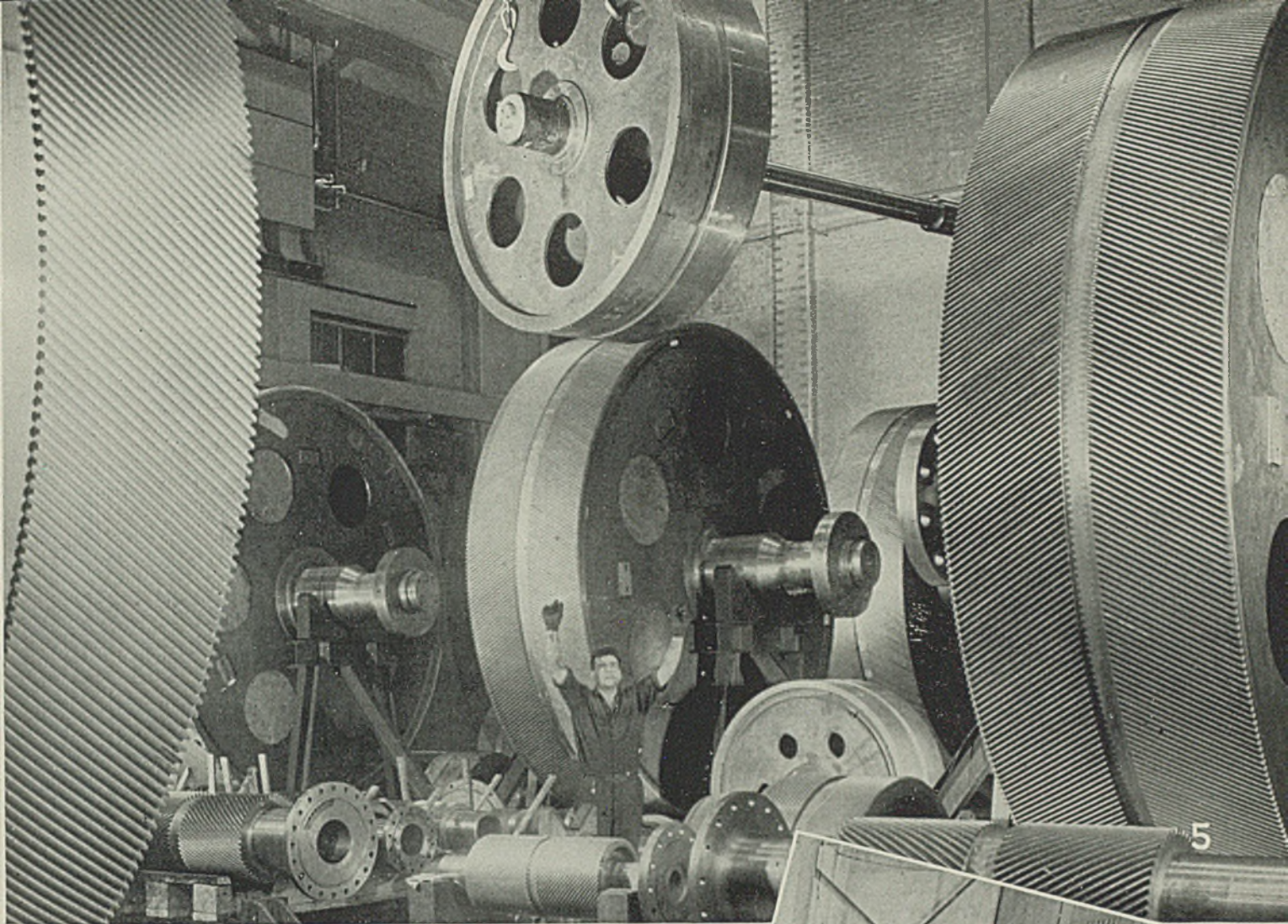
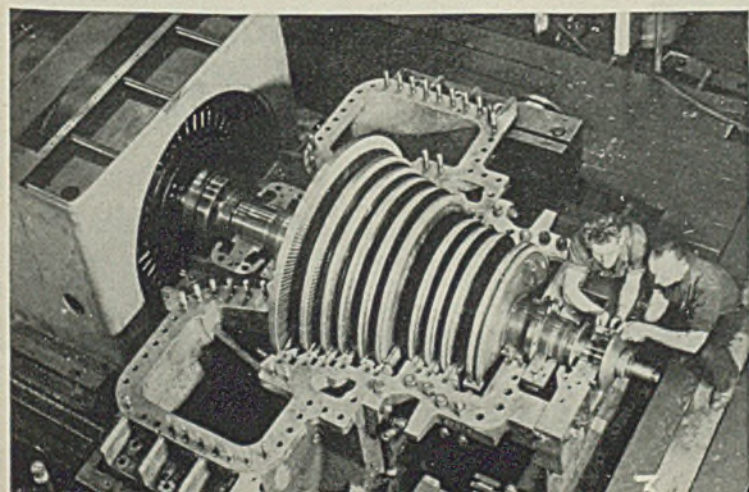
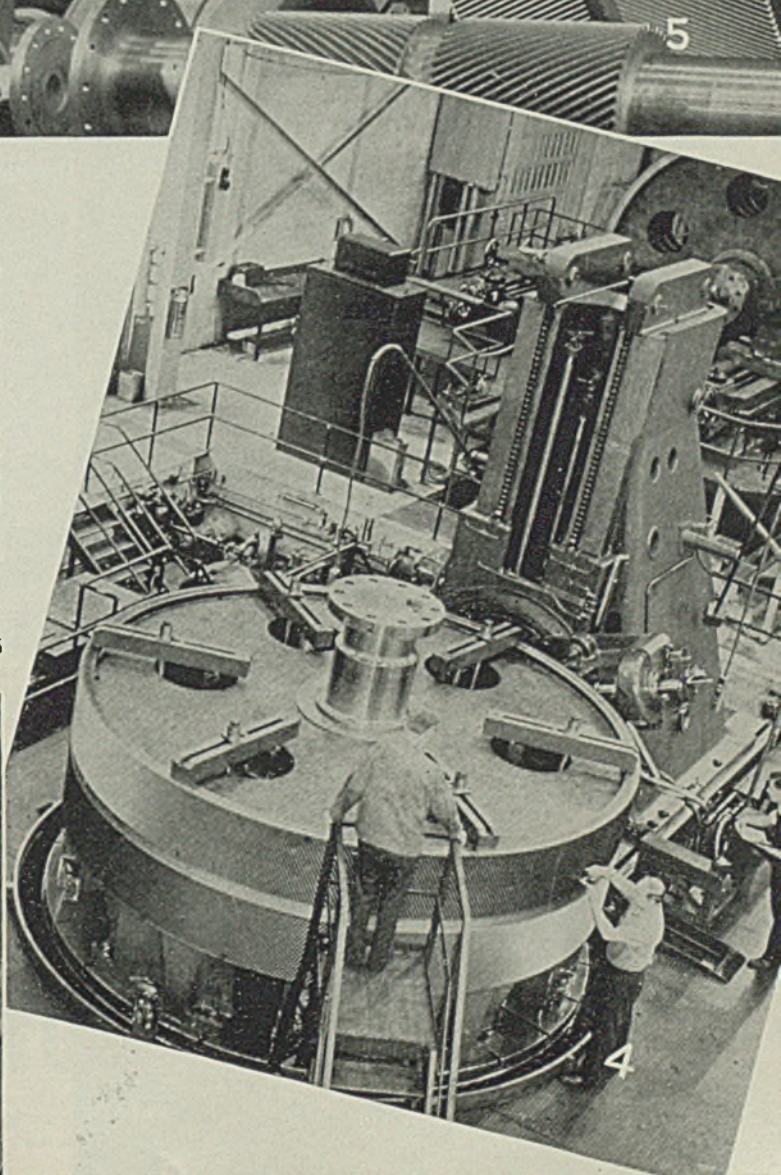


Fig. 4—Large hobbing machines like this one cut teeth in bull gears up to 35 tons and 200-inch diameter to a tolerance of 0.0003-inch. Rough and finish cutting these gears requires 285 hours. Finish cuts must be made without interruption, so an auxiliary power supply as well as a duplicate lubricating system is always ready

Fig. 5—A few of the different types of gears and pinions used to change the high speed of the turbine into slower speeds for the propellers. Workman is directing overhead crane removal of high-speed gear blank to a hobbing machine. Large gears shown are low speed or "bull" gears





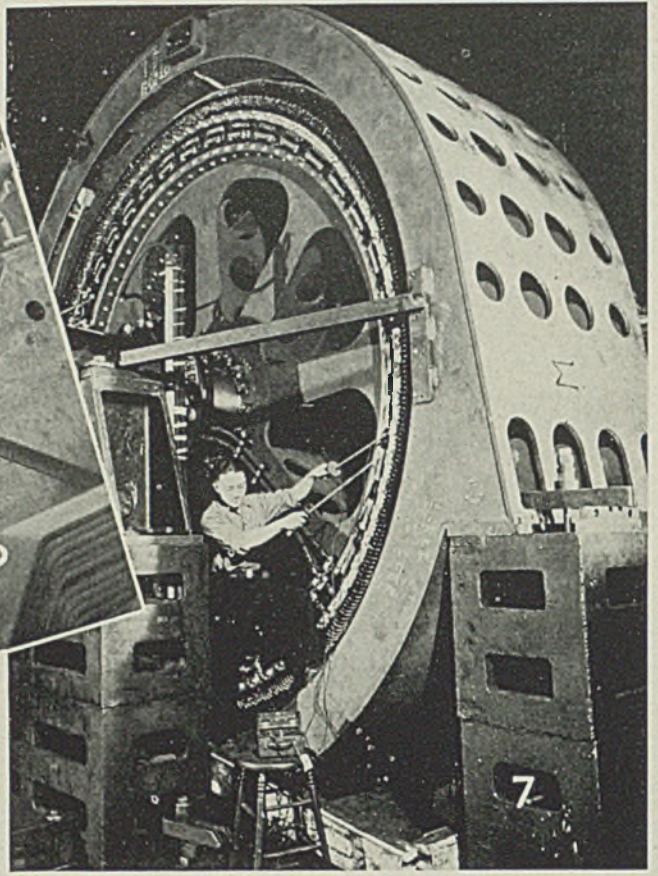
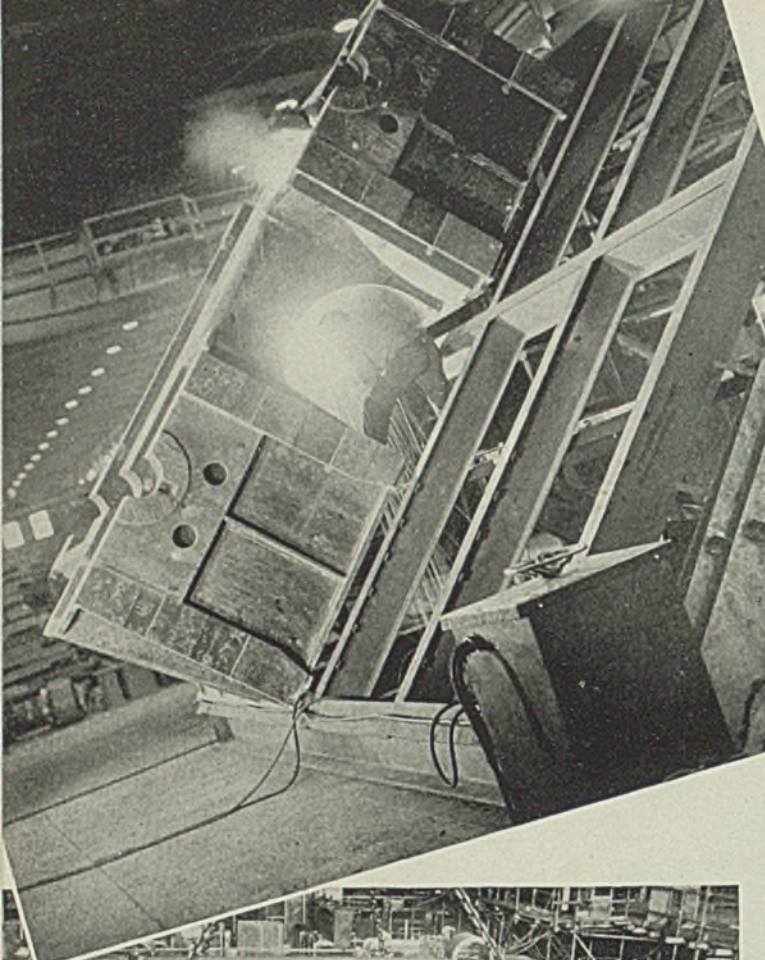


Fig. 6—Special tilting work fixtures allow gear casings to be positioned for best results in welding. Previously made of heavy cast iron or steel, fabricating them from steel plate and castings has reduced their weight from 60 to only 35 tons, an especially important saving on machinery for ships



Fig. 7—Chinese engineer, Francis Li, helps test a 6000-horsepower propulsion motor for an electric-drive ship that may carry supplies to his countrymen. Born in Hong Kong, 23-year-old Li came to the United States in 1937, completed his electrical engineering course at Manhattan college in 1941, now is student engineer with General Electric. This view shows him measuring voltage drop across each pole to check against snorted turns in windings

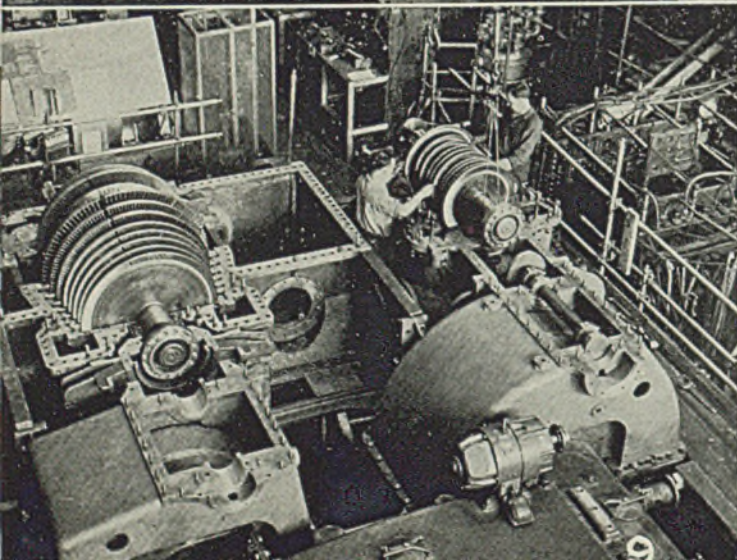
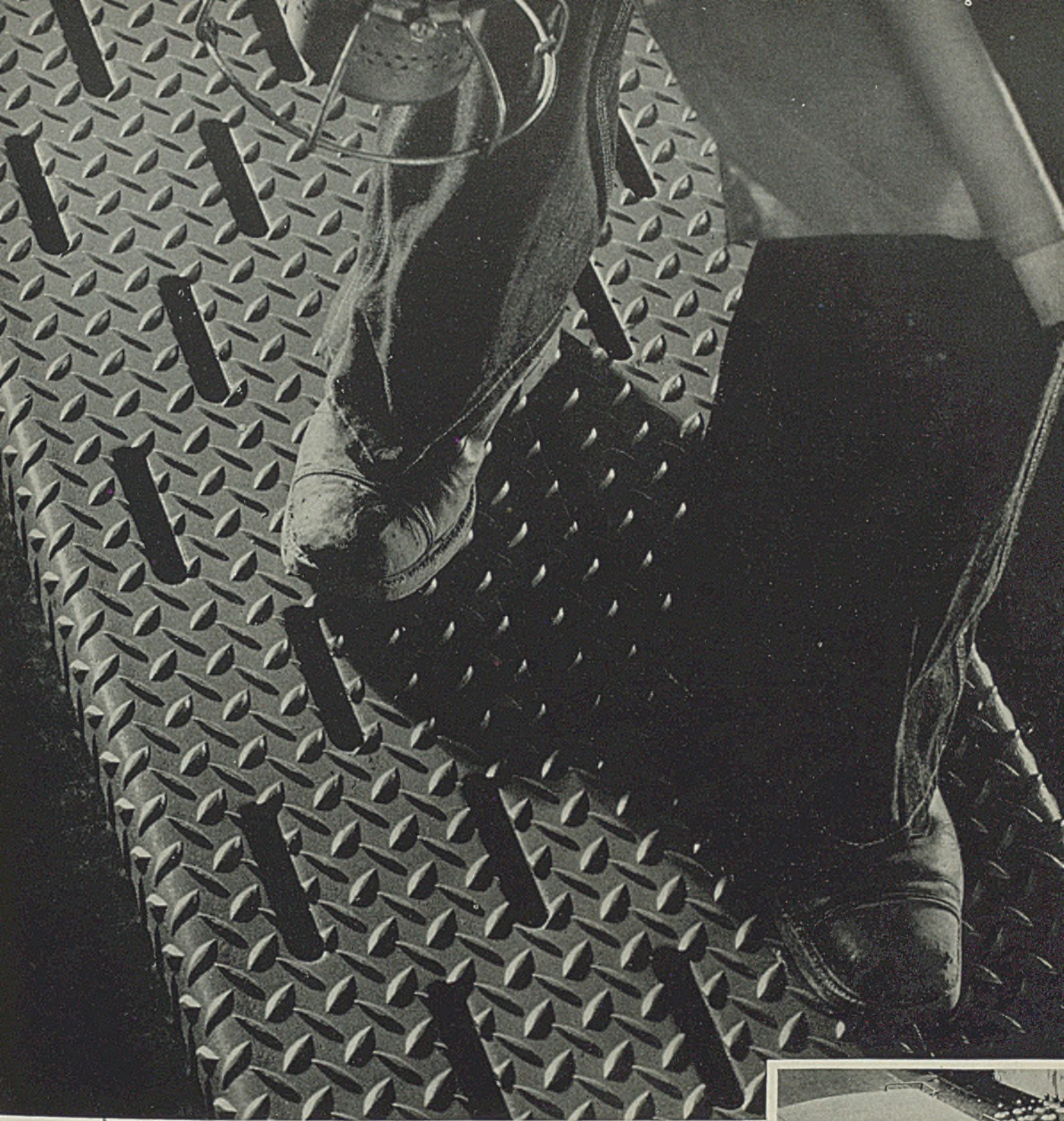


Fig. 8—Some idea of the size of these gear casings can be had from this view showing an intermediate casing section being lowered into position for a shop test. Bearing seats at the top of each side of the section have been bored by the same machine from the same end to assure perfect shaft alignment. The three main sections making up a complete casing are annealed before machining to relieve welded stresses and to assure permanent alignment for the bearings

Fig. 9—This double-unit geared-turbine propulsion set employs a high-pressure turbine at right and a low-pressure turbine at left. The unit is being assembled for a test run, the high-pressure turbine rotor is just being lowered into position; the low-pressure rotor is already in place. Note each turbine has its own gear set, in turn connected to a common gear set

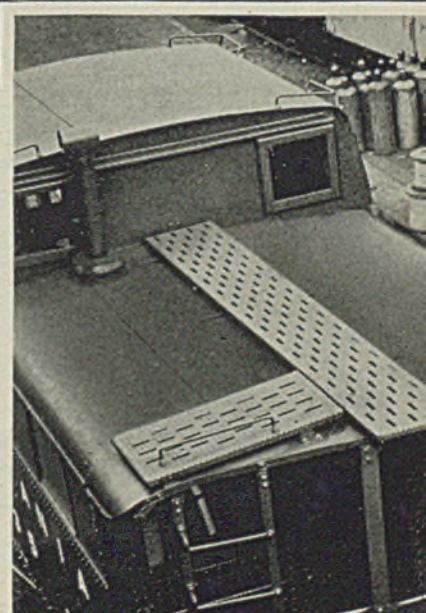




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## Substitutes for the

# BRONZES

THE PRESENT war emergency has increased the demand for alloys containing copper and tin to such an extent that allocation of the available supply of these metals is a problem. Scrap is still being gathered and delivered to the refineries and through them again made available to the market in the form of nonferrous ingot metals of a variety of different compositions, thus reducing the demand for the pure metals from which to make the alloys. And right here a serious difficulty is encountered.

Since the scrap is of a heterogeneous character and seldom is carefully sorted by those who definitely know its composition, the refiner can only guess at the probable composition of any individual piece. While his guess is usually good, some errors will occur. Consequently, in charging a furnace with a mass of such scrap there is bound to be intermixed with phosphorus bronze, for example, some brasses or maybe an occasional piece of even more objectionable material such as aluminum bronze.

Consequently the resulting ingot must be permitted to contain small percentages of elements that would not be present at all were the same type of alloy produced from pure virgin metals. Furthermore, in order to reduce the percentage of undesired elements in such ingot metal, the ingot metal manufacturer must have available a certain proportion of pure virgin metals to add to his scrap if he is to be able to produce

By N. K. B. PATCH  
Lumen Bearing Co.  
Buffalo

an ingot that meets the usual rigid specifications.

Scrap metal refineries are doing their utmost to supply a high grade of raw material of relatively accurate composition, but the quantity is limited both by the amount of available scrap and the amount of virgin metals allowed them under the government's allocation plan. The shortage of copper, tin, zinc and aluminum has resulted in government prorating the available supply. This brings up the possibility of use of substitutes for nonferrous castings, forgings, and rolled stock such as sheets and tubes and the like.

This article is concerned particularly with castings in nonferrous alloys. Such items are used generally in places where little or nothing else will serve satisfactorily. However, present conditions demand the use of substitutes even in places where nonferrous castings are preferred. But in ordnance work, it is particularly important to decide what shall be made in nonferrous metals and what can be made from something else.

Furthermore, even those parts that must be made of nonferrous castings may not be able to utilize the compositions best suited for that service. For example, certain valves demand both tightness against leakage and bearing resistance. This

requires a bearing metal as well as a tight hydraulic metal. Such castings are generally made from the nickel bronzes which combine relatively high strength and good resistance against leakage and at the same time have a definite bearing value and thus are known as bearing alloys. An insufficient amount of tin may make it necessary to use high strength alloys that contain either not as much or possibly no tin.

Manganese bronze would of course suggest itself as such a substitute, but manganese bronze contains a high percentage of zinc, a metal which is also limited in available quantity at the present moment and must be allocated to insure its delivery to those who will make the most effective use of it. Silicon bronzes likewise contain a considerable quantity of zinc. Thus it will be seen that the zinc miners and refineries must increase their production of this important metal to be combined with copper to produce the alloys that will serve as substitutes for the composition in which now tin plays an important part.

Tin is not mined in this country and there is a relatively small percentage of normal supply in the visible supply of the future due to the cutting off of all imports from the Far East. Copper of course is produced in this country, but our production is inadequate to meet present requirements. Therefore we must import an additional quantity, a supply that may not be available for some time or until shipping facilities are adequate to import South American copper. There is a certain amount of tin available from South America also, but as yet no refineries appear ready to work it—although it is reported that a refinery is being built and equipped to handle the Bolivian tin ores and this will probably be in operation some time the latter part of 1942. In the meantime we must depend upon the supply of tin already in this country. Additional quantities of tin may also be made available by cutting down consumption in nonessential industries.

These may postpone the day when

TABLE I—Nonferrous Metals Production Statistics

	Refined Copper, Net Tons			Pig Lead Net Tons	Slab Zinc Net Tons	Aluminum
	Primary	Secondary	Total			
1941.....	1,324,229*	92,767*	1,416,996*	634,888	864,026	850,000,000 pounds*
1940.....	1,267,823	125,270	1,393,093	585,480	706,100	412,600,000 pounds
1939.....	970,559	116,039	1,086,598	497,991	538,198	148,367 metric tons
1938.....	813,832	90,281	904,113	408,539	456,990	130,129 metric tons
1937.....	1,080,467	156,554	1,225,541	533,215	589,619	132,759 metric tons
1936.....	803,064	130,912	933,976	399,156	523,166	102,028 metric tons
1935.....	570,947	141,978	712,925	324,560	431,499	54,113 metric tons
1934.....	420,853	110,687	531,540	311,236	366,933	33,646 metric tons
1933.....	315,317	88,434	403,751	263,676	324,705	38,600 metric tons
1932.....	395,993	66,883	462,876	281,941	213,531	47,600 metric tons
1931.....	762,133	62,266	824,399	442,764	300,738	80,500 metric tons
1930.....	1,097,611	136,021	1,233,632	643,033	504,463	103,890 metric tons

\*Estimated.





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CAUSE	CORRECTION
Improper handling	A common group of causes is responsible for the failure of tool steels. These causes are: (1) improper handling, (2) improper heat treatment, (3) improper grinding, (4) improper storage.
Breakage	Use of all important tool steels should be accompanied by a conservation control card. This card should be filled out and attached to the tool. It should be used as a guide to the proper handling and use of the tool.
Excess tool life	When tool steels are used in a conservation control plan, the life of the tool is extended. This is because the tool is used in a controlled manner and is not subjected to excessive stresses.
Wear	Tool steels should be used in a conservation control plan. This plan should be used to control the use of the tool and to prevent wear.
Repair	When a tool is worn, it should be repaired. This should be done in a controlled manner and should be done by a qualified person.





we must turn to substitutes for the copper-tin alloys so vital in the successful operation of many non-ferrous castings such as parts for airplanes, guns, battleships and tanks. Already a definite change is taking place in certain castings specifications which permit of the use of compositions much lower in tin than formerly. The substitution of soft brasses for the harder brasses and yellow brass for some of the red brasses in civilian work took place months ago. Probably civilian items will be changed even to using cast iron instead of brass.

All such changes serve to increase the available supply of copper, tin, lead, zinc and aluminum for the war work. By the careful co-operation that the present emergency demands, designing engineers working with competent foundrymen and metallurgists can further conserve these metals.

It is worthy of note that the United States Department of Commerce Federal Specifications Board has just issued an addendum permitting the substitution of either gray iron castings, malleable iron castings or steel castings in place of some aluminum bronze castings now called for under specifications QQ-B 671a. The addendum notes that the substitution of these ferrous alloys must be done only when such materials will do a reasonably passable job in the service for which they are to be used, it being recognized that the ferrous metals do not

have the same resistance to corrosion as the nonferrous aluminum bronzes. Therefore under conditions of corrosion it is probable that the engineer in charge will not permit such a substitution. Too, there are other limitations to be considered in picking out one of the three ferrous alloys that may be used.

Remember there are certain places where it is inadvisable to substitute other compositions. For example, worm gears in motor trucks for the military services must give reliable continuous service. Bronze gears for such use must be of the highest quality and that means the copper-tin bronzes. Substitution of an "almost as good" bronze in these places is not advisable. In certain operating parts of guns for battleships and cruisers, nothing but the best should be used—copper-tin bronze again.

Then there are many instances where aluminum bronzes are so much to be preferred that even with the shortage of both copper and aluminum it would be ridiculous to permit the substitution of ferrous alloys. However, special compositions of manganese bronze may possibly be substituted for aluminum bronze in certain instances.

The development of specially hardened compositions of copper and zinc containing some manganese, iron, tin and aluminum has made available a series of compositions that are quite satisfactory for high-strength purposes. Recently special

types of these alloys have been developed with improved bearing value by making additions which produce some hard constituents. The resulting composition contains a reasonable plastic or soft matrix in which is distributed harder crystalline constituent forming the bearing-supporting medium.

An increasing amount of research is being done along this line with a view to the production of bearing alloys that can be substituted for copper-tin and copper-tin-lead bearing alloys. However, it is well understood by metallurgists that the prospects are limited and that there is little hope of developing anything that will serve as well as the copper-tin bronzes.

Some other bearing alloys are available that work well, but they also contain metals that are now limited in their availability. Consequently the whole problem of substitution for copper, tin, zinc and aluminum is exceptionally difficult. It certainly cannot be solved without the full co-operation of designing engineers with the metallurgists and foundrymen who understand the problem and who can thus bring to bear the valuable experience that has been acquired during the last 30 or 40 years.

## Ohio State Issues Bulletin on Flow Valves

"Steam Flow Through Safety Valves" is the title of bulletin No. 110, a 126-page publication recently issued by the engineering experiment station of Ohio State university, Columbus, O.

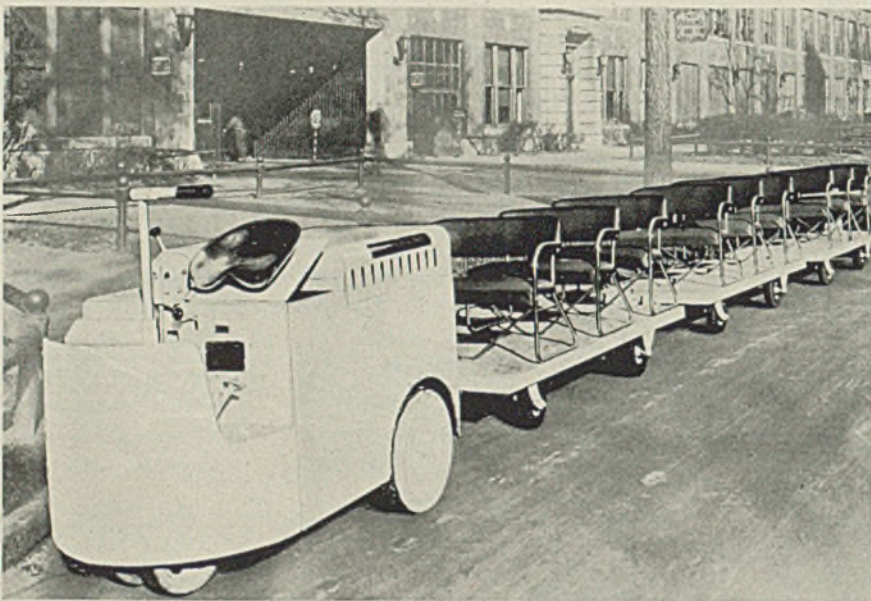
Written by Eugene K. Falls, the booklet embodies descriptions of the research work conducted by the author during 1938 to 1941 as a graduate student. Tests included in the bulletin have led to certain helpful suggestions for increasing the accuracy of establishing rated relieving capacities of safety valves designed primarily for power boilers, according to engineering school.

## Coating Prevents Broken Glass from Shattering

To prevent injury caused by flying pieces of glass broken by vibration during bombing raids, Mass & Waldstein Co., Newark, N. J., is offering a newly developed transparent protective coating for windows. Window or plate glass treated on both sides with this product, called Glassshield, is in effect turned into safety glass.

According to the manufacturer, a coated pane may break as the result of a bomb concussion, but it will not shatter. The coating which is applied with a brush does not interfere with vision or light transmission.

## "Intra-Plant Express"



NOT A SIGHT-SEEING train, but a tractor and trailer outfit being offered by Mercury Mfg. Co., Chicago, for transporting personnel and visitors in the "acres of plants" now springing up across the nation. The "intra-plant train" shown consists of an easily maneuverable electric truck, dubbed the Tug, and especially designed trailers for accommodating passengers. Self-couplers simplify making up the "train," and rubber tires on the tractor and trailers promote a smooth ride



# What Price Victory ?

The price of Victory is WORK.

It is work that gets raw materials from the ground, work that builds furnaces and machines, work that produces and fabricates steel, work that will win the war.

Nature has given America abundant mineral resources and tremendous manpower. Free enterprise has developed in us initiative and inventiveness and accomplishment. Now we must set these mighty forces to work with purposeful direction and willing cooperation.

When the dictators command, their millions respond immediately, unquestioningly, unreservedly. In America, it is up to every citizen to be his own dictator, to command himself to WORK immediately, unquestioningly, unreservedly.

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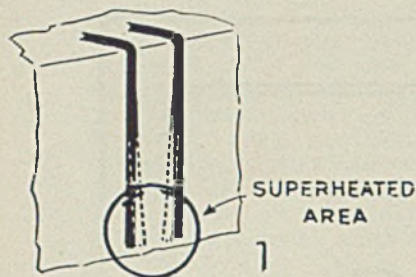
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# Where Should HEAT-TREATING

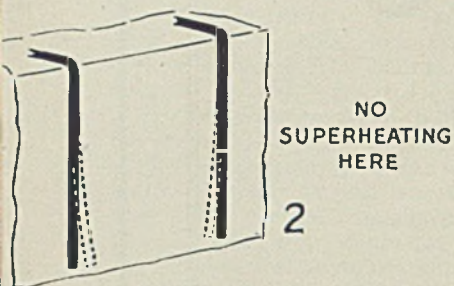
## Heat Go?

... and how salt bath furnaces can be designed to control its distribution



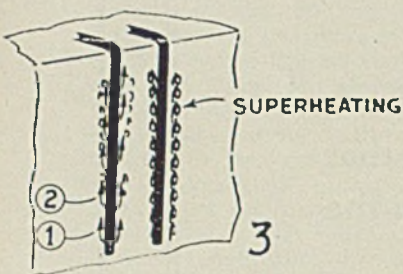
SUPERHEATED AREA

1



NO SUPERHEATING HERE

2



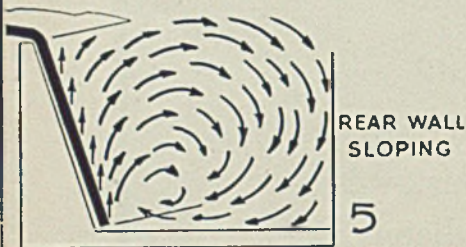
SUPERHEATING

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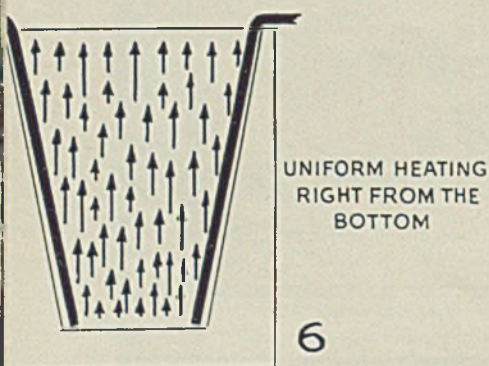
NO SUPERHEATING HERE

4



REAR WALL SLOPING

5



UNIFORM HEATING RIGHT FROM THE BOTTOM

6

THE OBVIOUS answer to "Where should the heat go?" is that it should go into the work as rapidly and as uniformly as possible and without causing superheating.

To accomplish this in a salt bath, the heat must first be generated within the pot in such a manner as to insure the best distribution—no matter what kind of work is placed in the pot, as is pointed out by Upton Electric Salt Bath Furnace Division, Commerce Pattern Foundry & Machine Co., 7456 Melville at Green, Detroit, who gives these additional pointers. Moreover, most of the heat should remain in the pot until it is removed as an integral part of the work itself.

### Must Avoid Hot Spots

Concentrated hot spots must be avoided—otherwise cracking of large pieces being treated at high temperatures is likely to result. At lower temperatures, superheated areas will swiftly decompose salts, and a carburizing bath cannot do its work if it is "out of balance."

The highest heat-treating speeds possible are accomplished with liquid baths, according to Upton. Internally heated salt baths are heated by placing electrodes in the salt itself, heating being accomplished by the resistance of the salt to the passage of the current. If the electrodes are placed close together, there is a good chance that the high heat will warp them into contact with each other or even approaching each other to cause superheating. The dotted lines in Fig. 1 show how heat-warped elec-

trodes can ruin an otherwise perfect salt bath balance. By selecting a furnace with the electrodes placed as in Fig. 2, extreme warpage (dotted lines) could not induce the superheating. Rule No. 1 should be to look for a furnace with plenty of distance (in feet rather than inches) between electrodes.

No matter where heat *should* go, it will always tend to rise vertically. This is true, of course, for any heated gas or liquid. It is possible, by the use of physical force, to make the heated substance go in *any* direction for a short distance, but when the force that turns it from its natural direction ceases, the heat immediately turns upward.

Fig. 3 shows what happens if the electrodes in the salt bath are placed vertically: The heated salt (at 1) that surrounds the bottom of the electrodes rises. As it starts up, it encounters salt that is heated at, say, point 2. These two join forces, so to speak, by combining their respective heat, and superheating immediately starts. This progressive heating continues upward along the entire length of the electrode. It is easy to imagine the temperature that exists in the salt before it even gets to the surface.

When electrodes are placed as shown in Fig. 4, the heated salt rising from any one point does not co-mingle and add its heat to salt rising from farther on up the electrode. Thus, progressive heating cannot affect the salt balance. Rule No. 2: Get pots with sloping walls.

(Please turn to Page 108)

Fig. 1—Circle shows area that can easily be superheated by a slight amount of electrode warpage if electrodes are placed too close together. Fig. 2—But when electrodes are spaced several feet apart, warpage can not produce superheating of any portion of bath

Fig. 3—Vertically mounted electrodes result in superheating of the bath because of the cumulative heating effect that occurs as the heated salt rises alongside the electrodes. Fig. 4—Mounting electrodes on a slope as shown here eliminates cumulative heating

Fig. 5—Circular pot walls aid in establishing rapid, complete, uniform circulation of heated salt throughout bath. Fig. 6—Placing electrodes on diagonally opposite corners of the pot with their ends converging near the bottom results in generating some 80 per cent or more of the heat at the bottom of the pot where it is most needed



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# Stainless Steel Fabrication

## SIMPLIFIED

... yet product meets rigid specifications and inspections which apply to all dairy equipment. Welds are mirror finished

THERE are at least two ways of looking at the fabrication of stainless steel. Some would have you believe that the fabrication of stainless steel sheets is tricky business. Others will tell you that successful fabrication of stainless is merely dependent upon learning how to handle the material and that it does not require especially complicated procedures.

At R. G. Wright Co., Buffalo, a large number and variety of stainless steel articles are fabricated for dairy plants—equipment that must pass the most critical inspection as to the smoothness of joints and overall excellence of the finished product. Yet all fabrication is done with ordinary shop equipment, and nothing but the simplest procedures are involved. The following description will afford an idea of the simplified techniques developed at this plant for producing high-quality fabrications of stainless steel.

Many pasteurizers as well as various other types of tanks and dairy equipment are produced in sizes from 10 to 3000 gallons—all welded of stainless steel. The pasteurizers are double walled vessels in which the stainless steel forms the inner chamber that contacts the milk. The outer shell is made of low-carbon steel. By means of such a unit, it is possible to heat the milk by passage of steam or hot water through the jacket. Also, similar units are used as heat exchangers.

**Material:** The stainless steel is

usually of the 18-8 variety, although some straight 17 per cent chromium is used. The material is stocked in sheets 120 inches long and 62, 48 or 36 inches wide. Sheet thicknesses vary from 10 to 24-gage. Some of the large tanks are fabricated of 24-gage material, although 14-gage is the size most widely used.

**Forming:** Equipment in the shop includes a big horizontal shear, a small shear, along with the various forming rolls and brakes ordinarily found in a sheet metal shop. A common type of vessel produced here roughly resembles a bathtub. In making this unit a large sheet is run through the rolls to give the desired curvature for the bottom, this sheet then forming the bottom and the two long sides of the vessel as shown in Fig. 1, where two workmen are clamping up such a formed sheet preparatory to welding.

To protect the highly finished surface of the stainless sheet, kraft paper is pasted to the sheet and removed only after all fabricating operations have been completed and the joints are ready to polish.

In Fig. 2 a workman is shown flanging over the end section of the vessel. These end sections are clamped over a steel pattern and the flange turned over by blows from a hard rubber mallet, the finishing of the shape being done with a steel hammer. Hand forming is employed because there is not enough volume of any one particu-

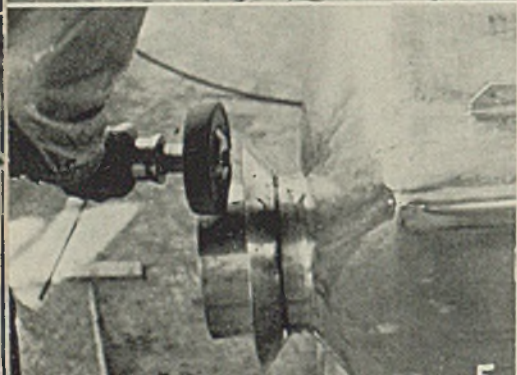
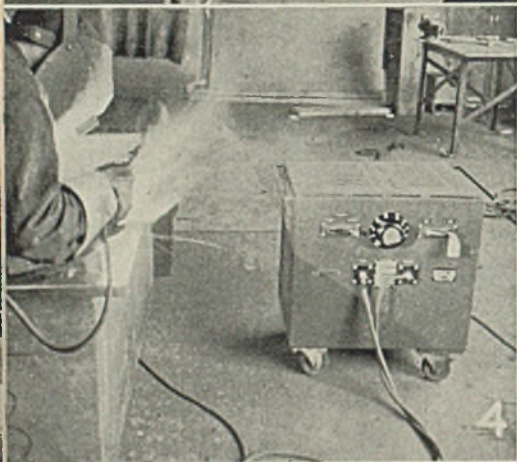
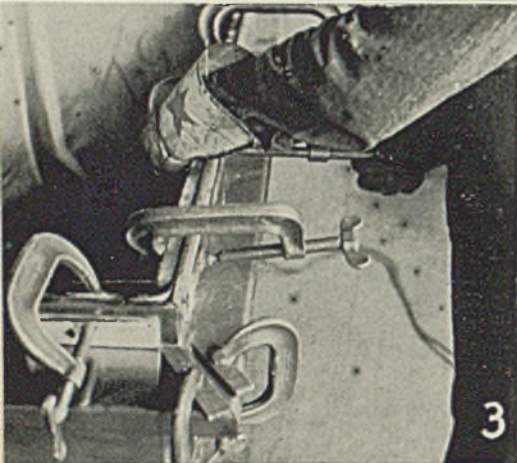
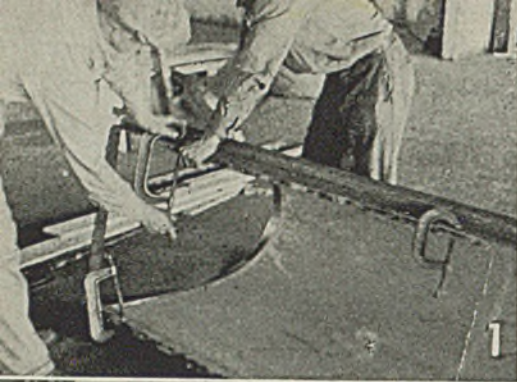


Fig. 1—After main steel forming sides and bottom of vessel is shaped, it is clamped in preparation for welding to other members

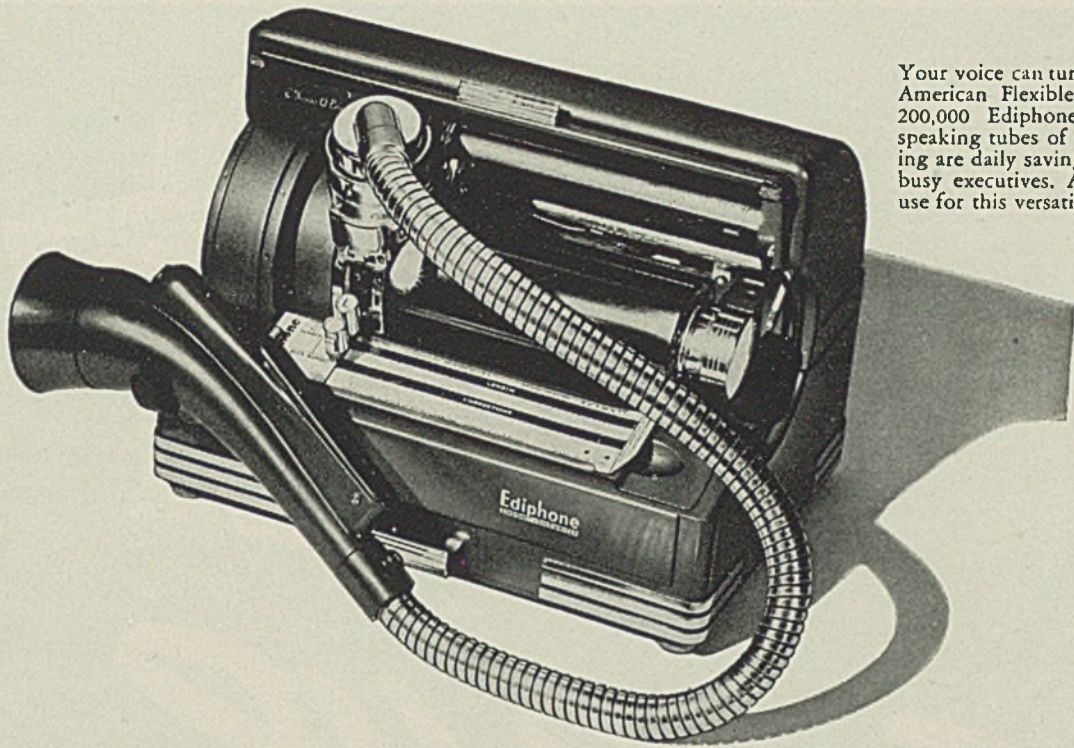
Fig. 2—Flanges of end panels are shaped over steel forms using rubber and steel mallets, a second section of the form resting on top of the sheet which is clamped between the two heavy metal sections during forming

Fig. 3—Closeup of shoulder flanges, inner stainless sections and outer low-carbon steel sheet sections clamped together for tack welding

Fig. 4—After tack welding, welds are ground flush and finish welding is done. The Weld-O-Tron unit is shown here. Note its small size, easy portability

Fig. 5—Grinding off excess metal is first step in finishing sequence





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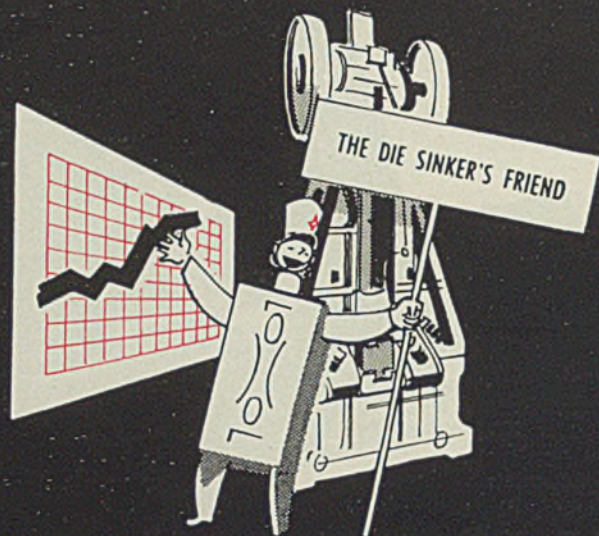
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lar model or size to warrant pressing in dies. Also the hand work is more flexible as it enables variations in size or shape to be made at practically no additional cost.

The heavy steel patterns are handled by means of a hoist and overhead jib crane since they are quite heavy. These forms are made in the plant, using steel plate and bar stock. Edges are reinforced with bar stock as shown in Fig. 2. Of course each pattern consists of two parts, the lower portion in Fig. 2 being the one over which the flange is shaped, the upper section being used with C-clamps to hold the work securely between the two sections of the pattern.

Next step is to clamp the stainless steel parts in position in readiness for welding. This is done using C-clamps. Fig. 3 illustrates a portion of a corner of one of these vessels with parts clamped up ready for welding.

First step in welding is to run a series of tack welds along each joint. On flat sheet a tack is placed about every  $\frac{1}{2}$ -inch along the seams. On curves or stiff parts, the tacks are spaced  $\frac{3}{4}$  to 1 inch apart. On 20-gage material about 20 amperes of direct current would be used for tacking, employing  $\frac{1}{8}$ -inch shielded electrodes.

Current for welding is furnished by an Allis-Chalmers Weld-O-Tron unit with an output of 50 to 75 amperes, running off a 3-phase 60-cycle 230-volt power line in the plant. The output of the unit is rated 50 amperes for continuous operation or 75 amperes on a  $\frac{1}{2}$ -hour basis. A set of six rectifier tubes and accessory equipment transforms the alternating line current to direct current for welding. Three tubes are used for low-current work. For the higher current range, all six tubes are used. The tubes in the Weld-O-Tron appear to have a satisfactory service life since it has been necessary to replace only one tube in over a year's use.

The unit appears particularly suit-

able for low-current welding. Such material as 24-gage stainless is readily welded here, and some 26-gage has been welded quite satisfactorily with this machine using 3/64-inch electrodes. For most work the machine is set at about 20 amperes and the arc held rather short. The welding unit can be seen to the right in Fig. 4.

After tack welding along the joints, which incidentally is done from the outside of the joints, the excess metal at the tacks is ground off to make the joint flush. Then the joint is finish welded, using a skip welding sequence. A bead 3 to 4 inches long is run and then about an 8-inch space is skipped, another 3 to 4-inch section is filled in, another 8 inches is skipped, and so on. Then the operator goes back to the start, filling in half of each section previously skipped as he proceeds down the length of the joint. Then he returns again to the starting point and fills in the remainder of the skipped portions as he travels the length of the joint for the third time. Finish welding is done on the same side as the original tack welding—all from the outside of the work.

A copper back-up bar is employed in laying in the finish weld. The weld metal penetrates clear through the joint. Excess metal is ground off smooth on both sides of the joint after welding has been completed.

The tack welding holds the sheet accurately in position during the finish welding so that very little warping occurs. No attempt is made to clamp the sheets tightly enough to prevent all warpage. What little distortion does occur is taken out by using a straightening bar and tapping with a hammer after welding has been completed and the clamps removed. The joints are ground smooth after straightening.

In welding it is necessary that the operator hold a steady arc, proceed along the weld at the proper speed and maintain proper arc length.

Producing a mirror finish on the

welds involves an equally simple procedure:

After being ground smooth, the rough joint is first taken down with a 14-C Manhattan combination wheel running at 3600 revolutions per minute. See Fig. 6. For an 8-inch wheel this makes a surface speed of about 9000 surface feet per minute.

Next step is to use an 80-grit Ly-onite setup wheel. This, as well as the other 8-inch wheels running at 3600 to 4000 revolutions per minute, is powered by an individual electric induction motor or one of the high-cycle motors connected into the high-cycle power system.

#### No Grease Wheels Employed

Next finishing operation is done with 120-grit wheel, followed by a 240-grit wheel. Now the paper protecting the sheet is removed and the entire vessel buffed with a flexible-shaft tool as shown in Fig. 6. This is driven by a 3-horsepower motor at 3600 revolutions per minute, a 10-inch diameter buff of Apex cloth being employed.

No grease wheels are used in the finishing sequence. The plant purchases only hard wheels. The cloth wheels are set up in its own finishing department, employing a simplified procedure. No glue is used, silicate of soda being purchased already mixed and ready to apply. The practice is to hold the wheel on a mandrel in one hand while the operator paints the silicate of soda on the surface with a brush as shown in Fig. 7.

Various grades of abrasives are kept on the bench in handy containers. The abrasive is applied to the wheel after it is coated by placing the abrasive in the round trough shown in Fig. 8 and rolling the wheel down the trough. The abrasive is then worked into the surface of the wheel by running the wheel down the steel plate seen immediately in front of the trough in Fig. 8. This produces a flat finished surface.

Now the wheels are slipped over one of the rods on the rack at the right in Fig. 8 where they are allowed to set. Wheels are resurfaced until they are worn down to the spindle. Thus no usable material is thrown away. As the wheels wear down to smaller diameters they are used for various types of operations and on parts where the smaller

Fig. 6—Flexible shaft polishing equipment speeds finishing of interior surfaces and welds

Fig. 7—Setting up polishing wheels is done without glue, thus eliminating need for heating, storing and preparing that material. Instead silicate of soda is used as the binder. An operator is brushing this material on a wheel here

Fig. 8—Abrasive is applied to the wheel after brushing with binder by rolling in a trough containing the abrasive material. Drying rack can be seen at extreme right





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Examples of the Tell How principle are in every issue of **STEEL**. You will find them in the reprints of **STEEL's** famous Shell Production series. You

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# How



Last year the official Army Ordnance bulletin gave **STEEL** magazine more mentions than any other publication for

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A complete separate section . . . time-saving guide to Priorities, Allocations and Prices—digest of Government orders, cross index of PD forms and directory of WPB

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CS MOTORS**

**—IT'S JUST ONE OF  
THE FEATURES THAT  
KEEP 'EM**

**YEARS  
AHEAD!**

J-21239



SEE PAGE 20  
AND PAGE 21

wheels can be more easily maneuvered.

For example, when the wheels are about 3 inches in diameter, they are used on the high-cycle machines for finishing in close places and for buffing in certain corners. In general, wheels are used until they are  $\frac{3}{4}$ -inch in diameter before they are discarded. To get the surface speed required, it is necessary to revolve such small diameter wheels at rather high speeds. An air motor is used for such work which makes available speeds up to 18,000 revolutions per minute. This is ample to give the surface speed desired.

The simplified setting up procedure described enables one operator to set up 150 to 200 wheels in the hour and a half from 3:30 to 5 p.m. each day. Of course in damp weather it is necessary to dry out the wheels first. Obviously, this simplified practice affords important economies in finishing costs.

In addition to the various types of vessels themselves, a large number of fittings and accessories of stainless steel are produced for the tanks. Fig. 9 shows a centrifugal impeller pump fabricated entirely of stainless steel in this plant. The completed impeller shown at the left in Fig. 9 is built up from a stainless steel shaft to which the stainless steel vanes are welded. After the welds have been finished off and polished, they cannot be detected, the finished impeller having the appearance of being made of a solid piece of stainless.

In a similar manner, the pump

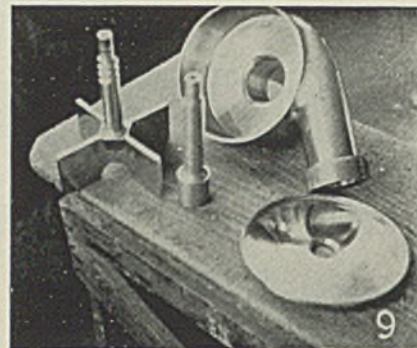


Fig. 9—Centrifugal pump fabricated from stainless plate and bar stock by welding. Mirror finished welds are almost impossible to detect

housing is fabricated from heavy sections of stainless by welding. It is this extreme flexibility of welded stainless steel construction which makes it particularly suitable for dairy equipment.

Of course the health standards governing dairy equipment are extremely severe, being predicated upon the idea that the equipment should be so designed and built as to prevent any inaccessible cracks or corners that cannot be cleaned and where germs may lodge. This means that ALL corners are made with large fleets and polished to practically a mirror finish. The practice described successfully meets these exacting requirements. The welded joints are so highly finished that they are almost undetectable on casual examination.

### Adds Accessories as Standard Equipment

Effective immediately, Harnischfeger Corp., Milwaukee, announces that its Trav-Lift cranes will include two added features as standard equipment.

All double I-beam cranes employing a motor-driven trolley will be equipped with a drag brake on the trolley. All cage-controlled Trav-Lifts will be furnished with a foot gong. Formerly, these accessories were available on special order only.

### New Booklet Urges Patent Research

War or no war, foundation of all industrial business lies in things invented. Such is the theme of a new booklet recently published by Invention Inc., of Washington, and entitled "How To Have Your Own Patent Research Department in Washington—at \$2 a Week".

The booklet describes the patent reporting service, pointing out why manufacturers should maintain pat-

ent research during the war.

Booklets are available upon request from Invention Inc.

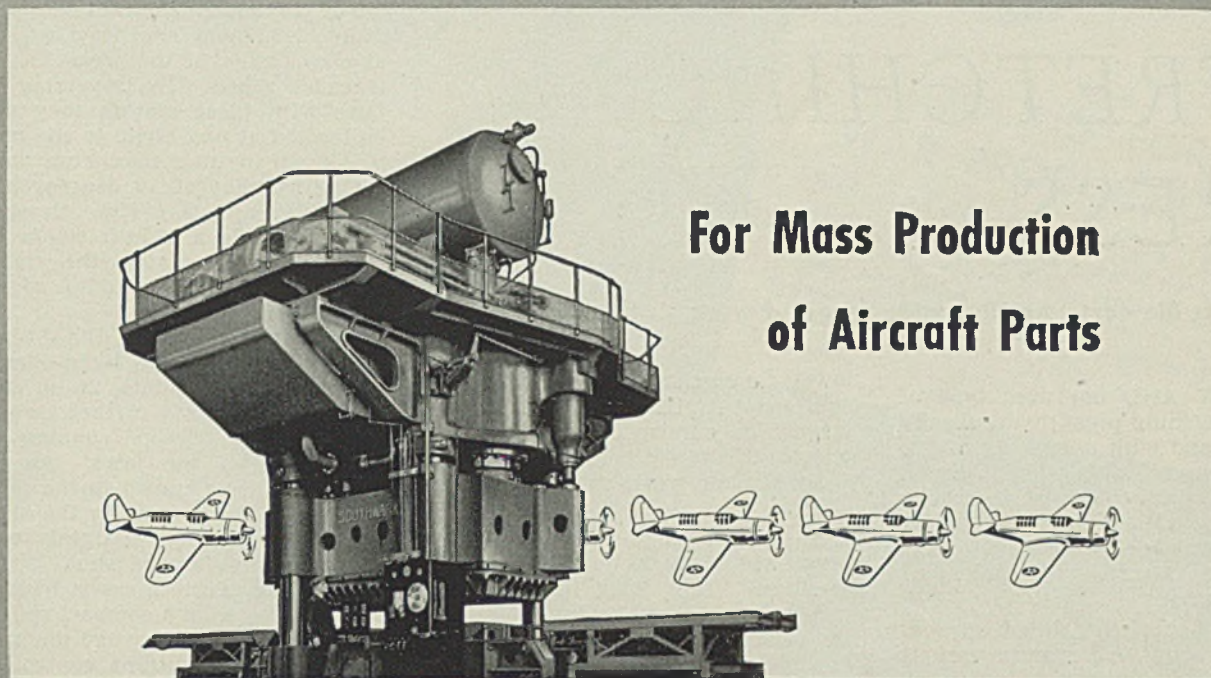
### Practice on Pipe Fittings Now in Print

Division of Simplified Practice, National Bureau of Standards, Washington, announces that printed copies of simplified practice recommendation R185-42, "Pipe Fittings", are now available. This simplified schedule lists but 1311 of the 4964 gray cast-iron fittings heretofore offered; only 1169 of the 2331 malleable-iron fittings, unions, and union fittings, and 487 of the 1271 brass or bronze screwed fittings, unions and union fittings stocked before.

General application of this recommendation will reduce varieties to 35 per cent of their former number. The items retained in the schedule, it is estimated, will satisfy from 92 to 94 per cent of all normal demands.

Copies of R185-42 may be obtained from the superintendent of documents, Government Printing Office, Washington, for 10 cents each.





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# HYDRAULIC STRETCHING PRESS

... cuts die costs, handles wide range of work

A NEW AND improved type of metal stretching press, hydraulically powered and with a capacity of 150 tons pressure, was demonstrated April 24 at the plant of Hydraulic Press Mfg. Co., Mt. Gilead, O., before a number of guests invited by Howard F. MacMillin, president of the company.

A few of this general type of press are now being operated in various metalworking industries, principally aircraft. They are a distinct departure from the conventional type of drawing press in which metal is formed between an upper ram or punch and a lower die. In the stretching press, as the accompanying illustrations show, the metal sheet is gripped in two sets of jaws, disposed on either side of a central platen which carries the forming die and moves upward to stretch the sheet to the form of the die.

Principal advantage of this type of forming is the low die cost since inexpensive wood or nonferrous alloy of the Kirksite type can be used satisfactorily for the die. The method is suitable particularly where small runs are involved for it obviates the need for machining and tooling large iron and steel dies of the type used in conventional draw presses. Scrap losses in the metal being formed are high because of the waste stock which must be trimmed from the formed piece, but this is claimed to be offset by the

lower die cost and lower cost of the equipment itself. Too, this loss can largely be eliminated by attaching sheets of heavy steel to extend from shorter work sheets into the clamps.

A few details of the new H-P-M press will show its general characteristics. The main platen, 100 inches long and 12 inches wide, is raised and then lowered by two double-acting hydraulic cylinders which provide a 24-inch stroke. Cylinders are located one at each end of the platen. They may be raised or lowered together or independently. If desired, the platen can be turned 90 degrees and located on two similar cylinders inside the press frame.

Clamping jaws are traversed hydraulically by four double-acting hydraulic cylinders, two at each end of the press, having a total pulling capacity of 21 tons each with an 18-inch stroke. Return lines on these cylinders are piped through two adjustable pressure relief valves, one for each end. Thus, if the use of a particular die makes it necessary for the clamping jaws to move in toward the main platen during the

stretching operation, this movement can be controlled through these relief valves.

For positioning the clamping jaws four gearmotors are provided, one at each corner of the press, driving threaded shafts. By traversing the jaws with these motors they may be located at any angle to the main platen up to their maximum angular adjustment of 15 degrees in a horizontal plane. The threaded shafts provide a 43-inch stroke adjustment, thus giving the clamping jaws a total horizontal stroke of 122 inches.

Clamping action of the 84-inch jaws is produced by hydraulically energized toggle joints, 21 on each side. A firm grip is further insured by providing a "bead" running the full length of the jaws. As the sheet metal is clamped in the jaws, this bead puts a crimp in the sheet which helps to hold it tightly once the jaws are clamped shut.

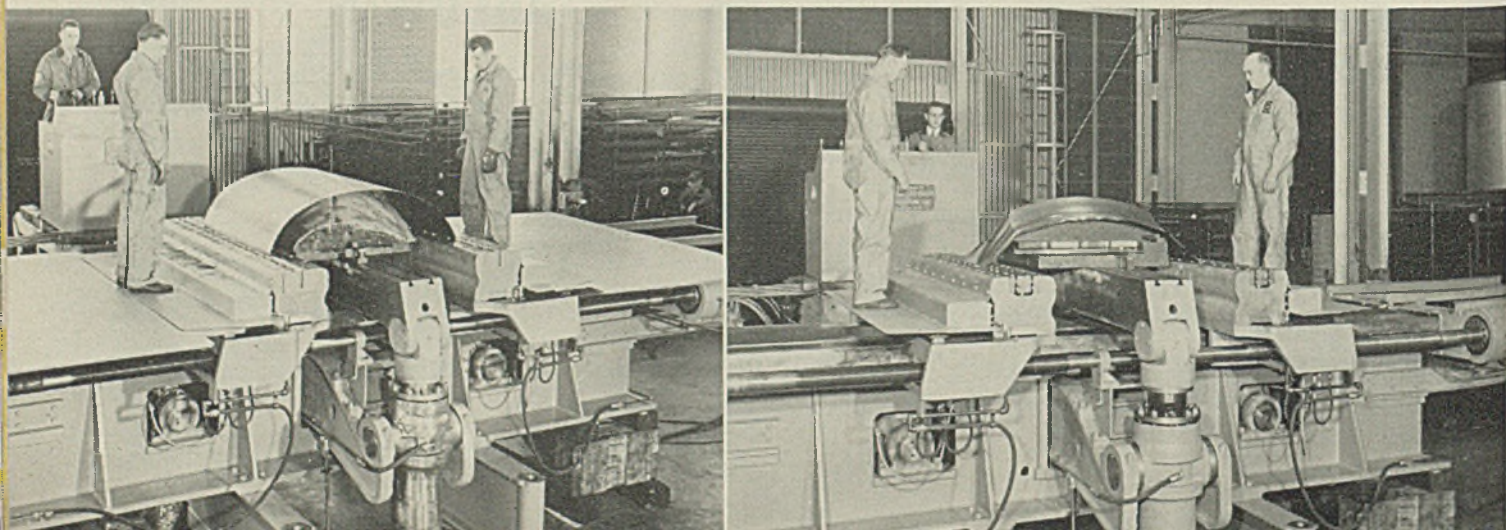
Operation of the press is handled conveniently from a compact control stand on which are located the hand levers and pushbuttons controlling the various adjustments. The operator, who must be skilled in the technique of metal stretching, watches the operation closely as it progresses and controls it through the levers at his fingertips. Success or failure of any metal stretching lies with the operator. He must know the metal he is working; he must know the action of each moving member of the machine; and he must know the capacity and limitations of the equipment.

Hydraulic pressure for the machine is generated for the open-circuit operating systems by two Hydro-Power radial pressure generators and one gear pump, all driven by one electric motor. Each of the

(Please turn to Page 125)

Fig. 1. (Lower left)—Steel sheet is placed in position in the clamping jaws of 150-ton stretching press with steel-faced wood die ready to be raised. When installed, the operators' platform will be at floor level

Fig. 2. (Lower right)—Stretched piece at conclusion of forming operation. Metal extending from jaws to edge of die on both sides as well as overlap on sides of die will be trimmed off to yield the finished part



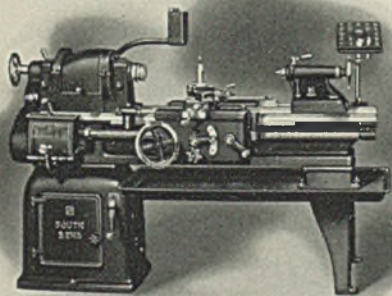




## TOOLING FOR WAR PRODUCTION

Back of the plane and tank and gun — back of our entire war program — stands the man behind the machine. In the toolroom of a large aeronautical plant this craftsman at a South Bend Lathe is doing his part in defending America.

# The Man Behind — the Man Behind the Gun!



**I**N TIME OF WAR, the man behind the machine is just as important as the man behind the gun. Back of the production lines of every war industry is our first line of defense — the toolroom. Here, where precision is of utmost importance — where tolerances are reckoned in split-thousandths — you will find South Bend Lathes.

Modern in design, built with extreme precision, South Bend Lathes are fast and

accurate on the most exacting classes of toolroom work. Their wide range of spindle speeds permits machining with maximum cutting tool efficiency. Their versatility facilitates quick change-over through a minimum of set-up time.

South Bend Lathes are made in five sizes: 9", 10", 13", 14½", and 16" swing, with toolroom or manufacturing equipment. Write for catalog and the name of the dealer nearest you.

# SOUTH BEND LATHE WORKS

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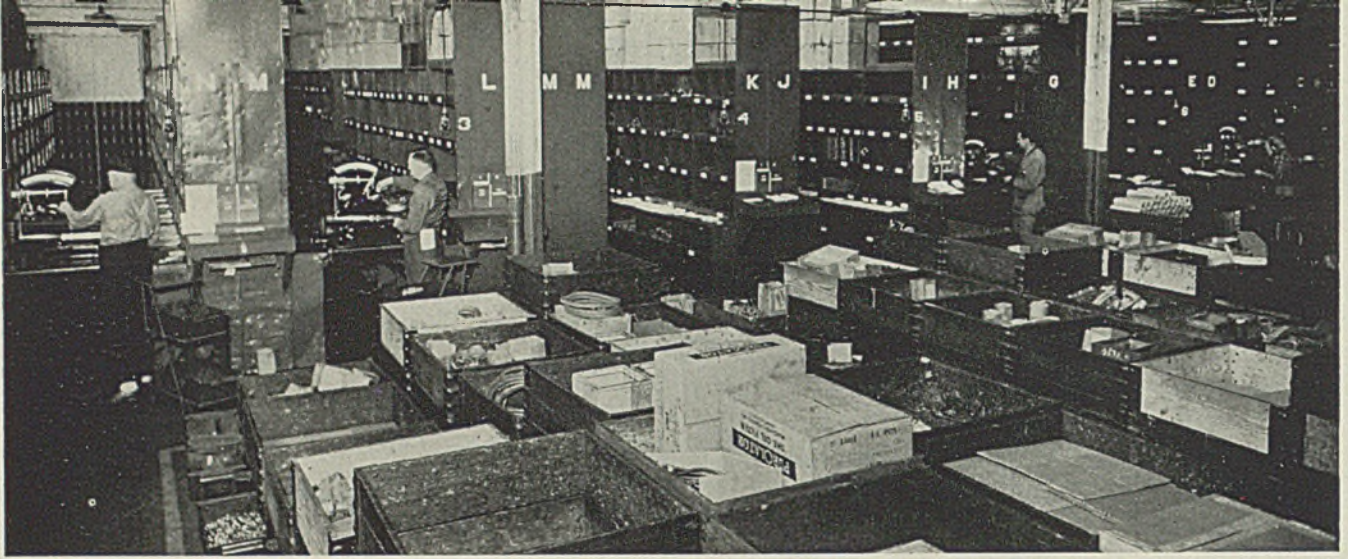


Fig. 1—In this stockroom more than 30,000 items are stored. As can be seen, four of the aisles between the parallel rows of bins in the back are now equipped with movable Toledo counting scales

by Toledo Scale Co., Toledo, O., are utilized for this great task.

In the No. 1 stock room, shown in Fig. 1, there are more than 30,000 items ranging from a cork seal, weighing but a tiny fraction of an ounce and running 2080 to the pound, through the entire range of washers, cap screws and fittings to the larger parts beyond the 40-pound limit of the counting scale. However, these latter parts are not numerous and obviously present no counting problem.

As shown in Fig. 2, the stock bins are aligned in parallel rows back to back with an aisle faced by the open bins on either hand. These bins have 13 sections with an average of 12 compartments per section, so in each aisle there may be 150 to 175 different parts on each side, or a total of 300 to 350 small parts to be counted and issued from each aisle.

Formerly there was stationed at each aisle a Toledo counting scale to which the operator brought each item for counting. If he traveled the length of the aisle from the stock bin to the scale he covered 40 feet, and if he returned the overage to the bin there was a total of 80 feet traversed. If this were repeated for every one of the 300 items in any aisle and the average round trip from bin to scale were estimated to be 40 feet, the stock clerk would cover more than 2 miles in one aisle alone, and at a cost of not less than an hour's time.

To remedy this condition, a unique method for bringing the scale to the bin was devised. Heavy Z-bar tracks that run the full length of the aisle on both sides were attached to the front supports of the

(Please turn to Page 124)

Fig. 2—Scale is mounted on platform whose shieve wheels roll on Z-bar trucks fastened to bins. Note telescoping axles which permit scale to be used on aisles of different widths without changing platform

## Movable Scales Speed

# WEIGH-COUNTING

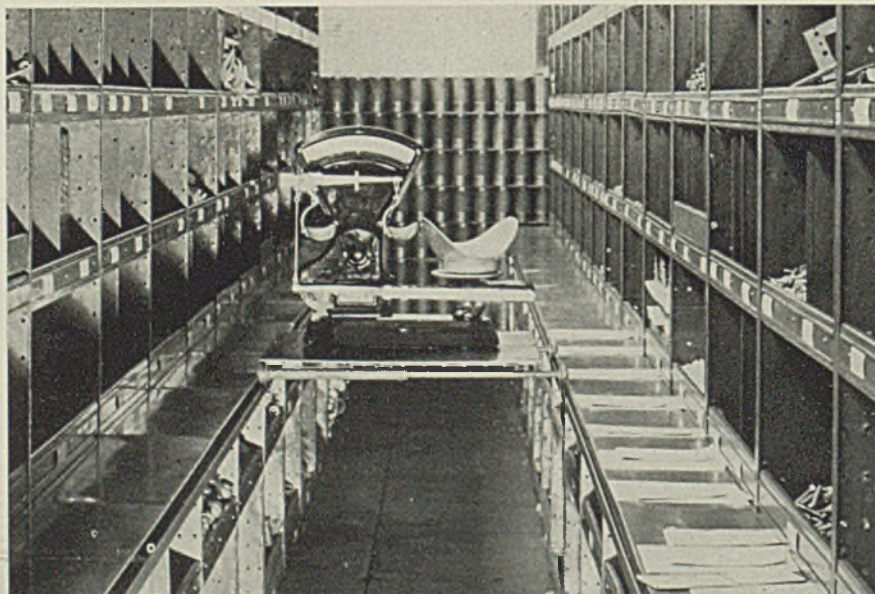
... from over 40,000 different items in stock; eliminate miles of walking and more than 8 man-hours of time per day

A UNIQUE movable scale system developed at Waukesha Motor Co., Waukesha, Wis., speeds the sorting and counting of parts from stock for the assembly lines and thus directly aids materials handling. It has been estimated to eliminate at least 8 man-hours of time per day as well as miles of walking for the stock clerks.

More than 50 different models of engines ranging from a 3-horsepower single-cylinder laboratory testing engine to a 450-horsepower 6-cylinder gas engine are built at this plant. Besides this great range of models, there are as many as six to a dozen variations of each model

to suit the individual customer's needs—special flywheels or housings; special manifolds; special oil pans, flat or automotive type; special governors; and special pistons or cylinder heads, just to mention a few.

The magnitude of the materials handling problem involved in assembling parts for the production lines at this plant is evident. The production stores and stock rooms must carry in stock over 40,000 different items, and these must be sorted and issued in exact count to the assembly lines for each day's run as scheduled by the production dispatchers. Counting scales made



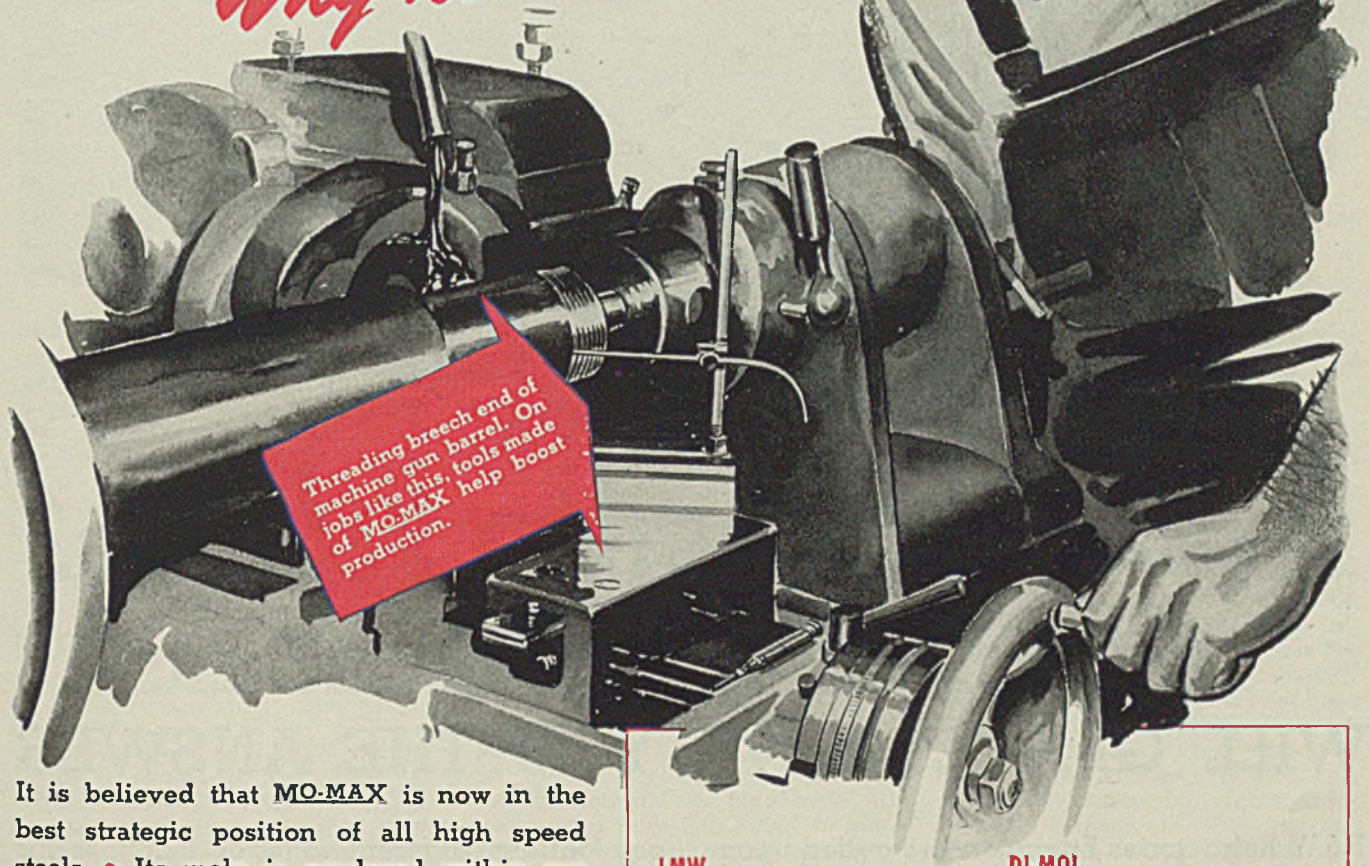


Some time you will change to

# MO-MAX

## HIGH SPEED STEEL

*Why not now?*



It is believed that **MO-MAX** is now in the best strategic position of all high speed steels • Its moly is produced within our borders • So is the less than 2% of tungsten required • The vanadium is only 1%, the lowest in any commercial high speed steel • Its economy is outstanding • Its cutting quality is 20% better than 18-4-1 • It has been commercially established for more than nine years • Change now to the ultimate high speed steel • Fourteen high speed steel makers manufacture brands of **MO-MAX** and make it readily available.

*For Technical Data Booklet*

Write any of the steel makers listed or to The Cleveland Twist Drill Co., Cleveland, Ohio.



### **LMW**

Alleghany Ludlum Steel Co.

### **MOHICAN**

Atlas Steels, Ltd.

### **BETHLEHEM HM**

Bethlehem Steel Company

### **MO-CUT**

Braeburn Alloy Steel Corp.

### **STAR MAX**

Carpenter Steel Co.

### **MOLITE 8**

Columbia Tool Steel Company

### **REX TMO**

Crucible Steel Co. of America

### **DI-MOL**

Henry Disston & Sons, Inc.

### **REX TMO**

Halcomb Steel Division  
Crucible Steel Co. of America

### **MOGUL**

Jessop Steel Company

### **TATMO**

Latrobe Electric Steel Co.

### **S.T.M.**

Simonds Saw and Steel Co.

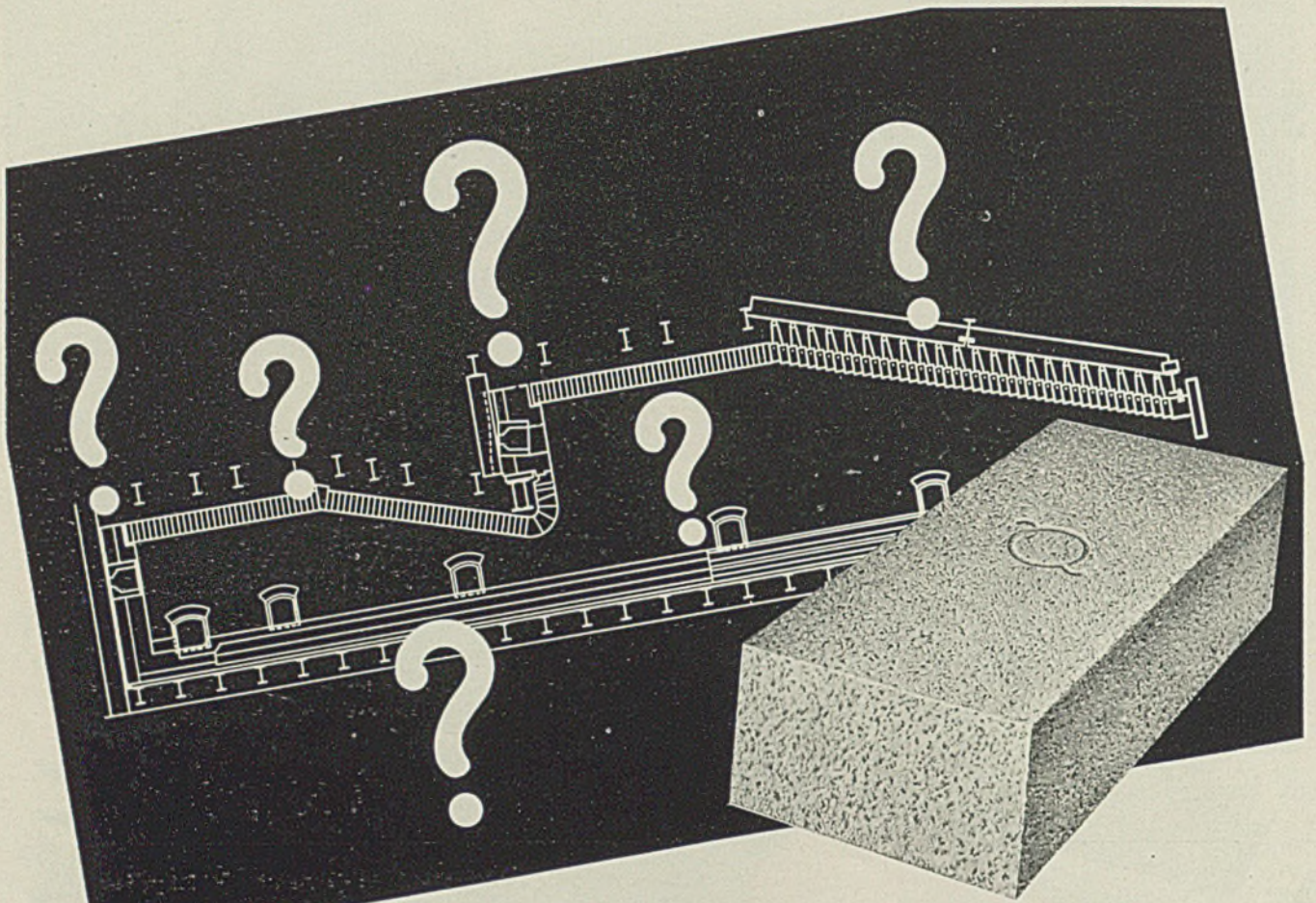
### **MO-TUNG**

Universal-Cyclops Steel Corp.

### **VUL-MO**

Vulcan Crucible Steel Co.





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B&W Refractories Engineers are called upon regularly to answer such questions . . . and with good reason . . . because refractory application is not a matter of using one refractory material for an entire furnace. It may be a complex, multiple problem.

The selection of refractories for various services is a job for a trained specialist.

For example, in the above furnace there

are fourteen different zones or locations for refractories . . . each with its own special requirements. Four different types of refractories may be used in one or another of these locations.

B&W Engineers know from long experience . . . *which* refractory is best . . . *where*. Also, they can advise on the most suitable construction for any particular refractories application.

R-153

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# **BABCOCK & WILCOX**



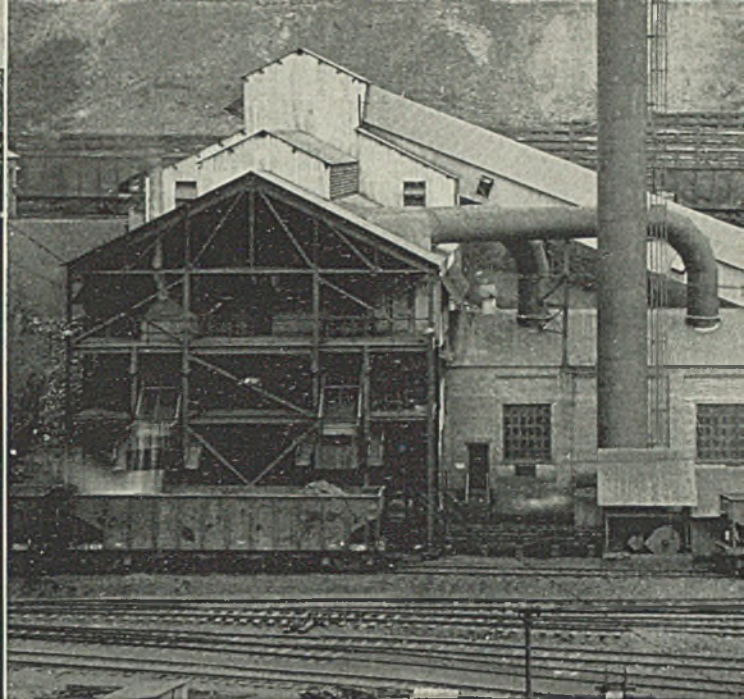
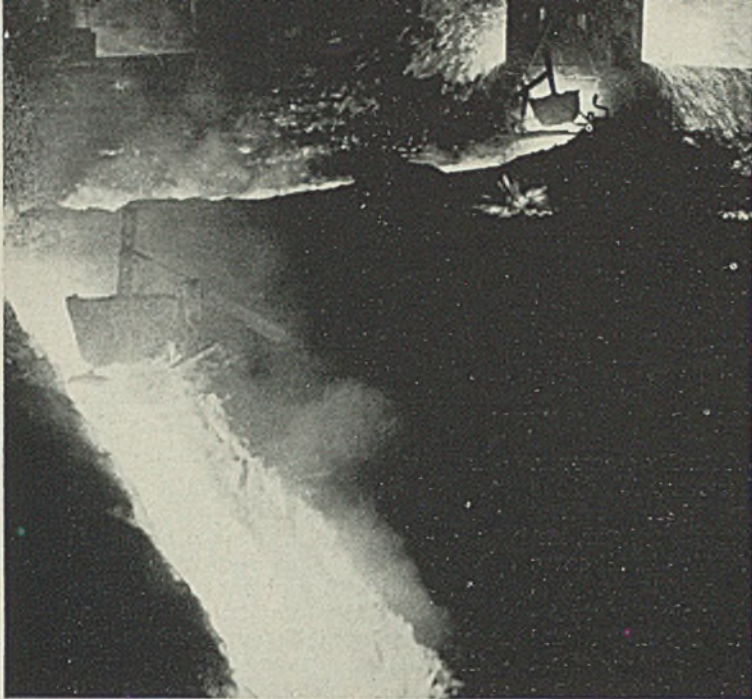


Fig. 1. (Left, above)—Cast of iron coming from blast furnace burdened with 40 per cent sinter

Fig. 2. (Right)—Discharge end of 2-strand sintering plant. Fan house at right and raw materials conveyor at rear

ENGINEERS AND OPERATORS of Republic Steel Corp. have recently completed a series of experiments on increasing pig iron output of both large and small blast furnaces by increasing the per cent of sinter used in the furnace burden. Test runs covering a period of over four years have been made on blast furnaces in both Cleveland and Youngstown plants of the company. What has been and is now being done at these two plants can be done, it is believed, with most, if not all, of the northern blast furnaces in the country.

In brief, Republic has found that by increasing the per cent of sinter in the furnace burden to as much as 40 or 45 per cent, the output of iron as shown by different furnaces can be increased anywhere from 10 per cent to 19 per cent.

Present sintering capacity of the country is estimated to be about 13,000,000 tons. Not all of this, however, can be considered as available for the preparation of sinter of the high quality required to secure the most satisfactory blast furnace operation. A program, therefore, which involves increasing the percentages of sinter in the furnace burden from the present average of 10 or 15 per

## USE OF SINTER

### To Increase Blast Furnace Output

cent to upwards of 45 per cent would necessarily involve the construction of considerable new sintering capacity throughout the country.

The time factor, as compared with the time to build new blast furnaces, is markedly in favor of such a program. It should be possible to build a new sintering plant of, say 1200 tons capacity per day, in something less than six months. Only about 500 tons of steel are required in its construction and the plant with all necessary equipment, ready to run, can be constructed for approximately \$600,000—or about 5 per cent of the cost of a modern blast furnace.

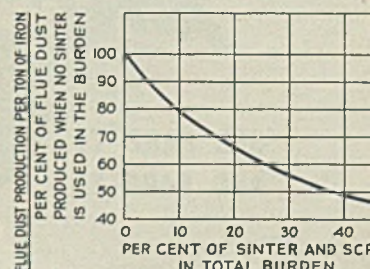
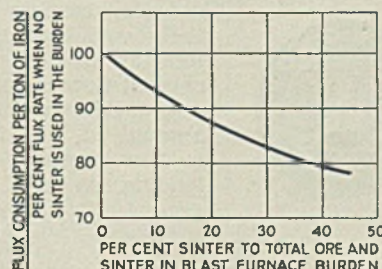
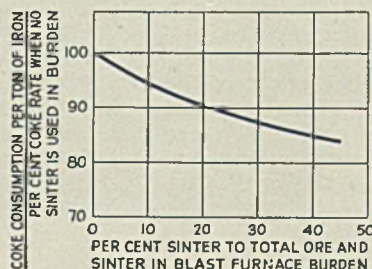
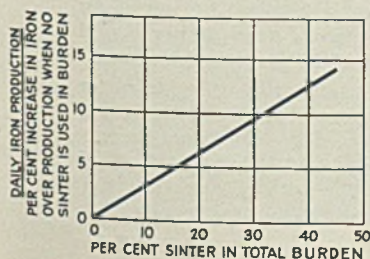
Actually the difference in the expenditures involved is even more than this since with a new blast furnace there is additional coke oven

capacity required which is not the case with a new sintering plant.

Fig. 3 is a composite average of the performance of several Republic Steel blast furnaces operating on basic and bessemer iron. The increase in daily iron production bears an almost direct relationship with an increase in the percentage of good quality sinter in the blast furnace burden up to 45 per cent. No experience on the furnaces beyond this point is available; but results from another furnace on 100 per cent sinter tend to indicate that beyond 45 per cent there is little further advantage other than the increased iron units in the sinter. One of the prime reasons for this is that the burden becomes so open that the intimate gas-solid contact is not being maintained.

Another advantage to operating with increased percentages of sinter in the burden is the lower coke rates per ton of iron as shown graphically in Fig. 4. This again is a composite average of the several fur-

Fig. 3. (Left to right, below)—Effect of sinter on the daily iron production. (Average of furnaces on basic and bessemer iron). Fig. 4—Effect of sinter on the blast furnace coke rate. (Average of furnaces on basic and bessemer iron). Fig. 5—Effect of sinter on the blast furnace flux rate. (Average of furnaces on basic and bessemer iron). Fig. 6—Effect of sinter on the flue dust production. (Average of furnaces on basic and bessemer iron)







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**SEALED SLEEVE  
BEARING MOTORS**

**—AND THAT'S JUST  
ONE WAY THEY'RE**

**YEARS  
AHEAD!**

J-21238



SEE PAGE 20  
AND PAGE 21

**Effect of Sinter on Blast Furnace Operations**

Per cent	Per Cent of			
	Consumption		Production	
	Coke rate (A)	Flux rate (A)	Flue dust (B)	Daily Iron (C)
0	100.0	100.0	100.0	100.0
10	94.2	92.9	79.2	103.2
20	90.4	87.4	66.0	106.3
30	87.2	82.7	56.0	109.5
40	84.8	79.4	49.2	112.5
45	83.9	78.1	46.4	114.2

Based on the:

- (A) Per cent of sinter to the total ore and sinter in the blast furnace burden.
- (B) Per cent of sinter and scrap in the total burden.
- (C) Per cent of sinter in the total burden.

naces under test. Actually, however, the coke and flux consumption of the individual furnaces differed slightly at various percentages of sinter, but the percentage reduction in all cases was nearly the same. Whether this was the result of operating variations between the Cleveland and Youngstown furnaces or the effect of the quality of the sinter available could not be determined. The important thing was that a reduction in coke rate was evident in all cases. Since no additional coking facilities are required for expanded sintering program, what this means is that there is an actual decrease in coke consumption which is pure gain.

Fig. 5 shows the markedly lower flux per net ton of iron produced as the percentage of sinter in the blast

furnace burden is increased. Also substantially less flue dust is produced as the percentage of sinter and scrap in the furnace burden is increased. This is shown in Fig. 6 where with 45 per cent of these materials in the total burden the flue dust produced has dropped to less than half that present in a furnace operating a sinter-free Lake Superior ore burden.

In the accompanying table is summarized the effect of sinter on blast furnace operations. Reduced to specific terms it can be said that a blast furnace rated at 1000 gross tons per day, consuming only its normal amount of coke, and with scrap being held practically constant can produce about 140 more tons per day with 45 per cent sinter in the burden.

**Where Should Heat Go ?**

*(Concluded from Page 92)*

Since the motion of the heated salt is directly upward from the electrode, it is replaced by cooler salt from the bottom of the pot. The resultant circulation action, Fig. 5, is rapid, complete and uniform with the salt moving down the vertical wall toward the bottom of the pot for preheating. This natural, enforced circulation has proved especially valuable on large-size work and on small work where rapid uniform heating at high speed is required.

Saw blades present an interesting problem in heat treating and illustrate why electrodes are placed at diagonal corners. Saw blades are long—30 inches or more—and they must be heated uniformly and rapidly. All the salt in the extremely deep pot they require must be uniformly heated. This means that heat must be supplied at or near the bottom.

To get the most heat there, electrodes can be placed in diagonally opposite corners of the pot with their ends converging at the bottom as in Fig. 6. The greatest current flow is at the bottom of the pot. Consequently, the greatest amount of heat is generated there to flow upward, intermingling and lending its heat to the work sus-

ended in the pot. Rule No. 3: Be sure heat is generated normally at the bottom of the pot.

Even in high temperature work, where superheating is not as important a danger as it is in the carburizing baths, there is no concentration of heat. The electricity heating the salt spreads the heat over the entire area of the pot.

With such a salt bath furnace, high-speed tool steels of half molybdenum, half tungsten or even all molybdenum are now being hardened with absolute certainty of uniform results. This principle of operation has made the changeover from 18-4-1 types surprisingly easy, and there is little experimenting to determine proper temperatures and time. Once determined, results can be duplicated with absolute certainty.

Users of this type of electric salt-bath furnace have found that there is no decarburization—even on all-molybdenum alloys—and the amount of size change of tools during hardening is under perfect control. This means that thousands of molybdenum hobs—hardened in these furnaces—are being sold without grinding after hardening.

Properly hardened molybdenum high-speed steel tools will be found to have the same cutting characteristics as 18-4-1 high-speed steel cutters.



# FERRACUTE AUTOMATIC PIN CLUTCH

## HELPS SPEED 'CHANGE-OVER'

Easy adaptability protects nation now---  
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Owners of FERRACUTE PRESSES are now---and  
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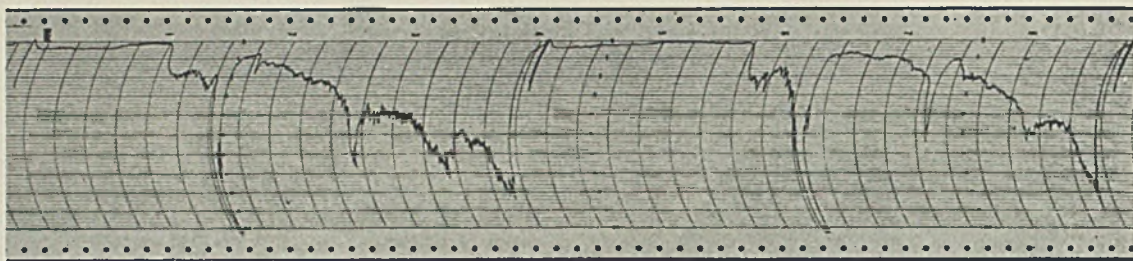
1. It can be adapted to compensate for extra heavy dies.
2. To allow time for various automatic attachments.
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TRADE  
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# The Converter's Place in War Production

By A. W. GREGG  
Executive Engineer  
Whiting Corp.  
Harvey, Ill.

Left, a converter in action. Above, chart from an electric-eye control showing various points in the "blow". From such a record, all portions of the action are easily identified. From an indicating instrument tied into this control, the progress of the operation can be watched and controlled closely

sulphur content in the finished steel to 0.03 per cent or less.

This control of sulphur content allows the use of a much wider range of raw materials in the original charge. The proportion of pig iron and scrap can be varied greatly, depending upon the availability or cost of the one as against the other. The charge may even consist of nearly all steel scrap plus a silicon-bearing alloy in amount necessary to supply the required percentage of silicon in the cupola metal.

No longer is the operation of the converter dependent upon the eye of the operator to control the operation with the greatest accuracy.

With the use of electric-eye control, operators can be trained in a comparatively short period to produce quality castings with a converter.

The general acute shortage of trained steel men makes this a most important advantage.

**Flexibility of operation** is a characteristic virtue of the converter process. It can be started up on short notice and operated for a few heats or throughout the day, according to requirements. Metal is delivered to the pouring floor often and in small quantities, which makes for economy of floor space in the molding department. To make large castings it is entirely practicable to

REPORTS indicate that present facilities are inadequate to supply the volume of steel castings needed for war production. To meet this situation, a number of castings manufacturers have installed or are considering installation of side-blow converters as a means of expanding the production facilities for steel castings. In the past five years, over 30 converters have been installed, most of them since 1940.

Perhaps the two most important factors responsible for the converter's comeback are the development of a practical means of reducing the sulphur content in the cupola metal; and the development of electric-eye apparatus to aid the converter

operator in controlling the operation more accurately.

Inability to reduce the sulphur content in the cupola charge was at one time a definite drawback to the converter process. It meant the use of low-sulphur pig iron and scrap to keep within the allowed sulphur content in the finished product. This resulted in the converter foundry's being unable to use its own gates and risers because of the sulphur buildup in the cupola. The introduction of the desulphurizing process for cupola metal removed the principal handicap of the converter. This treatment using alkalis in a receiving ladle is widely practiced today. It is now possible to hold the



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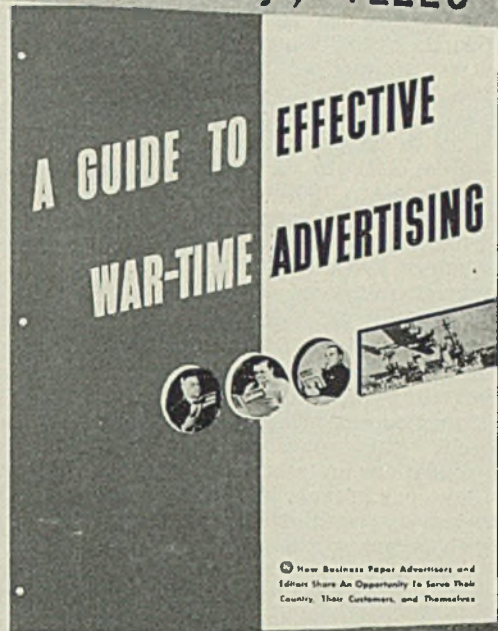
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combine several heats in one ladle.

A well known company in the Chicago area has been using side-blow converters for many years to produce all the steel castings used in its regular line of machinery products. At the same time, it has supplied many tons of castings for ordnance purposes, strictly within the limits for chemical composition and showing about the following physical properties: Tensile strength, 75,000 to 80,000 pounds per square inch; yield point, 42,000 to 48,000 pounds per square inch; elongation in 2 inches, 25 to 30 per cent; reduction of area, 42½ to 52½ per cent; cold bend, 140 to 180 degrees.

Incidentally, this company has never lost a blow of converter steel used for ordnance work for failure to meet either chemical or physical requirements.

Like other steelmaking processes, the converter depends upon oxidation for the refining operation. The five steps in this operation are: (1) melting cycle, (2) superheating cycle, (3) oxidation of metalloids to a very low percentage, (4) removal of excess oxides, and (5) adjustment with recarburizers to the required composition. In the converter this cycle is accomplished in 15 to 17 minutes. Also, oxidation in the converter is brought about by the oxygen in the air blast, while in other processes iron ore is used as the oxidizing agent.

For those who are not familiar with converter practice, it may be well to describe briefly the general outline of operation. The melting rate of the cupola should equal or

TABLE I—Data on Converter Operation

	Cupola		Ladle Change Per Cent	Converter	
	Cold Charge Into Cupola Per Cent	Hot Metal From Cupola Per Cent		Hot Iron to Converter Per Cent	Hot Steel from Converter Per Cent
Carbon .....	0.25 to 3.50	2.75 to 3.35	0	2.75 to 3.35	0.05
Sulphur .....	About 0.05	About 0.10	-0.07°	0.03	0.03
Manganese (Low side preferred) .....	0.60 to 0.70	0.50	0	0.50	0.05
Silicon <sup>1</sup> .....	1.75 to 2.25	1.50 to 2.00	0	1.50 to 2.00	0.05
Phosphorus .....	Not over 0.04	0.04	0	0.04 Max.	0.04

<sup>1</sup>Sulphur removed in ladle by treatment with alkalis.

<sup>2</sup>Temperature of steel controlled by percentage of silicon in metal charged.

slightly exceed the amount of metal desired for the converter charge. The purite or other alkali used for desulphurizing is put in the ladle before tapping hot iron from the cupola. By the time the ladle is filled, the desulphurizing slag is thickened by adding burnt lime.

The slag is then skimmed off completely. The desulphurized hot metal is now transferred by crane to the converter (in horizontal position) and poured into the nose. The converter for the first heat of the day should be preheated by an oil or gas flame so that the lining is about 2400 degrees Fahr. all through. The first heat usually takes about 20 minutes; succeeding heats average about 15 minutes.

The converter now is tilted back slowly to an upright position so that the metal is just at the lower level of the tuyeres. If in this position the vessel is less than 6 degrees from the vertical, more metal should be added; if more than 10 degrees some metal should be poured out.

It is very important to maintain a proper blowing angle, somewhere between 6 and 10 degrees.

The windbox is now closed and the air turned on. Elimination of the metalloids takes place in three stages: First is the silicon period, lasting about 5 minutes, during which most of the silicon is removed; then comes the boil, a period of violent reaction in which some carbon and most of the manganese is removed; and lastly, the carbon period in which most of the carbon is burned out. All of these stages have distinct flame characteristics, which enable the operator to know when the endpoint has been reached.

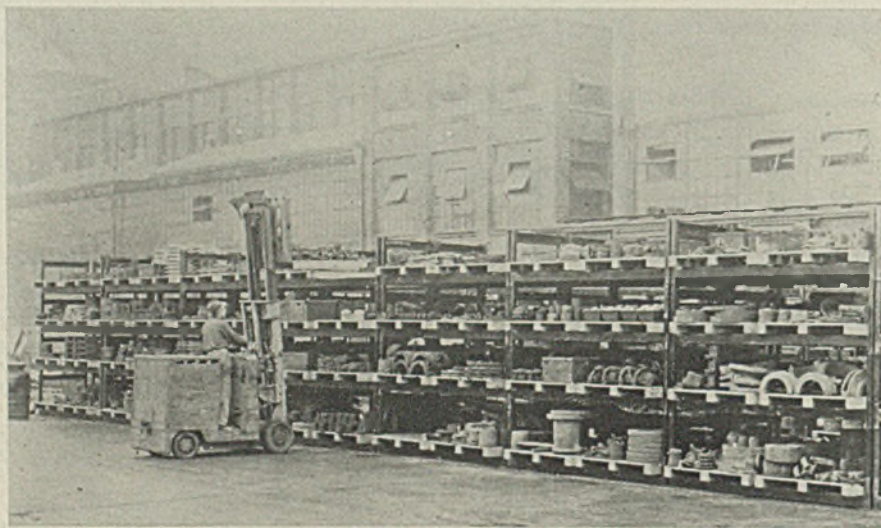
Today the electric eye automatically plots a curve, registering the intensity of the flame and the endpoint of the operation is registered exactly on the chart in the operator's pulpit. This instrument is a great aid in training an operator. Also the apparatus will catch the endpoint more accurately than is possible with the human eye.

The end of the blow is marked by dropping of the white flame and just a trace of brown smoke, at which point the vessel must be turned down and the air turned off. At this time carbon content is about 0.05 per cent and manganese and silicon are about 0.10 per cent. This brings us to the fifth or final stage—recarburizing. Ferromanganese and hot cupola metal are added in the vessel in amounts sufficient to bring the manganese and carbon contents to desired percentage. Ferrosilicon is likewise used to bring up the silicon to desired percentage. Ferrosilicon usually is placed in the ladle and the steel poured over it. A small amount of aluminum—about 1 pound to a ton of steel—is usually a desirable addition.

There is no set analysis as regards carbon and silicon for the materials that make up the cupola charge. As shown in the accompanying table, carbon may vary from 0.25 to 3.50 per cent, silicon from 1.75 to 2.25 per cent and manganese from 0.60 to 0.70 per cent. All three of these elements are eliminated during the blow. That is, they are reduced by oxidation of the blast and replaced

(Please turn to Page 125)

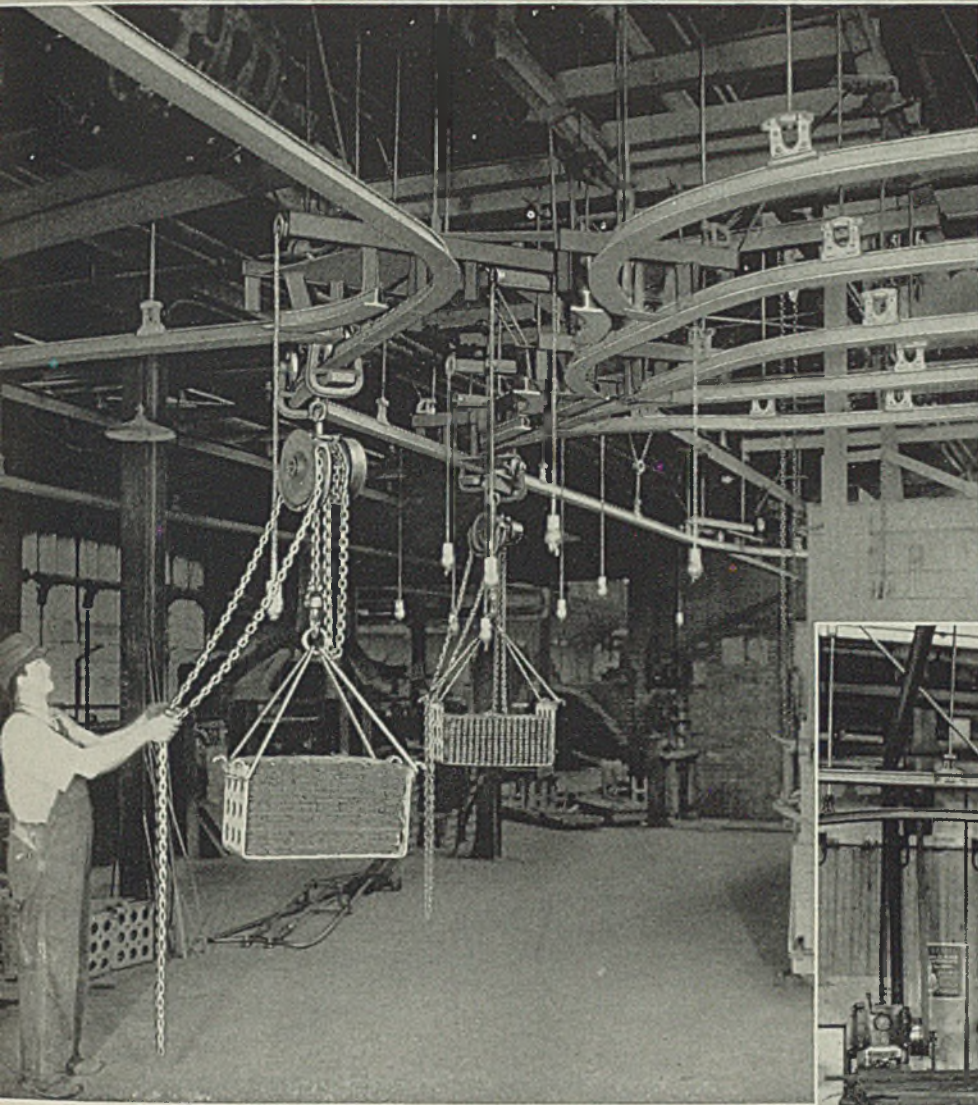
## Making Storage Areas "Pay"



BESIDES RELIEVING yard storage areas, storing of turbine parts in pallet handling racks at one of General Electric's shops facilitates classification and delivery of pieces, reduces handling costs and simplifies inventories. Incoming materials are classified, put on pallets for unit operations in the shop; then stored in these racks until needed on the production line, when direct-to-job delivery is made by a fork truck. Racks can be rearranged without disturbing any of the materials

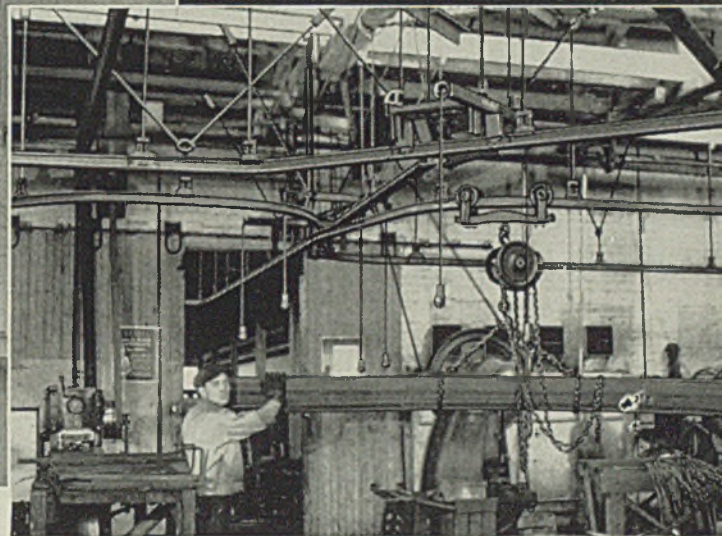


# POINT TO POINT TRANSPORTATION ELIMINATES IN-BETWEEN HANDLING



*Saves  
time!  
Cuts costs!*

Materials are delivered  
directly on overhead  
rail system



With a Cleveland Tramrail overhead materials handling system the three usual steps involved in materials handling — pick-up, convey, set-down — are reduced to one simple operation. Thus two costly steps of in-between handling are eliminated.

Materials are delivered direct from point to point with easy rolling carriers on smooth overhead rails.

There is no stopping and waiting as transportation is overhead, away from floor traffic and congestion.

Cleveland Tramrail equipment has been developed to handle nearly every conceivable kind of material. Whether you are interested in an inexpensive chain hoist and carrier, or a plant-wide electrified system, Cleveland Tramrail engineers can aid you.

*GET THIS BOOK!*



**CLEVELAND TRAMRAIL DIVISION**

THE CLEVELAND CRANE & ENGINEERING CO.

1125 EAST 283RD ST.

WICKLIFFE, OHIO.

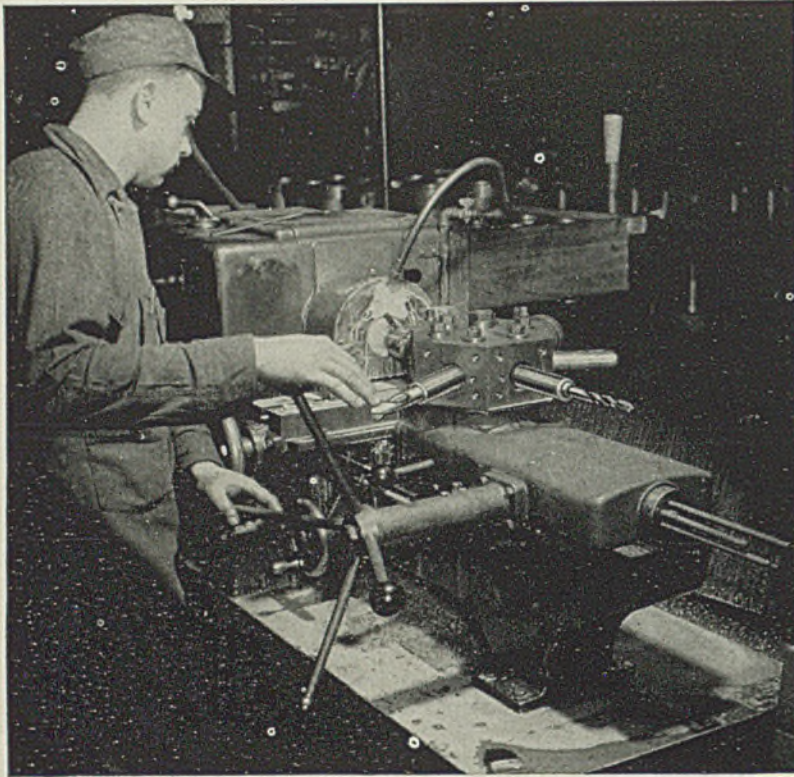
MANUFACTURERS OF • CLEVELAND CRANES • CLEVELAND TRAMRAIL • STEELWELD BENDING PRESS

**CLEVELAND**  **TRAMRAIL**

**OVERHEAD MATERIALS HANDLING EQUIPMENT**

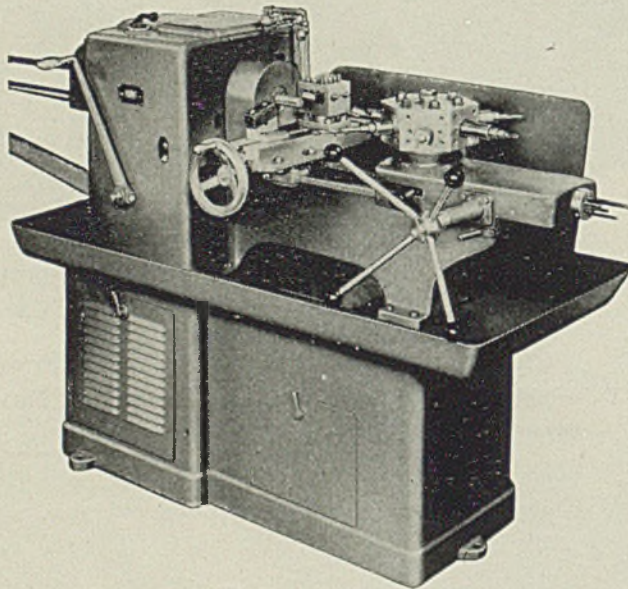
BOOKLET No. 2008 . . Packed with valuable information. Profusely illustrated. Write for free copy on your company letterhead.





The Oster No. 601 SIMPLIFIED Turret Lathe meets today's urgent needs for a low cost, motor driven bar and chucking machine for a wide range of small diameter jobs not requiring complicated, costly equipment or highly skilled set-up men and operators.

For complete details, fill out form below and mail. A copy of illustrated Catalog No. 27-A will be sent to you promptly.



**THE OSTER MFG. CO. • 2037 East 61st St., Cleveland, Ohio**

Rush, by return mail ..... copies of Catalog No. 27-A which contains full description and detailed illustrations of No. 601 Turret Lathe.

NAME .....

ADDRESS .....

CITY..... STATE.....

# SIX IMPORTANT ADVANTAGES GAINED WITH



## No. 601 SIMPLIFIED TURRET LATHE

**1** Release your more complicated, costlier machines for other work. The Oster No. 601 Turret Lathe has proved its efficiency on a wide variety of bar and chucking operations in the small diameter range up to 1½-inch.

**2** Release your highly skilled set-up men and operators for work demanding their expert services. The Oster No. 601 Turret Lathe has hand feed to cross slide and manually operated, six station turret.

**3** Speed up training of new operators. The simplified design and operation of the Oster No. 601 Turret Lathe saves months in training new men to high standards of efficiency.

**4** Maintain flexibility for quick change-overs from job to job. For example, a battery of six Oster No. 601 Turret Lathes permits using all six machines on identical work, or, at any time, releasing one or more of the six machines for different work.

**5** Obtain quicker deliveries of Oster No. 601 Turret Lathes and eliminate costly delays waiting for shipments of more complicated machines which you may need now but can't get for months to come.

**6** Save money on initial investment in machinery. The Oster No. 601 Turret Lathe equipped with optional *worm drive* or *direct drive* and *six station turret* costs less than \$2000 without tools and fixtures.



## Conversion

(Continued from Page 83)

every ten which drop off this machine—within a few seconds after the parts drop off.

The result is that if a tool slips, gets dull or if for any other reason faulty parts begin to drop off, this is detected immediately and the machine is reset or the tools resharpener or replaced. Otherwise, hundreds or even thousands of "scrap parts" would be produced before the error could be detected. The fact that many of these parts are made of scarce materials, makes this waste elimination doubly important.

This same "close-up" inspection is used in connection with second operation and bench work in which the human element is involved much more than is the case with automatics. An interesting point in this connection is that much of the work on which minor faults are detected by the inspectors is simply passed back to the operators for correction. For instance, if it is a cross drilling and burring operation and the burring is not complete, the inspector simply hands it back to the operator for reburring. This instantly "jolts" the operator into being more careful and at the same time salvages a part which might otherwise land on the scrap pile if it went on to the assembly department with its shortcomings undetected. This is emphasized by Figs. 2 and 4.

In line with policy of keeping tooling as simple as possible, gages used by the inspectors are for the most part "home made" devices which are ingenious because of their simplicity. This does not imply that they are "makeshifts" in any sense of the word. It simply means that unnecessary refinements, either in design or in degree of accuracy, are studiously

avoided. For instance, if a simple snap gage cut from steel plate, nonadjustable, and accurate to plus and minus 0.001-inch, is good enough, an elaborate adjustable gage accurate to plus and minus 0.0001-inch is not used.

These days not one minute of tool engineering talent and tool making skill should be wasted. There is hardly enough to go around. Furthermore, there is no sense in confusing the minds and hands of persons of limited skill with complicated tools and instruments which even in the hands of the highly skilled would be of no advantage on the job involved. Gages of extreme precision have their place and they should be reserved for the work which only they can perform. Being scarce and hard to get, their unwarranted use is equivalent to abuse.

The same is true of machine tools of large capacity or extreme precision—especially those classified as "critical" machines. Among these must be included horizontal boring, drilling and milling machines and heavy duty radial drills. Inasmuch as there are many important jobs which only these machines can handle, production engineers of the business machine company see to it that minor jobs are kept away from these critical machines. Furthermore, they see to it that these critical machines at all times are kept busy doing "critical" work—either through proper scheduling of the company's own production or through solicitation of contracts or subcontracts which will make good use of them.

These days one must look with a critical eye upon such performances as "drilling 6-inch parts on a 6-foot radial or boring 5-pound bearing brackets in a 15,000 pound boring machine". The time will come when such misapplied machines will be commandeered. That

time may be close at hand.

Effective use of all available machine tool equipment, whether critical or not, is the order of the day in this Ohio business machine plant. This includes rehabilitation of older machines, many of which are belt-driven. In ordinary times these machines undoubtedly would be demoted to inconsequential jobs or scrapped in favor of the latest models. Now, however, such a policy is not in keeping with the conservation of productive capacity which is so vitally necessary to bring about successful conclusion

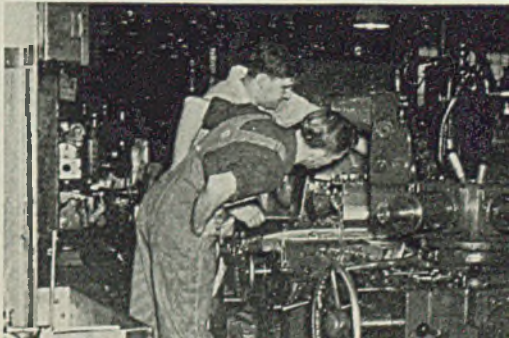
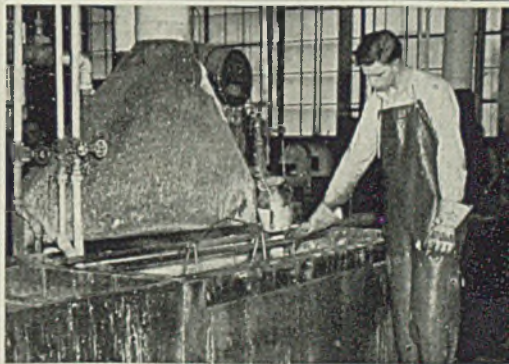


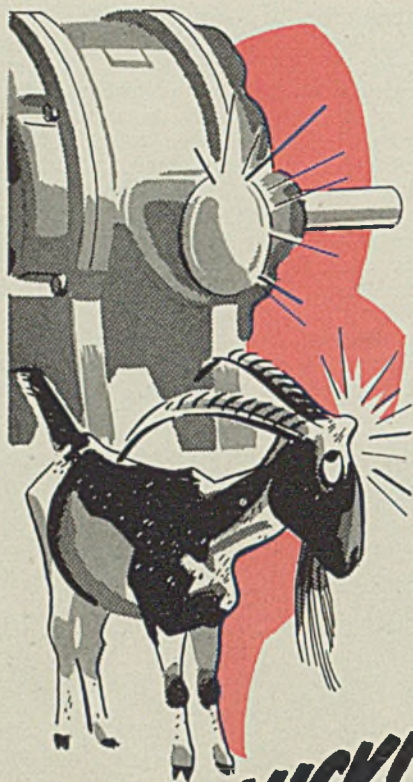
Fig. 6—No major repairs ever are made to overhead countershafts. Whenever a countershaft outlives its usefulness, or whenever it is necessary to locate older belt driven machines away from existing line shafting, standard conversion attachments are applied, thus providing independent motor drive and in many cases increasing production considerably

Fig. 7—Good plant housekeeping—important under any conditions—is doubly important now that such tremendous volume of work is in process and so many new workers are on the job. By keeping everlastingly at it to see that there is a place for everything and that everything is in its place, the maintenance crew encourages a spirit of orderly precision which inspires workers to do their best in quality and quantity of output

Fig. 8—A phase of plant housekeeping is removal of gases, smoke and fumes from departments wherein heat treating, cleaning and finishing are carried on. Suction hoods such as those shown on the vats in this picture make working conditions healthful and comfortable, thus reducing labor turnover and resulting in more and better work

Fig. 9—"Learning by watching"—In this case the operation of a heavy duty turret lathe—is hastened by teaming up likely beginners with experienced workmen who are thoroughly sympathetic with this important phase of the "Training Within Industry" program





**NOT A NICK!**

**NO DAMAGE DONE WHEN  
WESTINGHOUSE  
CS MOTORS GET KNOCKED  
AROUND, EITHER!**

**THEY'RE**

**YEARS  
AHEAD**

**WITH RIGID-  
ONE-PIECE FRAMES  
THAT PROTECT INTERNAL  
PARTS LIKE A SAFE!**

J-21237



**SEE PAGE 20  
AND PAGE 21**

of our all-out production drive.

Where these belt drive machines can be driven from existing line shafting through existing countershafts, this is done. However, no line shafting is erected, nor are any major repairs ever made to countershafts. Whenever belt driven machines must be used away from the line shafting, or whenever extensive repairs become necessary in order to keep the countershaft in action, the belt driven machine is immediately converted to unit motor drive.

This is done through application of a commercial conversion unit, bracket-mounted on the machine—drive being through a short center belt to the standard cone on the machine. These units are shown in action in Fig. 6. Thus the simplicity of the cone head is retained, with added advantages of push button control, flexibility in location of the machine, better overhead lighting conditions, reduced maintenance cost and in many cases increased production.

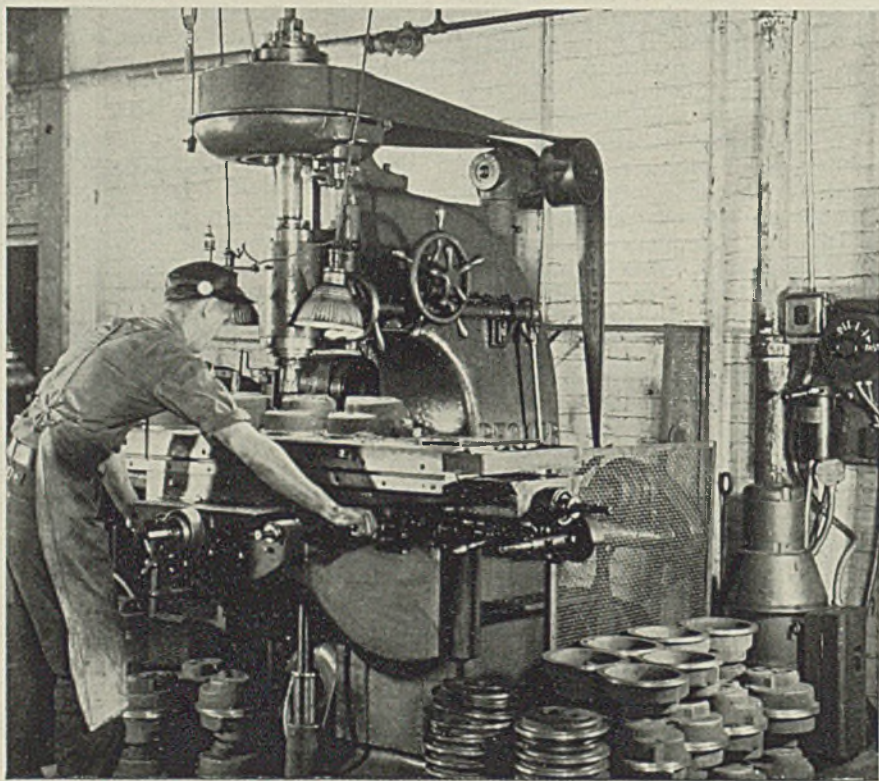
This brings up the subject of maintenance, including millwright work. In many a plant an insidi-

ous variety of overhead has grown up undetected, in the form of an over grown and over-equipped maintenance crew. The tendency is for such a crew and its equipment to grow to proportions capable of handling maximal jobs of machinery moving, setting, etc., when as a matter of fact such maximal jobs don't happen along very often. The result is that there is altogether too much "made work" or even downright loafing on the part of this overdeveloped maintenance department.

This situation is avoided completely in the plant which is the subject of this article, by allowing only a minimum maintenance crew, outside specialists with their own special equipment being hired in whenever a major millwright job arises. These specialists and their equipment are furnished by organizations whose business is moving and erecting industrial equipment of all kinds. Like piano movers, they know exactly how to juggle heavy objects around. They come quickly on call, get the work done with neatness and dispatch, and

(Please turn to Page 126)

### Rejuvenated Oldster Helps Beat the Axis



EVERYTHING GOES in war—even to the extent of rebuilding old machine tools—a thing that just isn't done ordinarily—to obtain utmost production. This old boy above, an old Becker vertical miller was purchased and rebuilt by Continental Machines Inc., Minneapolis. New life was injected through medium of a new Reliance Electric all electric, adjustable speed drive. Now the performance of the miller is considerably better than when it was new, it is claimed. It is handling heavy operations at a faster pace and with greater flexibility. Five speeds are regularly in use on the machine with an indefinite number in reserve



# METALWORKING MAMMOTH HELPS SHIP PROGRAM

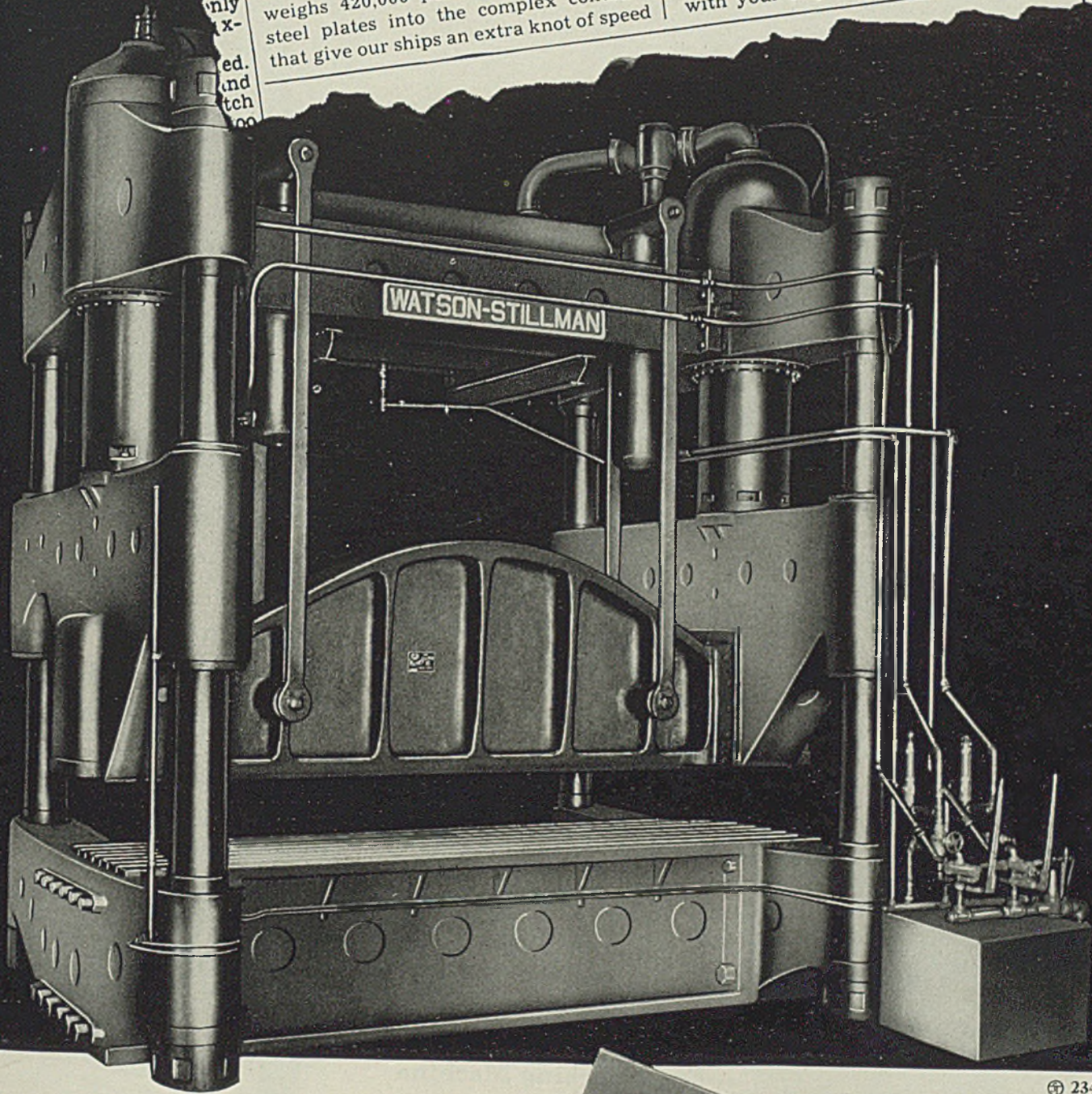
America and England continue to hold mastery of the high seas—but largely because enterprising U. S. shipyards are working far ahead of schedule. Machines like that shown below help them get the jump on time and Adolf Hitler.

This 1500-ton-capacity Watson-Stillman Keel Plate Bending Machine is 23 feet long, 18 feet wide, 29 feet high, and weighs 420,000 pounds. It bends thick steel plates into the complex contours that give our ships an extra knot of speed

or save an extra barrel of precious fuel. Main rams are 36 inches in diameter, the platen 6 feet by 22 feet. Its die bolster is 22 feet long and 1 foot, 10 inches wide. Its beam has a 4-foot stroke.

This giant press is but one result of 95 years of W-S experience in designing and building hydraulic machinery. Other results of W-S experience, facilities and skill may meet your needs.

Now is the best time to acquaint us with your requirements.



## FREE! Hydraulic Handbook

Bulletin 120-A—12-page hydraulic engineer's handbook—is yours for the asking. Capacities of Hydraulic Rams; Orifice Discharge of Water; Seamless Pipe Properties; Strengths of Materials; etc., etc. No advertising. Write The Watson-Stillman Co., Roselle, N. J.



# WATSON STILLMAN

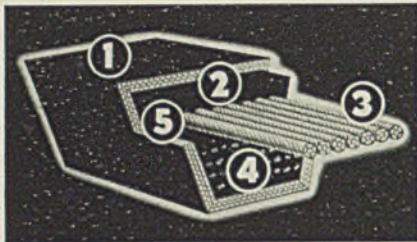
Engineers and Manufacturers of Hydraulic Machinery and Equipment—Hydraulic Presses, Pumps and Jacks, Forged Steel Valves and Fittings



# Industrial Equipment

## Improved V-Belt

Goodyear Tire & Rubber Co., Akron, O., announces a new black E-C cord multi-V belt which is said to provide longer wear, more uniform pull and higher resistance to



heat, oil and other enemies of long belt life. The more uniform pull and better balanced performance results from the fact that it is possible to build this black cover with more consistent coefficient of friction. In addition, the cord construction concentrates the load-carrying cords in the neutral axis where all pull evenly, without uneven stresses. V-belts are being offered in all standard cross-sections and lengths, and in sets.

## Weight-Printing Scale

Toledo Scale Co., Toledo, O., is offering a new Printweigh scale which integrates its printing operation with the weighing operation. In this unit the printing wheel is



a direct part of the scale—revolving on the same ball-bearing shaft as the scale indicator hand, responding to scale loads in the same manner as the automatic dial scale. This

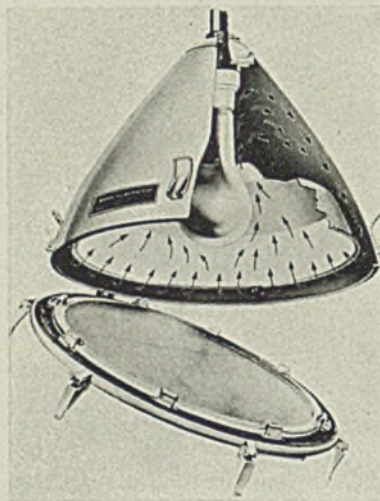
one feature, it is said, is invaluable where materials are weighed on the move, in split-second batching operations. The scale offers a wide range of printed weight records for all purposes. Records may be made in weight sheet or ticket form, continuous roll strips, or a combination of these with single or duplicate copies.

## Welding Torch

Weldit Acetylene Co., 638 Bagley street, Detroit, has introduced a new featherweight welding torch especially suited for aircraft and sheet metal welding. It weighs only 9 ounces and measures 11½ inches in length.

## Floodlight

Revere Electric Mfg. Co., 2949 North Paulina street, Chicago, announces a new cool-operating floodlight for use where explosive dust is prevalent. The outer housing of the floodlight is designed so that dust cannot accumulate at any point. Strong cast lens ring has eccentric locking clips exerting equal pressure against an impregnated

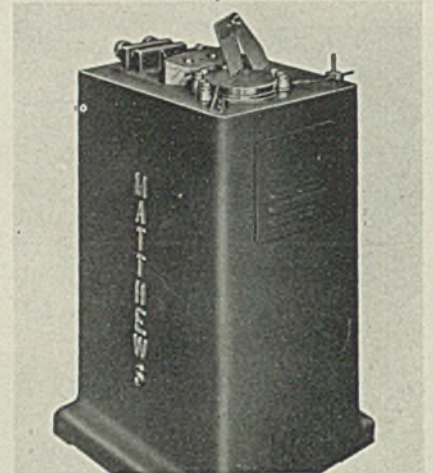


asbestos gasket which holds lens ring tightly against housing. Interior of floodlight is designed for cool operation. As may be seen in the illustration, the inner reflector allows space between the lamp and the housing which creates convecting air currents which circulate the air inside the unit, dissipating heat generated by the lamp. The floodlight is available in 75-100 and 150-200 watt sizes for ½ or ¾-inch conduit mounting.

## Fuze Marking Machine

Jas. H. Matthews & Co., 3942 Forbes street, Pittsburgh, announces No. 201 fuze marking machine for marking the outside surface of the fuze body or part with a stamped impression. Fuze bodies,

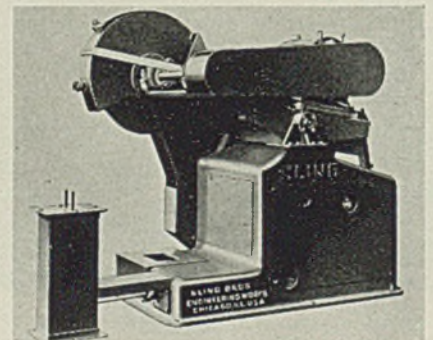
parts or round pieces to be marked are fed by hand from the right side of this machine up to its continuous rotating pressure dial table. Parts are carried around on the pressure dial table between the die holder. Under marking



pressure, the part being marked rotates against the pressure dial to complete the marking. The marked piece on the opposite side of the machine is removed by an ejecting plate which sweeps the part off the dial as it continues the cycle. The pressure dial on the flat bed of the machine is finished to match contour of the piece to be marked. This dial can be removed and other dials of different size and shape assembled. Type holders are concave in shape corresponding to the marking diameter of pressure dial, plus diameter of part to be marked. They also are shaped accordingly to match vertical contour on conical parts to be marked.

## Friction Saws

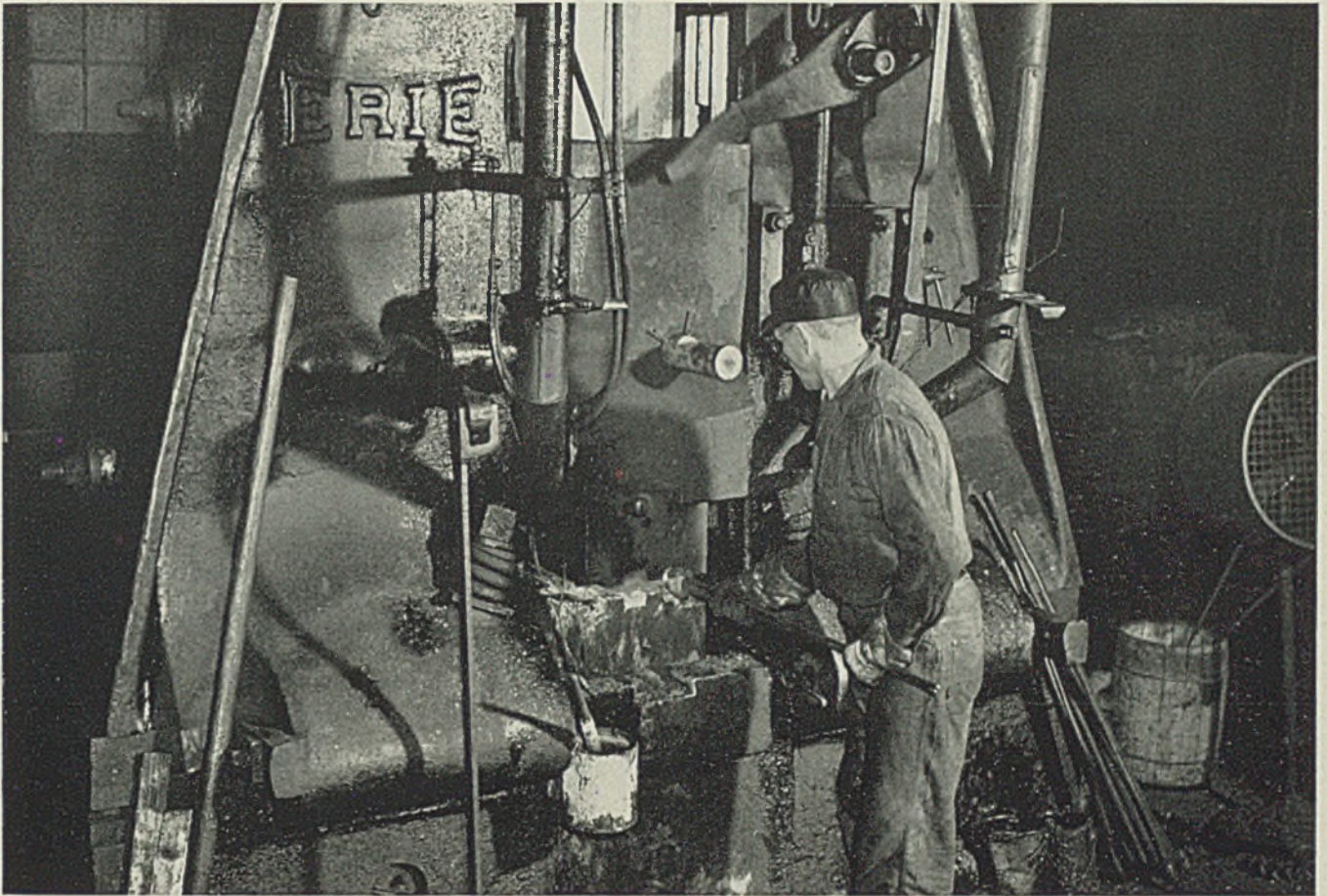
Kling Bros. Engineering Works, 1300 North Kostner avenue, Chicago, announces a new 36 and a 48-inch downstroke friction saw for cutting solid, hollow, hot or cold steel stock. Both feature hydraulic feed and motor sizes of



40 to 75 horsepower. Swing frame of each is actuated by means of a double-acting hydraulic cylinder through a 1½-horsepower motor and pump which delivers oil at



# Proving their Mettle . . .



## . . . improving Metal

The entire facilities of Erie Foundry are operating at capacity, building Steam and Board Drop Hammers so that an ample supply of essential forgings can be produced for our war efforts.

These days, Erie Steam and Board Drop Hammers are operating longer hours than ever, working metal into tough, strong, useful forgings. Under such abnormal production conditions, these hammers are proving their real mettle by answering the demand for "more forgings—faster."

The records of Erie Hammer dependability that are being made today will serve as excellent purchasing guides in the future when normal times return.

### ERIE FOUNDRY COMPANY ERIE, PENNSYLVANIA, U.S.A.

DETROIT 338 Curtis Bldg.	CHICAGO 549 Washington Blvd.	INDIANAPOLIS 338 Postal Station Bldg.
AUSTRALIA Associated Machine Tools	CANADA John Bertram & Sons Co. Ltd.	ENGLAND Buxton, Griffiths & Co., Ltd.

# ERIE

## BUILDS Dependable HAMMERS





EASY AS ROLLING OFF A LOG...  
 BETTER... FASTER ASSEMBLY  
 JOBS WITH PHILLIPS SCREWS

"AND DON'T FORGET!  
 PHILLIPS SCREWS COST LESS TO USE!"

## One Hand Driving • Power Tools • Tighter Assembly = 50% Less Assembly Time with Phillips Screws

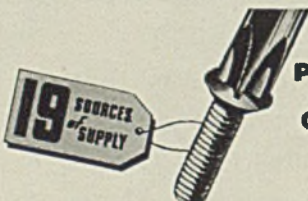
**B. P.** (Before Phillips). Slow-driving slotted screws required two hands to aim the screw and steady the work — and still accidents happened, causing plenty of mangled fingers or scars in the work. Always something going wrong — crooked screws — heads splitting — burrs to remove — loose assemblies. Thank goodness those days are gone forever!

**A. P.** (After Phillips). Faster-driving Phillips Recessed Head Screws need only one hand . . . the other hand is free for support. No fumbled screws — straight, effort-

less driving. Even when assembling parts already finished — like enameled, painted or other easily-scratched surfaces — power driving is safe, because there's no danger of driver slippage. And screws can be set up tight without heads splitting or raising burrs.

Your assembly crew will find it "easy as rolling off a log" to produce better work . . . in half the time . . . at a 50% cost saving with Phillips Screws.

*For facts and screws write any firm listed below.*



**PHILLIPS RECESSED HEAD SCREWS**

**GIVE YOU** *2 for 1* (SPEED AT LOWER COST)

WOOD SCREWS • MACHINE SCREWS • SHEET METAL SCREWS • STOVE BOLTS • SPECIAL THREAD-CUTTING SCREWS  
 • SCREWS WITH LOCK WASHERS

American Screw Co., Providence, R. I.  
 The Bristol Co., Waterbury, Conn.  
 Central Screw Co., Chicago, Ill.  
 Chandler Products Corp., Cleveland, Ohio  
 Continental Screw Co., New Bedford, Mass.  
 The Corbin Screw Corp., New Britain, Conn.  
 International Screw Co., Detroit, Mich.  
 The Lamson & Sessions Co., Cleveland, Ohio  
 The National Screw & Mfg. Co., Cleveland, Ohio

New England Screw Co., Keene, N.H.  
 The Charles Parker Co., Meriden, Conn.  
 Parker-Kalon Corp., New York, N.Y.  
 Pawtucket Screw Co., Pawtucket, R.I.  
 Phool Manufacturing Co., Chicago, Ill.  
 Russell, Burdissall & Ward Bolt & Nut Co., Port Chester, N.Y.  
 Scovill Manufacturing Co., Waterbury, Conn.  
 Shakeproof Inc., Chicago, Ill.  
 The Southington Hardware Mfg. Co., Southington, Conn.  
 Whitney Screw Corp., Nashua, N.H.

constant pressure during the cut, and at low pressure while idling in between cuts. Operating pressure is adjustable to provide desired operating load on the main motor which remains uniform during the entire cut. The rate of downstroke of the saw blade is adjustable up to 2.8 inches per second while the upstroke is fixed at 4.35 inches per second. The saw blade is shielded with a fabricated hood, a cooling system being provided for directing the water to dissipate heat from the blade rim. Water and operating controls are located in the pedestal control stand in front of the saw to allow clear view of all operations. Finish pads also are provided for receiving suitable holding fixtures for the work.

### Handguard

Industrial Gloves Co., Danville, Ill., has introduced a new Steel-Grip No. 13914 handguard for grinders. Said to be long wearing and comfortable, it is made of tough chrome tanned cowhide, reinforced on the back where the wear comes, with



extra patch of steel reinforced leather. Of the mitten-type, the guard is open at the end to allow free use of fingers in picking up parts or tools. It is built to be worn over a glove or mitten, and is offered in pairs, all lefts, all rights, or any combination of lefts or rights.

### Autotransformers

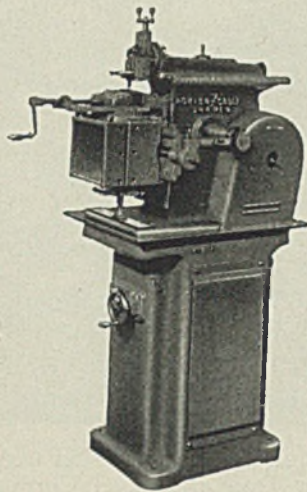
General Electric Co., Schenectady, N. Y., announces a line of variable-voltage autotransformers to control uninterrupted voltage and small amounts of power. Although small and light in weight, these units are particularly suited for use in factories and laboratories. They are designed for panel and bench mounting. Each unit operates on low power and low exciting current. The input circuit is connected to a winding made up



of spaced turns of the round conductor, thoroughly insulated. Connection to the output circuit is provided by a carbon brush. By changing position of the brush, the output voltage can be varied uniformly without interrupting the load current. The dial on the cover is calibrated to indicate from 0 to 100 per cent of maximum output voltage.

### Metal Shaper

Porter-Cable Machine Co., Syracuse, N. Y., is introducing a new 7-inch metal shaper—a self-contained motor-driven unit with motor and



speed change control mounted in the floor pedestal. The machine, according to the company, is in production for delivery in about 30 days. Its length of ram travel is 7 $\frac{3}{4}$  inches, and operates at any speed from 64 to 175 strokes per minute. The 4-inch diameter tool head of the unit swivels 360 degrees and travels 2 $\frac{3}{4}$  inches. Machine table measures 8 x 8 x 7 $\frac{1}{2}$  inches, and features a traverse of 10 $\frac{1}{2}$  inches and vertical travel of 5 $\frac{1}{2}$  inches. Its adjustment is by means of a handwheel. Six cross feeds are embodied in the unit. Inclusion of tapered pins for quickly locating head and vise, and micro set ram for quick "set up" are some of the features that facilitate operation of shaper. The unit is powered by a standard  $\frac{1}{2}$ -horsepower motor.

### Power Pack

Physicists Research Co., 343 South Main street, Ann Arbor, Mich., announces a new accessory, Power Pack, unit which enables profilometers to be powered from 115-volt 50-60 cycle alternating current lines. Increasing need for uninterrupted use in one location, particularly on 3-shift inspection operations, made it necessary to develop such an accessory, according to the company. Furthermore, profilometers having



**American Chain**  
**MUSCLES OF STEEL FOR**  
**EFFICIENT PRODUCTION**

★ Men get *more jobs done better* with American Chain which multiplies muscle power and helps spur production from peace-time routine to war-time peak levels. ★ Since war conditions prevent immediate shipment of some types and sizes of American Chain we suggest you plan to get the most work out of every foot of chain you now have. ★ Consult your mill supply distributor on how to *select, apply, use, inspect and maintain* your chain. He will help you make your present chain last longer. And you may be sure he will ship your orders for American Chain as fast as his inventories permit.

**AMERICAN CHAIN DIVISION**  
 York, Pa., Boston, Chicago, Denver, Detroit, Los Angeles,  
 New York, Philadelphia, Pittsburgh, San Francisco

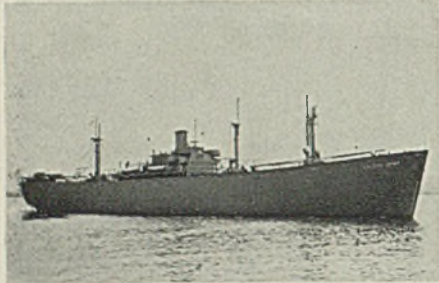


**AMERICAN CHAIN & CABLE COMPANY, Inc.**  
 BRIDGEPORT • CONNECTICUT



## Liberty Ships on Schedule

■ Shipyards from Bath and Norfolk to Seattle are concentrating on building Uncle Sam's new merchant marine . . . a bridge of Victory supply ships 'round the world . . . a ship program destined to be the largest and most quickly constructed in the world. Now geared to a speed of two ships per day, the future holds a goal of three a day . . . thanks to the efficient use of readily available, familiar methods and materials.



When the rush orders came, many shipbuilders turned at once to the customary riveted and bolted construction they had known and used so long. This standard method of fastening was quickly and easily taught to "green" hands who were pressed into service by the rapid expansion of shipbuilding.

Made to modern accuracy standards and more efficient than ever, Oliver Marine Rivets, even in briefly trained hands, proved a ready match for the speed and dependability demands of the Liberty Ship Program . . . their finless shanks and accurate lengths assured speed and solid fastening. Oliver Commercial Bolts, too, performed hundreds of vital tasks from fitting-up to forming staunch, permanent connections. For special requirements, Oliver High Tensile Bolts, Galvanized Deck Bolts and special purpose fasteners installed quickly on hundreds of vital applications. Boiler room high pressures and high temperatures were met with the extra-dependability of Oliver Alloy Studs.

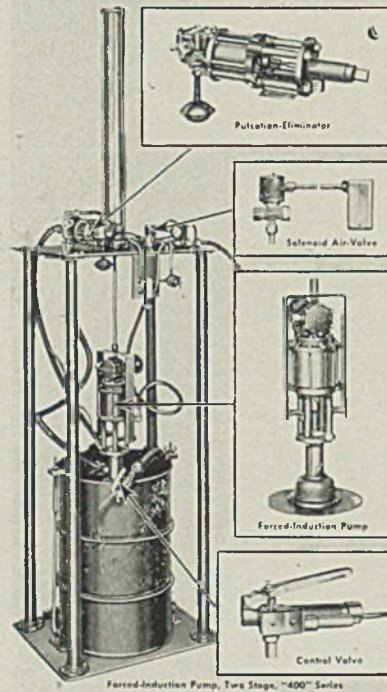
All these vital tasks, Oliver Steel Fastenings are doing to help assure America's Bridge of Ships . . . these and many more they can do in your industry if it is essential. Here still is latent steel fastener capacity for Victory Industries . . . call on Oliver.



a serial number of 75 or greater may be returned to the plant converted for alternating-current operation by the installation of the new development.

## Forced-Induction Pumps

Lincoln Engineering Co., 5701 Natural Bridge avenue, St. Louis, has placed on the market new forced-induction pumps known as Pile Drivers. These are designed to dispense heavy, viscous materials such as sealing compounds, sound deadeners, insulating materials, putty, heavy lubricants and other substances. The pumps will deliver certain materials direct from the original containers without the use of heat to make the materials soft and pliable enough to be pumped. They are being offered in single or 2-stage models, both employing one



air-motor. Units are furnished in sizes for pumping materials from containers up to 10-gallon (100-pound) capacity, and for pumping material from 55-gallon (400-pound) drums. The single-stage unit is for use where pulsation in the flow of material is permissible. The 2-stage unit has a pulsation eliminator and delivers the extruded material at an even rate of flow and in uniform size and shape as desired. Delivery of materials in both models is controlled by a hand operated shut-off valve at the outlet.

## High-strength Clamp

Products Engineering Co., 416 South Robinson boulevard, Los Angeles, announces a new high-strength C clamp having a breaking point of

## The Women Watch . . . Not Wait

■ Old wives' tales of many wars ago tell of the women who watched and waited for their warriors' return. Not so today . . . over 500,000 women are engaged in *active* war production jobs . . . estimates indicate that later 2 million women will bolster essential industries replacing men in the service.

Today our working women *watch* . . . but *do not wait*, for they are filling an important responsibility in material and product inspection, assembly work, machine operation



and hundreds of precision tasks. At Oliver Iron and Steel Corporation alone over 200 women do a man-sized job of threading, pointing, inspecting, sorting and packing Oliver Bolts, Nuts, Rivets and Steel Fasteners of all types for hundreds of applications in armament and essential industries.

Part of the dependability, accuracy and precision which you can always recognize in Oliver products is directly attributable to the skill and dexterity of these women. Into every Oliver product goes something more than just the demands of your specification . . . there's pride and workman-like skill, proved design that's checked with your ultimate uses and the experience and "know-how" of many years.

We, at Oliver Iron and Steel Corporation have learned how to cut a lot of production snags and get needed material delivered for vital applications. Why not check your steel fastening needs with us today?

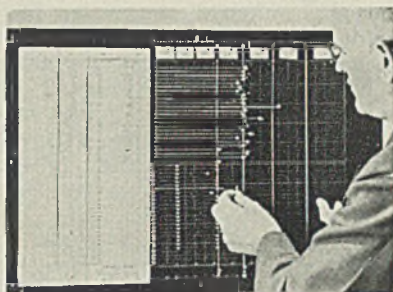




7800 pounds. Developed particularly for the United States Air Forces, it is offered immediately in the 1¼-inch size. Clamping strength of the unit is achieved by a 100 per cent drop-forged manufacturing process. The clamp features a square-head type screw.

### Production Control

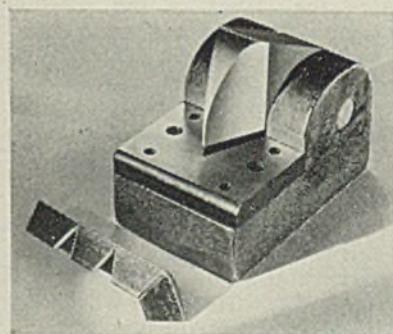
Wassell Organization, Westport, Conn., has placed on the market a Produc-Trol—a unit especially suited in plants maintaining multiple-shift production which enables production and purchasing executives to see quickly all facts concerning raw materials, parts, assemblies, machine



and man hours. The device lists parts, assemblies, subassemblies, or individual operations on a part, at the left of the board. Movable tapes working from left to right on pulleys bring all pertinent facts into instant focus. Double rows of peg holes under the movable tapes of the unit, and various colored pegs, permit many arrangements of comparative data and control, required for any operation.

### Notching Dies

Strippit Corp., 1200 Niagara street, Buffalo, N. Y., announces a new line of Notching dies designed to notch 11-gage angle iron right up to the leg. Each of these is self-contained with the punch and die in constant alignment. Nothing is



attached to the ram of the press. Lining up several dies on a T-slotted plate will affect a complete notching pattern in one stroke of the press, according to the company. Notching dies are offered to notch a complete variation of angle sizes.

# ROEBLING *Wires*

## ROUND . . . FLAT . . . SHAPED

A FEW WIRES TYPICAL  
OF ROEBLING'S BROAD  
SPECIALTY PRODUCTION

MADE TO YOUR  
SPECIFICATIONS  
TO SPEED  
OFFENSE  
PRODUCTION



Looking for ways to increase production . . . speed up deliveries? Do these round, flat or shaped wires suggest a short-cut to your Victory Program? You can save man-and-machine hours by having Roebling supply the right wires . . . made to exacting specifications of steel analysis, dimensions and finish . . . on schedule!

Trained along custom production lines, with the experience and facilities to tackle the tasks involved, Roebling has built a reputation solving problems in specialty wires.



**JOHN A. ROEBLING'S SONS COMPANY**

TRENTON, NEW JERSEY • Branches and Warehouses in Principal Cities



## Weigh-Counting

(Concluded from Page 101)

bins at counter height, and the counting scale was bolted to a carriage supported by ball-bearing shieve wheels so the scale can be rolled from end to end of the aisle without danger of upsetting.

The Z-bar is a standard section  $1\frac{1}{4} \times 1\frac{3}{4} \times 2\frac{1}{2} \times 7/32$ -inch weighing  $3\frac{1}{2}$  pounds per foot and handled in 20-foot lengths. It is clamped to the front supports of the steel bins and carefully leveled from end to end and also cross-wise of the aisle so the scale will always give accu-

rate zero readings at every point. Then the Z-bar and the bin are drilled together, the holes reamed and tight fitting bolts used to mount the z-bar to the bin structure.

The carriage consists of  $\frac{3}{8}$ -inch flat boiler plate reinforced at each end by angle irons running parallel with the tracks. The projecting webs of the angle irons are drilled to carry the axles for the shieve wheels. As can be seen in Fig. 2, these axles are in two pieces which telescope within each other and thus permit the wheels to accommodate themselves to slight irregularities in the distance between the

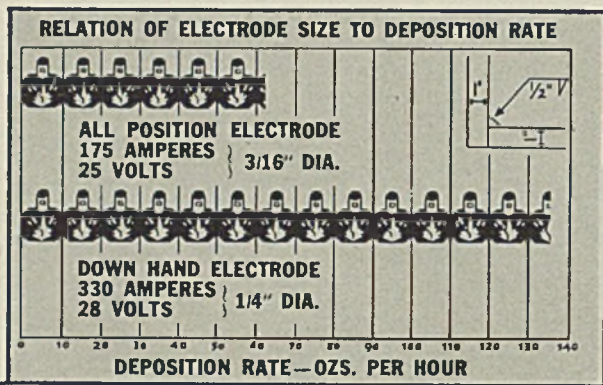
bins. They also permit the transfer of a scale from an aisle of one width to a wider or narrower aisle without dismantling it.

With this new setup, the operator, armed with his schedule of material to be withdrawn for the assembly line, pushes a conventional A & P wheeled gathering cart down the aisle to the various bins, at the same time rolling the scale ahead of him to the same bins. He weighs out the parts required and deposits them in the pans on the gathering cart, returns the overage to the bin.

This system not only saves the hour's constitutional per aisle for the stock clerk, but the small overages that often become the thirteenth in the baker's dozen and are generally wasted "because it's hardly worth while walking back 40 feet to put two  $10/32 \times \frac{3}{8}$ -inch cap screws back in stock" are returned to stock right on the spot. These little economies added to the time saved can often become the difference between an engine built at a profit or taking a small loss on it.

With this arrangement in the four aisles where the most frequently used weigh-counted parts are located, the time saved daily has been calculated to equal at least one manday. Added to these savings must be reckoned the improved morale, the reduction of waste, and the accuracy and speed with which the assembly kits are gathered—all important factors in controlling costs and speeding production.

## SUGGESTIONS TO HELP SPEED WELDED FABRICATION AND RELIEVE THE ELECTRODE SHORTAGE



In spite of the construction of new plants and tremendous increases in production, there is still a very definite shortage of welding electrodes. The smaller sizes of electrodes and those of the all-position type cannot be manufactured as fast as the larger sizes and those with all-mineral coatings.

Electrode users can, therefore, help relieve the electrode shortage by using sizes as large as practical and by planning their work, so that whenever possible the all-mineral coated rods can be specified.

Using the larger diameter electrodes increases the speed of fabrication, too. For normally, when proper currents are used, the greater the electrode diameter, the higher is the resulting deposition rate. As shown in the above chart, in joining 1" plate with a  $\frac{1}{2}$ " fillet weld, a  $\frac{3}{16}$ " all-position rod deposits only 62 ounces of metal per hour, whereas a  $\frac{1}{4}$ " downhand "hot" rod at 330 amperes, deposits 135 ounces per hour, an increase of over 117%.

Murex engineers are available for consultation to manufacturers who are directly or indirectly engaged in war production—whether or not they are users of Murex electrodes.



Specialists in welding for nearly 40 years. Manufacturers of Murex Electrodes for arc welding and of Thermit for repair and fabrication of heavy parts.

**METAL & THERMIT CORP.**

120 BROADWAY • NEW YORK, N. Y.

**MUREX**  
ARC WELDING ELECTRODES

Albany • Chicago • Pittsburgh • S. San Francisco • Toronto

## ASA Approves First Defense Standard

American Standards Association, 29 West Thirty-ninth street, New York, reported recently the approval of its first emergency defense standard—"Accuracy of Engine Lathes"—which sets up accuracy requirements for lathes in the machine tool industry. It describes a series of tests to be applied for checking engine lathes in respect to such matters as bed level, tailstock way alignment, spindle center runout, lead screw alignment and in turning the work cylindrical when mounted in chuck or between centers.

The accuracy requirements, stated in terms of maximum permissible variations, apply to three groups of engine lathes: Toolroom lathes; engine lathes, 12 to 18 inches inclusive; and engine lathes, 20 to 36 inches inclusive.

"Accuracy of Engine Lathes" will be published at an early date in a distinctive format to identify it as a defense emergency standard. Copies will be available through the association headquarters.



## Develops New Metal Cleaner for All Metals

A new solvent emulsion-type metal cleaner suitable for use on all metals is reported by Cowles Detergent Co., 7016 Euclid avenue, Cleveland.

When applied, Lixol, as the cleaner is known, leaves an invisible oil film, ideal for painting or shop storage. The product produces physically clean surfaces and can be used alone or diluted with water or kerosene.

## Stretching Press

*(Concluded from Page 102)*

three pumps is part of a complete system, thereby providing individual control to the separate stretching members.

Preliminary tests have been made by the builder on both sheet metal and sheet duralumin, using wood dies for the steel and Kirksite dies for the dural. Steel part formed was a corner section of a bus body made from 20-gage automotive deep-drawing stock. Dural parts, for the Goodyear Aircraft Corp., Akron, O., which incidentally is installing one of the stretcher presses, included the bottom plate and the keel of a pontoon for a large flying boat. Sheet was 24 SO grade 0.051-inch thick. Initial tests developed the fact that it was possible to produce a better "stretching" on the keel die with steel stock than with dural.

As with any new type of equipment of this sort, adjustments and adaptations to particular work may be necessary, but the press seems to offer to the metalworking industry a means for shaping sheet metal which has interesting possibilities, particularly in the face of present demand for a wide variety of shapes and forms for aircraft assemblies, most of them involving comparatively small production runs.

It should be pointed out that with the equipment shown in the illustrations, it would not be possible to accommodate any reverse draw work. To handle this an accessory overhead structure can be provided, with a die into which the platen die fits to form such a draw.

## The Converter's Place

*(Continued from Page 112)*

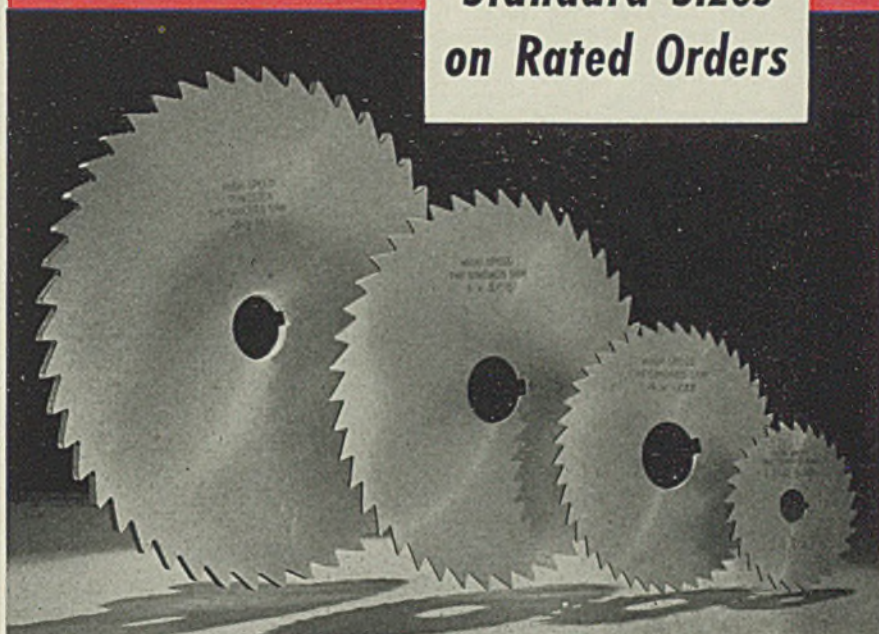
at the end of the blow through addition of the proper amounts of cupola metal, ferromanganese and ferrosilicon.

The composition ranges shown in Table I are given as an illustration and should not be construed as setting hard-and-fast limits. By controlling the silicon content of the cupola metal, the temperature of the

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*Famous Family of Metal-Cutting Tools*

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steel can be regulated between 2900 and 3200 degrees Fahr., the latter being hot enough to pour castings of very light section. The percentage of carbon and other metalloids can be controlled within very close limits.

Because sulphur is picked up in the cupola through contact with the coke, the sulphur content of the molten iron coming from the cupola spout is always higher than in the cold charge. By treatment with alkalis in a receiving ladle the sulphur is readily removed to the percentage desired in the final steel. No change in sulphur content takes

place in the converter itself.

To date no practical method exists for reducing the phosphorus content for the production of castings, so that the original charge must not be over 0.04 per cent in phosphorus.

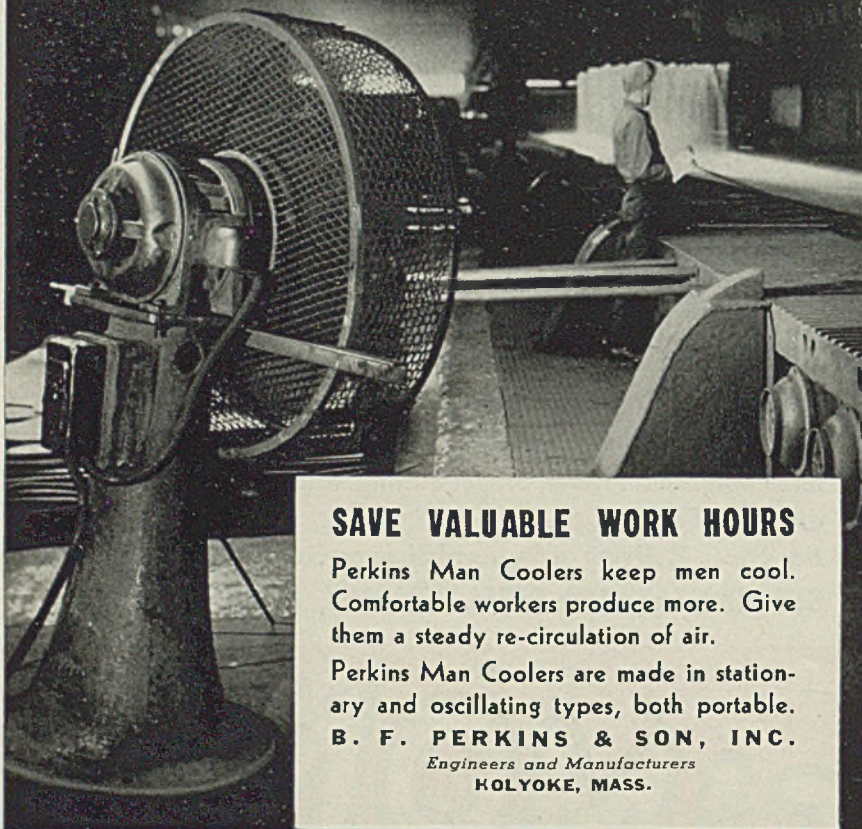
It is interesting to note, however, that a reliable method of phosphorus removal has been perfected and is being used by Gordon Yocum of the Wheeling Steel Corp. for ingot production. This process depends upon treatment of the bessemer steel in the ladle with a mixture of chemicals. The product, in this case, is naturally an oxidized steel

known to the mill man as rimming steel. It cannot be used for castings without a subsequent treatment to remove excess oxides.

Recently several large gray iron and malleable foundries have undertaken to equip their plants to produce steel castings using the side-blow converter process. The main point to bear in mind in any discussion of steel melting equipment for casting production is the fact that successful operation presupposes a certain amount of experience and skill in foundry work. A beginner is bound to run into difficulties no matter what process is employed.

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# B. F. PERKINS & SON, INC.

ENGINEERS AND MANUFACTURERS

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## Conversion—

*(Continued from Page 116)*

depart with their cables, capstans and hoists; jacks and heavy trucks and transporters—leaving behind a bill which is very reasonable for a difficult job well done.

The principal duty of the established service crew is to keep the plant orderly and clean, a state of affairs well exemplified by Fig. 7. They work hard at that because the management believes that only in a clean and orderly plant can worker morale be kept on the high plane necessary to consistently good work, accomplished with speed and economy under pressure and wartime conditions. Sloppy plant housekeeping, sloppy workers and sloppy work go hand in hand. Tolerate any one of them and you will have all three of them with you.

No sign of any one of this evil trio is to be seen in this business machine plant, but it takes ceaseless work with paint brushes, brooms, mops, shovels and cleaning rags—backed up by old-fashioned elbow grease, new-fashioned dust and fume exhaust systems, see Fig. 8, and careful personnel work—to keep them from getting a foot-hold.

Personnel selection and training in this plant are entirely free of fancy frills. Now that we are in the war, it is serious business—very serious business indeed. No applicant is considered unless an American citizen, and no applicant is hired until careful investigation of background, previous training and outside associations proves conclusively that said applicant can be trusted inside a plant whose importance now ranks with that of any government arsenal. On the theory that one bad apple can spoil a barrel full of good apples—the bad apples are kept out of the barrel.

When finally chosen to come within the gates, the new worker—if not previously trained in any of the required skills—is classi-



fied as a learner and is allowed to stand beside a skilled machine operator, inspector, assembler, or other technician. This procedure, as applied to instruction in turret lathe operation, is illustrated by Fig. 9. Care is taken to instill into workers thus being watched, that the more they can do to help the learners, the better are their own chances for advancement—including upgrading to foremanship.

If the learner proves to be mentally and physically "alive" and has reasonable aptitude for the job, he or she is allowed to "take the controls" in the course of a few days. Some slowing up of the job and a certain amount of spoiled work of course then is inevitable, but it is a cheap price to pay for the surprisingly quick development of talent which results. Those who do not show aptitude for the first job on which they are tried out, are shifted around until they hit the spot where they properly belong. Few are hired who do not find their proper place somewhere—the nimble fingered on assembly as in Fig. 5; the critical on inspection; the ingenious on tool design, etc.

There is no royal road to conversion. No government men are going to come in and do it for you—even though eventually they may appear on the scenes to "pressure" laggards into doing it themselves—or into making way for smarter and more patriotic citizens who can and will do so. The right spirit—and the real American spirit—with which to face the issue is that expressed by the management of this Ohio company in the following way: "We are rushing conversion of this plant as rapidly as is humanly possible, and if Uncle Sam needs more and will help us get the tools, we have 25 acres more over which we will extend this plant.

"We won't seek to expand, however, until we have squeezed the final ounce of war production efficiency out of every square foot and every machine tool in our present plant. No company today has any right to ask for more plant and more equipment unless it is getting 100 per cent production out of what it already has, and not even then unless 100 per cent of that 100 per cent production is vital to the war effort of the United Nations.

"All that we ask is that governmental authorities keep feeding us contracts fast enough so that there will be no gaps between the termination of one and the beginning of another. Otherwise we are liable to have a lot of machines down and may have to lay-off several hundred trained workers. Give us the contracts and we will deliver the goods!"

# 100% FOR OFFENSE



● No sacrifice is too great,—no effort too demanding,—that cannot be matched by the fighting spirit and production-will of the Wyckoff plants. Our Navy "E" . . . and now our All-Navy "E" Burgee award signifies only the beginning . . . now more than ever nothing shall daunt or impede Wyckoff production of the precision steels required by our armed forces.



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# WASTE WARDEN

*lend a hand  
to "Keep 'Em Rolling"*

## FOR VICTORY

★ ★

**U**NCONSCIOUS waste in this land of plenty can become a serious handicap in our war effort. Let's take a case in point — oxygen. This element is vital to the speedy production of tanks, trucks, guns, ships, planes, and shells.

Oxygen consumption continues to skyrocket and the bottleneck remains steel cylinders. They just can't be obtained fast enough. But, we can all help by making every cylinder most useful. Here's how:

**Make yourself a Waste Warden.** See that the cylinders keep rolling. Don't let them get tied up in inventory. Be sure that cylinders are shipped back promptly when they are empty — and be sure to get the most gas out of each cylinder. If you see to it that these and other "do" and "don't" suggestions are followed you will be making a worthwhile contribution to our war effort as well as helping yourself. Join the "Waste Wardens". Keep the cylinders rolling.

### WASTE WARDEN SAYS:

- DO** close cylinder valve after use.
- DO** check your hose and connections for leaks.
- DO** keep inventory low.
- DO** return empty cylinders promptly.
- DO** keep tips clean and free from carbon and slag.



- DON'T** use excessive pressure.
- DON'T** use oversize tip.
- DON'T** leave tip burning when not in use.
- DON'T** abuse cylinders.
- DON'T** leave cylinder valves open when gas is not being used.

# Air Reduction

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# Helpful Literature

## 1. Universal Grinder

Fitchburg Grinding Machine Co.—6-page illustrated bulletin describes "Bath" full universal precision grinding machine which is stated as providing complete grinding department for tool room and small lot work. Typical attachments, cutter grinding devices and special attachments for various types for grinding operations are shown.

## 2. Prefinished Metals

Apollo Metal Works—4-page bulletin describes "ChromSteel" prefinished electro-coated steel which can be used as alternative metal. Savings in strategic metals effected through use of this metal are shown with charts.

## 3. Pickling Inhibitor

William M. Parkin Co.—Data sheet presents applications of "Sum-Foam" inhibitor for use in pickling operations wherein heavy blanket of foam is required on surface, and "Nep" inhibitor which decreases solubility of relatively pure iron in acid solution.

## 4. Power Trucks

Mercury Manufacturing Co.—12-page illustrated bulletin No. 153 describes "Mercury" elevating platform trucks with capacity of 6000 pounds. Specifications are given for high lift, low lift and telescoping models of this power truck.

## 5. Copper Alloys

Bridgeport Brass Co.—4-page annual index of contents of 1941 issues of "Copper Alloy Bulletin" which reports news and technical developments of copper and copper-base alloys.

## 6. Weld Positioners

Cullen-Friestedt Co.—12-page illustrated bulletin No. WP-20 describes various sizes and capacities of "C-F Positioners" for maneuvering heavy and awkward loads so that top, bottom and sides are readily accessible for downhand welding. Standard models have capacities ranging from 1200 to 14,000 pounds.

## 7. Porous Bronze Bearings

Bound Brook Oil-Less Bearing Co.—16-page illustrated Die List No. 18 shows and presents complete specifications of tools and dies for making sleeve type, thrust type, flange type, self-aligning and special shapes of "Compo" oil retaining porous bronze bearings for applications in machines and appliances.

## 8. Power Shovel

Link-Belt Speeder Corp.—8-page illustrated bulletin No. 1929 gives complete specifications and explains advantages and features of model LS-60 "Link-Belt Speeder" heavy duty ½-yard machine which may be converted to shovel, dragline, crane, clamshell or trench hoe through simple changes.

## 9. Marking

Jas. H. Matthews & Co.—16-page illustrated supplement A to catalog No. 146 is entitled "Stamping Single and Multiple Characters with Matthews Steel Stamps and Type Holders." Sizes, description and list prices are given for stamps and tools for marking parts and materials.

## 10. Electrical Equipment

Westinghouse Electric & Manufacturing Co.—64-page 1942 "Quick Selector" catalog covers such general subjects as safety switches, "Nofuze" breakers, multibreakers, panelboards, motor controls and motors. New application data on latest equipment in each of these groups is included. Electrical ratings, physical dimensions and circuit diagrams expedite selection of equipment for each purpose.

## 11. Sheaves

Allis-Chalmers Manufacturing Co.—15-page illustrated bulletin B6082-A describes "Vari-Pitch" drive which consists of "Texrope" V-belt drive having one or both sheaves arranged to permit adjustment of grooves, providing large or small pitch or working diameter, and increased or decreased speed of driven shaft.

## 12. Infra-Red

Ault & Wiborg Corp.—Illustrated booklet entitled "New Facts About Infra-Red" is second and revised edition of data on infra-red drying and heating. It covers such subjects as effects of colors and surfaces, when to use infra-red, cost of operation, design of infra-red ovens, and types of finishes available.

## 13. Stainless Steels

Carpenter Steel Co.—Slide-rule type indicator contains summary of technical data on company's grades of stainless steels. Information is given on analysis, magnetic properties, heat treatment, toughness, hot work properties, air hardening, strength at high temperatures, corrosion resistance and other properties.

## 14. Carbide Tools

McKenna Metals Co.—48-page vest pocket-sized booklet contains instruction for user of "Kennametal" steel cutting carbide tools. Covered are such subjects as selection of tools; typical application; design of tools; grade selections; speed, feed and cut; brazing procedure; and general grinding hints.

## 15. Brass Rods

American Brass Co.—24-page illustrated bulletin, "Anaconda Free Cutting Brass Rods," discusses leaded, free cutting brass, "Everdur," phosphor bronze, hardware bronze, commercial bronze, nickel silver and copper, with particular emphasis on brass rod for screw machine parts. Chart permits balancing of material cost against cost of production through graphical analysis.

## 16. Metal Cutting

Simonds Saw & Steel Co.—48-page illustrated booklet, "Facts for Mechanics," lists factual information on how to get the most production from hack saw blades, files and metal bank saw blades, and use of flat ground stock. Sketches show various types of these metal cutting tools, indicating important features of each.

## 17. Combustion Control

Hays Corp.—40-page illustrated catalog No. 41-304 is descriptive of "Hays" centralized combustion control for complete automatic control of steam power plants of all sizes. Units of system are described and schematic diagrams show applications of units to complete systems controlling various types of power plant equipment.

## 18. Colloidal Graphite

Acheson Colloids Corp.—4-page technical bulletin No. 150.4 is one of series pertaining to application of colloidal graphite to industry. Entitled "The Lubrication of Steam Engine Cylinders," bulletin tells how colloidized, electric-furnace graphite dispersed in water and petroleum oil is used in saturated and super-heated steam installations.

## 19. Dust Control

American Air Filter Co.—16-page illustrated bulletin No. 270 contains general description of "Roto-Clone" system of dust control. Seventy-nine illustrations, with brief explanatory paragraphs, show installations in metal working plants, processing plants, chemical and pharmaceutical works, and other industries.

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**20. Heat Treating Data**

Stewart Industrial Furnace division, Chicago Flexible Shaft Co.—56-page vest pocket-size booklet describes complete line of annealing, carburizing, hardening and metal melting furnaces. In addition, it lists specifications for S.A.E. steels, gives characteristics and applications for these steels, and tells of typical heat treating procedures.

**21. Platform Trucks**

Atlas Car & Manufacturing Co.—4-page bulletin No. 1261 lists complete specifications for type HP-2 and 3 platform trucks which are recommended for use wherever loads can be placed directly on platform by hand or cranes. Illustration indicates salient features.

**22. Small Tools**

Brown & Sharpe Manufacturing Co.—512-page catalog No. 34 contains descriptions, specifications, prices and suggested applications for micrometers, rules, protractors, gages, indicators, squares, callipers, dividers, milling cutters, hobs, arbors, adapters, collets, screw machine tools, pumps. Tables of useful information are also included.

**23. Metal Cleaning**

Magnus Chemical Co.—54-page illustrated handbook, entitled "Metal Cleaning in War Time," discusses applications, processes, equipment, cleaning operations and related subjects dealing with such war materiel as shell, cartridge cases, fuses and other parts. Both metal cleaning and supplementary protective coatings are covered.

**24. Sheet Metal Operations**

E. W. Bliss Co.—52-page booklet is entitled, "Computations for Sheet Metal Workers." It describes various types of power press, and explains principles and theories underlying such metal operations as blanking and shearing, drawing and reducing, ironing, coning, sizing and forging.

**25. Electrical Brushes**

Keystone Carbon Co.—24-page illustrated catalog and price list No. K-15 presents complete list of slip ring and commutator brushes for motors and generators. Also given are prices and specifications on metal graphite and carbon products. Application data and pertinent engineering information are included.

**26. Die Castings**

Doehler Die Casting Co.—24-page illustrated catalog shows facilities of company for producing die castings for incorporation in machines and war materiel. Typical parts produced are shown and described. Composition and physical properties of die casting alloys are given.

**27. Rubber Conservation**

B. F. Goodrich Co.—11 x 17 1/2-inch wall chart presents facts which will aid in making rubber products last longer. Effects of sunlight, oil, gasoline, grease, abrasion, overloads, heat or cold, constant flexing and bending and other factors are explained, and steps to extend life of product outlined.

**28. Steel Products**

American Rolling Mill Co.—12-page bulletin entitled "Armco Goes To War," explains company's efforts in promulgating war program. Diversified applications of steel in war machines are shown and briefly explained. Financial statement is included.

**29. Dust Collector**

American Foundry Equipment Co.—8-page illustrated booklet No. 82 deals with line of dust control equipment which comprises two types of equipment for collection of dust and one for disposal of it. Types of equipment are "Dustube" and "Cyclone" dust collectors, and wet disposal unit.

**30. Conveyors**

Alvey Conveyor Manufacturing Co.—22-page catalog No. 105 pictures installations of roller conveyors, live roller conveyors, belt conveyors, chain conveyors, spiral and apron conveyors and vertical and inclined conveyors. Features and advantages of each installation are briefly explained.

**31. Power Substations**

General Electric Co.—28-page illustrated bulletin No. GEA-3592 presents full facts concerning unit substations for power and lighting service requiring 600 volts or less. Large and small plant electric systems, radial systems and secondary network systems are shown in diagrams. Auxiliaries and controls available are described.

**32. Dust Collectors**

Torit Manufacturing Co.—4-page illustrated bulletin No. 115-B describes complete line of dust collectors which are self-contained units for carrying away dust laden air around grinding, cutting and polishing wheels.

**33. Heat Treating Compounds**

E. F. Houghton & Co.—34-page illustrated bulletin is No. 5 of company's regularly issued publication. It describes the making of cartridge links, heat treatment of gun tubes and honing practice in gun making, in all instances placing emphasis on heat treating, quenching, honing and coolant compounds used.

**34. Blast Cleaning**

Pangborn Corp.—8-page illustrated bulletin No. 602 describes type EN-2 blast cleaning cabinet. Features, dimensions and capacities, operation of this unit are given. Guidance is presented for selection of dust collecting equipment.

**35. Gas Welding**

Air Reduction—16-page illustrated bulletin, "Airco in Aviation," discusses oxy-acetylene cutting, production welding, welding jigs and fixtures, flame hardening, metal spraying and engineering aids for use of oxyacetylene welding in aviation industries.

**36. Magnifier**

George Scherr Co.—4-page illustrated bulletin is descriptive of "Magni-Ray" illuminated magnifier for close inspection of parts and for use by assemblers working with minute parts.

**37. Drilling & Tapping**

National Automatic Tool Co.—12-page illustrated catalog No. 520 describes model B-5B general purpose adjustable multi-spindle "Holesteel" machine for multiple hole drilling for all types of work.

**38. Tool Steel**

Jessop Steel Co.—8-page bulletin No. 142 describes features and advantages of "Washington" carbon tool steel. Method of manufacture, processing, physical and chemical properties, hot working and heat treatment are covered extensively. Diagrams amplify data on hot working and heat treatment.

**39. Metal Products**

American Brake Shoe & Foundry Co.—12-page illustrated bulletin is entitled "Brake Shoe at War." It tells how equipment made by company is being used for nation's transportation and for fighting fronts. Action photographs show plant scenes.

**40. Stock Steel**

Bissett Steel Co.—100-page spiral-bound general catalog lists specifications and available stock sizes of aircraft steels, boiler tubes, chisels, cold finished steels, drill rod, shim steel, wire rope, welding rod, stainless tubing, tool steels, and Swedish iron. Chemical and physical properties are listed for some of special steels.

**41. Tool Shanks**

Cooper-Bessemer Corp.—8-page illustrated bulletin No. 52T-1 lists and gives specifications on cast to shape "Victory" tool shanks which may be tipped with tungsten carbide. These shanks are designed for use by those who tip their own cutting tools. Machining required for finished tool is held to minimum.

**STEEL Readers' Service Dept.**

213 West Third St., Cleveland, Ohio

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5-11-42

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## Sheets, Strip

Sheet & Strip Prices, Page 132

High priorities dominate the sheet market, orders at A-1-j or higher absorbing all tonnage, and the larger part carrying ratings at the top of the range. Shipments during first quarter under A-2 and A-3 ratings are not being repeated this quarter. Inquiries with lower priorities receive little attention for only against the higher ratings are mills assured steel supply for rolling. Some producers are able to offer deliveries at about six weeks on both hot and cold-rolled.

Influence of the war program on sheet metal consumption is radical, both as to equipment employed and finishes required. Navy yards are buying freely, in lots of 100 tons or more. Boston navy yard has placed 430 tons with American Rolling Mill Co., Middletown, O., at \$33,046.50.

Various plans to save steel in automobile license tags are being considered, to conform to orders of WPB. Maine may use a decalcomania windshield emblem in lieu of plates, Vermont will use a small date tag with this year's plates, Massachusetts will cover its 1942 date with a metal insert and Rhode Island will use only one plate. Connecticut, which had adopted a permanent aluminum plate, with inserts to change dates, will revert to steel.

Orders for cold-rolled strip are about equal to shipments, demand for cartridge clip steel being heavy. Hot-rolled deliveries are geared to high cold-finished ratings and producers are limited by the flow of semifinished steel. Under regulations covering alloys rollers are anticipating needs 60 days in advance, a difficult problem in view of constantly shifting schedules governing end use of finished material, subject to high priorities.

Heavy ratio of narrow cold-rolled strip bookings requiring heat treating and annealing places a severe strain on equipment with most producers. Practically all stripmakers have added to annealing equipment since the emergency but demand exceeds estimates. Much material requires two or more heats. Much stock formerly plated is now painted, notably in hardware lines. As a result plating lines at some plants are almost idle.

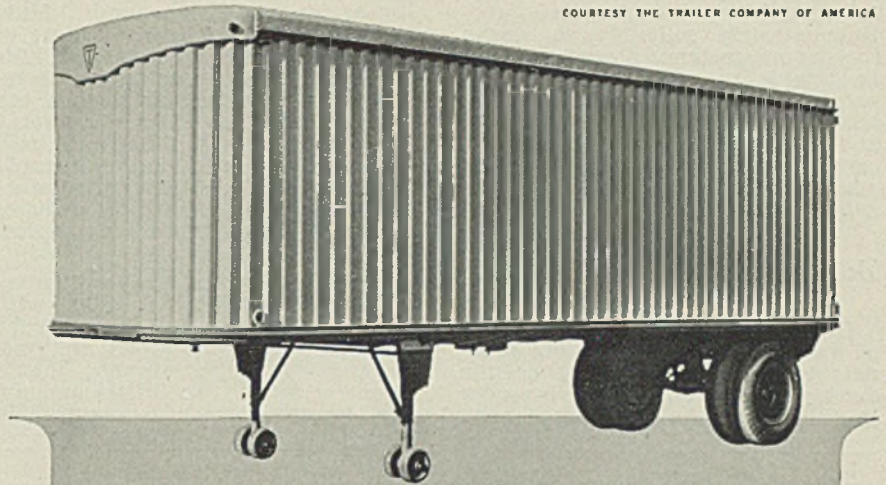
## Plates

Plate Prices, Page 133

Plate bookings have crowded mill books to an extent that complaints are being made that much high-rated tonnage is being entered for projects which will not need the steel during the month specified. Such cases are being investigated in Washington by checking requests against statements of consumers on inventories. Plate producers assert consumers are still disposed to include more tonnage in their applications than they have reason to expect will be allocated them.

Plate deliveries of shipbuilders are being maintained and material for fabricators of ship equipment

COURTESY THE TRAILER COMPANY OF AMERICA



# War material MOVES FASTER IN LIGHTER TRAILERS

How to move more war materials faster is one of the crucial problems of this war. In fact many military men say the vital conflict centers on transportation—more so than during any other war in our history.

Pictured here is one contribution to faster hauling. Truck-trailers made of corrugated ARMCO High Tensile Steel are lighter and carry bigger loads. They are used in transporting war products to various key assembly plants and for carrying supplies to the Army's front-line battlefields.

When used as beams, corrugated ARMCO High Tensile Steel sheets make it possible in many cases to

build sections with only 50 to 65 per cent of the weight of conventional types of construction. Even more weight-saving is possible when similar sections are used as columns.

In the shop ARMCO High Tensile is easy to fabricate. It is much stronger and tougher than mild steel; yet there is comparatively little difference in requirements for cold forming.

Could you use this extra strong steel for your war products? We'll be glad to send you complete fabricating information on ARMCO High Tensile. Just address the American Rolling Mill Company, 1511 Curtis Street, Middletown, O.

**TO KEY MEN:** Ask us for Sheet Metal  
Working Data on War Products and Post-War Products





is slightly better in some instances.

Demand for plates made on continuous strip mills is so heavy that in one instance a producer will be unable to make deliveries on sheets and strip for at least two months under its present schedule and its sheet business is being allocated by the government to other producers in instances where consumers' needs are urgent.

## Bars

Bar Prices, Page 132

Orders eliminating manufacture of a large number of civilian products will have little effect on the demand for steel bars as consumers in these lines have expected such

development and have been preparing as far as possible for it. Mills have been unable for some time to make deliveries on material for such uses and at present can promise deliveries on nothing under the A-1 classification. Much low-rated tonnage is being taken off mill books, producers having endeavored for some time to clear books of much tonnage on which delivery cannot be made for a long period, if at all.

Demand for carbon and alloy bars is broadening steadily, with inquiry for subcontracting involving screw machine work and machining still being strong. Small-diameter stock, two inches and under, for the former, is required in

increasing volume. In some cases bar material is being supplied by prime contractors against orders previously placed, which increases size of releases. Specifications for small arms are heavy and alloys for forgings are in demand. Much of this business is covered by forward or extended contracts, although new buying with high A-1 ratings tends to increase.

Revised specifications for alloys for numerous uses tend to lower nickel content for case hardening and heat-treating, steels in the NE group being substituted, notably 8620 and 8739. Bars of 3.5 per cent nickel are increasingly difficult to obtain, and cold-finished sales have been limited largely for aircraft; efforts are being bent toward restriction of this grade for use where revised specifications with less nickel will meet requirements. Most consumers of cold-finished bars asking tonnage from warehouses have A-1-a ratings.

Farm implement makers, large bar users, are canceling their old ratings and substituting the new A-1-a priorities on certain types of equipment. Meanwhile they are retooling for full war production into which they will move soon.

## Pipe

Pipe Prices, Page 133

Small lots of all types of tubing are tighter with secondary sellers, mills being heavily booked on direct orders with high ratings. Demand for butt-weld pipe is not as strong as for lap-weld, most of the latter going into war expansion projects and industrial installations.

Sales of chromium-molybdenum tubes are being limited mainly to aircraft, with distributor stocks earmarked for such consumption.

Tighter allocations of pig iron tend to raise ratings required for cast iron pipe production. Deliveries of rigid steel conduit are better than for pipe, three to four weeks being promised on an export inquiry recently.

## Wire

Wire Prices, Page 133

Restrictions on use of steel in many industries will have less effect on wire now than would have been the case several months ago, as many producers voluntarily have curtailed many such uses of wire. Backlogs have been well revised, low-rated volume being written off and tonnage now all being covered by war priorities.

Supply of wire rods and capacity of heat treating facilities are choke points in production. High-carbon round wires and specialties lead in demand, flats being slower. Orders for fine wire specialties are heavy and tend to larger individual orders, with A-1 rating on most. Forward contracts specifying monthly shipments indefinitely are frequent on some products. Bookings on a major portion of bookings is A-1-j or better.

Reduction of 50 per cent is expected in stainless available for finishing and chromium-vanadium

# Helping AMERICA Speed the Day of VICTORY with WHEELABRATOR SPEED CLEANING



## HERE'S HOW IT'S BEING DONE WITH THE AIRLESS WHEELABRATOR

**TIME is Saved**—The WHEELABRATOR saves precious minutes and hours on every cleaning job it has ever tackled. Time savings are effected after cleaning, too, because inspection is simplified, and machining and grinding operations are speeded up, due to the sand-free quality of WHEELABRATOR cleaning.

**POWER is Saved**—The WHEELABRATOR effects important savings in horse power—often as high as 80%.

**TOOLS are Saved**—WHEELABRATORS clean products so thoroughly that cutting tools require less frequent grinding. One company, for example, found the life of its cutting tools had increased 300%.

**LABOR is Saved**—WHEELABRATORS require fewer operators, thus releasing manpower for other work.

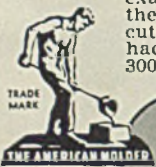
**SPACE is Saved**—WHEELABRATORS minimize cleaning room space not only because they are compact but because they handle more volume per machine in a given period of time.

**MATERIAL is Saved**—Breakage is a bugaboo at any time, especially now, because it means wasted effort and reduced output. With a WHEELABRATOR this difficulty is reduced to a negligible minimum.

**EQUIPMENT is Saved**—A single WHEELABRATOR invariably does the work of a number of machines; and every replacement means important savings in equipment, piping and maintenance, etc.

### TYPICAL PRODUCTS CLEANED

- 
- AIRCRAFT
  - Engine cylinders
  - Valves
  - Bomber wheels
  - Parachute castings
  - Supercharger parts
  - Master rods
  - Propellor blades
- ARMAMENT
  - Shells
  - Bombs
  - Gun parts
  - Gun mounts
  - Trench mortars
- TANKS
  - Treads
  - Links
  - Bogie wheels
  - Housings
  - Armor plate
- NAVAL
  - Armor plate
  - Anchor chain
  - Engine parts
  - Gyroscopes



# AMERICAN

FOUNDRY EQUIPMENT CO.

509 S. BYRKIT ST. \* MISHAWAKA, IND.



wires is likely to be confined to aircraft use. Some producers will not accept orders for galvanized wire in lower A-1 brackets.

## Rails, Cars

Track Material Prices, Page 133

Railroad locomotive manufacturers in March delivered 125 locomotives, compared with 100 in February and 8 in March. Total for three months was 314, against 190 in the corresponding period last year. Unfilled orders at the end of March were 1332 units, compared with 1273 at the end of February.

Heavy allocations of steel rails have been distributed recently, largely for export to Russia under lend-lease. This product requires heavy tonnage of ingots and complicates the supply of steel for other heavy mill products.

## Structural Shapes

Structural Shape Prices, Page 133

Structural shapes are obtainable now in most cases only on A-1-a priority or directed rating. This causes difficulty for fabricators in obtaining steel for what until recently were considered high-rated jobs.

To relieve pressure for structural steel many government jobs are being redesigned for use of wood in part or whole. In some instances these changes have been ordered after steel was in process of fabrication, causing considerable confusion. Three new shops for production of aircraft engine parts, in New England, for Pratt & Whitney division, United Aircraft Corp., will be of reinforced concrete frame and roof spans. Allocations of structural shapes to shipbuilders are on the increase.

## Reinforcing Bars

Reinforcing Bar Prices, Page 133

Small shops fabricating reinforcing bars are running out of business because of inability to obtain material. Mills are able to accept orders only at highest ratings and books are filled with tonnage at the top levels. The effort to save structural steel by substituting reinforced concrete construction is adding to the burden. A Connecticut airplane engine builder will use concrete in three large additions and a Philadelphia plant originally designed for steel, requiring 12,000 tons, was changed to wood and again plans have been altered, to use reinforced concrete. It is estimated this will require 5000 to 6000 tons of bars.

## Pig Iron

Pig Iron Prices, Page 134

Ultimate use of castings in the war production program increasingly influences pig iron distribution under allocations and ratings are being revised upward in some instances for June delivery. Melters formerly working against large inventories have depleted these in most cases and now are being allocated larger supply. Foundries which have not been able to obtain

work carrying priority are receiving little iron.

In New England, foundries producing castings for the machine tool trade are being well covered and in some instances have been able to build up some reserve in castings for their clients. Basic iron deliveries in New England this month are largely from outside furnaces but by July the district furnace will be able to supply more of this grade.

Pig iron allocations, light scrap supply and lack of direct war orders have not cut gray iron foundry output appreciably in the Pittsburgh district over the past six weeks. Considerable confusion has been caused pig iron melters by failure to receive the new PD-69 form for

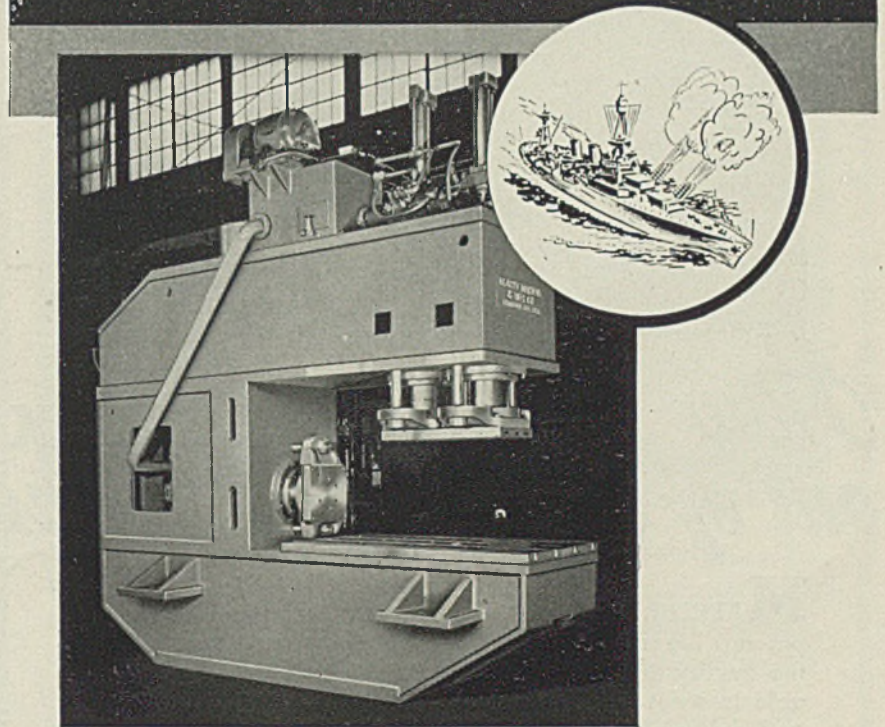
June applications. Many consumers have been forced to use the old forms, altered to fit the new conditions. The new form means the end of shipments on requests for B ratings. No trouble is being experienced in groups A-1-a to A-1-k and A-2 and A-3 but A-4 to A-8 require additional information on final use of the iron, which must be obtained from consumers.

## Freight Increase on Iron, Steel Products Clarified

WASHINGTON

Clarification of the effect of the recent 6 per cent freight rate increase on the prices of iron and steel products under the provisions

# WHAT PUTS THE BATTLE IN A BATTLESHIP?



## BEATTY 400-TON FLANGING AND FORMING PRESS



250-Ton Capacity Hydraulic Press

IT'S ARMOR PLATE that keeps a battleship afloat. The *thicker* the plate, the *stronger* the ship . . . and the more *powerful* the PRESS required to fabricate that armored hull! Beatty-Engineered Hydraulic Presses (up to 750-ton capacities) are being used extensively in the shipbuilding, tank, railroad car, and other vital war industries. But this is just *one* of Beatty's heavy metal working machines. If your production calls for punching, shearing, coping, pressing, forming, flanging or the like, call in a Beatty engineer to help you select the *right machine* for the job. Write for complete information.

# BEATTY MACHINE & MFG. COMPANY HAMMOND, INDIANA



of Price Schedules Nos. 6 and 49 has been announced by OPA.

In general, OPA said, the rule is that the increased freight costs must be absorbed by the steel mill or the steel reseller on incoming shipments, but may be added to outgoing shipments in cases where freight is a component and declared part of the maximum price.

For example, the increase in freight rates on incoming scrap must be absorbed by the steel mills, and does not affect the maximum price at which the mills may sell.

However, the increase in freight from a mill's governing basing point to destination may be added

to the mill delivered price of steel.

There are certain exceptions to this general rule. For example, under Price Schedule No. 6, some prices are "arbitrary delivered prices," such as the delivered prices applicable to Detroit and Eastern Michigan. These may not be increased, except as specific increases have been granted by Amendment No. 4 to Revised Price Schedule No. 6. Also, under Price Schedule No. 49, where the maximum delivered price is limited by the April 16, 1941, prices of named sellers in a "listed city," it is not affected by the freight rate increase.

OPA cautioned that this interpre-

tation applies only to Schedules No. 6 and 49.

## Scrap

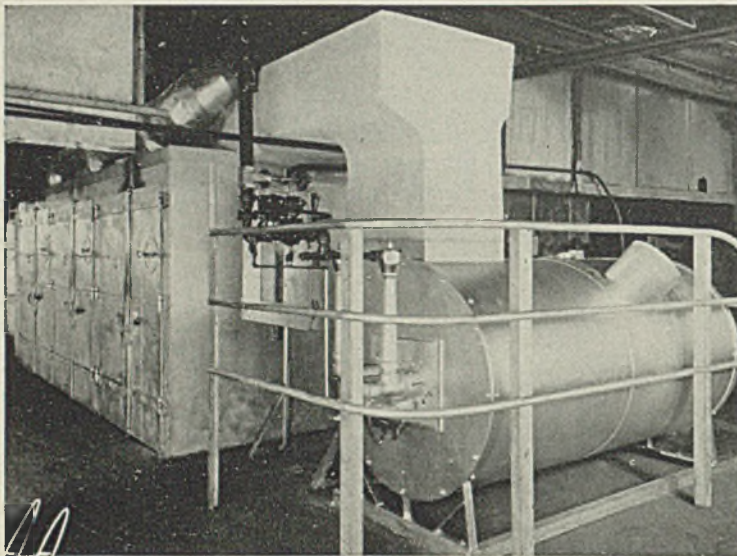
Scrap Prices, Page 136

Office of Price Administration last week issued an order requiring all dealers selling to industrial consumers to be licensed, thus giving closer control of the scrap industry. The order applies to all dealers in waste and salvage materials on which ceiling prices have been placed. All dealers will be considered licensed from May 20 but actual registration must be made by June 20. Violators of price regulations will be subject to revocation of licenses and under such suspension will be unable to do business. This is the first instance of application of OPA licensing power to a specific industry. Dealers generally are licensed by provisions of the general maximum price regulation.

While scrap supply maintains the better rate that developed several weeks ago and most steelmakers have sufficient to maintain a high rate of production, it has not been possible to accumulate reserves and some districts which have had an excess have not been able to hold it, other areas in need being given allocations. A factor in causing uneasiness as to future supply is the fact that many sources now yielding tonnage will be exhausted soon, with consequent drop in supply.

Change in character of scrap produced in the Detroit district has followed conversion from automobiles to war material. Formerly there was considerable variety but under present conditions by far the larger proportion is borings and turnings. Industrial salvage in Michigan has not advanced as much as in some other areas and receipts from this source have not been great. Scrap supply in the Detroit area is larger, though quality is lower.

The British purchasing commis-



# How TO GET MORE WORK out of Old Style Core Ovens

**M**AEHLER Recirculating Airheat Conversion Units will put new life into old style ovens, increase output and improve the quality of your work to such a degree that you may be able to meet war production demands without the expense and delay of installing additional oven capacity. Here's a typical example: A large Midwestern foundry with 4 coke fired brick rack ovens found that increasing work required output equivalent to that of two more of the same type of ovens. However, after consultation with Maehler engineers, they installed a Maehler Oil Heat Conversion Unit for just two of the old ovens and got all of their required work out of these two, leaving the other two old ovens as excess capacity!

It will pay you to investigate this possibility. Maehler engineers will be glad to help you do the job with existing equipment if it can be done.

**THE PAUL MAEHLER CO., 2200 W. Lake St., Chicago**

# MAEHLER

**WRITE FOR New Maehler Heat Treating Furnace Bulletin!**

## Tool Steel Scrap

Cents per pound, to consumers  
f.o.b. shipping point

### Tungsten Types

(For each 1% tungsten contained)

Solid scrap containing over 12% . . .	1.80c
Solid scrap containing 5 to 12% . . .	1.60
Turnings, millings containing over 12% . . . . .	1.60
Do., 5 to 12% . . . . .	1.40
Turnings, millings, solids under 5% . . . . .	1.25

### Molybdenum Types

Solid scrap, not less than 7% molybdenum, 0.50 vanadium . . . . .	12.50
Turnings, millings, same basis . . . . .	10.50
Solid scrap, not less than 3% molybdenum, 4% tungsten, 1% vanadium . . . . .	13.50
Turnings, millings, same basis . . . . .	11.50

### Mixed Scrap

(Molybdenum and Tungsten Types)

Solid scrap, each 1% contained tungsten . . . . .	1.60
Solid scrap, each 1% molybdenum . . . . .	.80
Millings, turnings, each 1% tungsten . . . . .	1.40
Millings, turnings, each 1% molybdenum . . . . .	.70



sion has released 27,000,000 pounds of steel and 500,000 pounds of copper to WPB for American war production. The metal previously was machined into rough field-gun shells made obsolete after the Dunkirk ordnance losses. American ordnance is unable to utilize it in the present condition and London has authorized the British commission to dispose of it as scrap.

Ruling on cars of scrap containing more than one grade, classing them as unprepared, at \$2.50 per ton below the ceiling on the lowest grade, is said to be delaying scrap shipments. Small collectors who do not obtain a full carload of a grade within a month have been accustomed to ship mixed cars as soon as accumulated but under the ruling must be penalized or hold material until a full carload is available. Requests for relief have not yet been effective.

Approximately 10,000 tons of scrap was collected during April in six industrial centers of the New York-New Jersey area. Quantities gathered in the several cities were as follows: Batavia, 286 tons; Buffalo, 1145 tons; Niagara Falls, 1557 tons; Rochester, 2749 tons; Syracuse, 1672 tons, and Newark, N. J., 2395 tons.

A substantial portion of the scrap, largely structurals, from the Atlantic avenue elevated railroad in Boston, is going to the Worcester, Mass., mill and 1050 tons of rails from Boston streets has been allocated to another consumer.

Low phosphorus scrap continues tight but supply of cast scrap is much more satisfactory.

OPA has invited 200 nonferrous scrap dealers and consumers to attend a meeting May 11 at Chicago and May 13 at New York to consider a proposed amendment to various nonferrous scrap schedules, with relation to transportation charges.

OPA has called a conference at Washington May 12 of scrap dealers to discuss the \$5 premium allowed on chemical borings.

A scrap-conscious Middle West during April salvaged enough iron and steel to build eight 35,000-ton battleships for the Navy, or 10,000 light tanks for the Army, according to reports of industrial scrap movement from six states compiled by the Chicago regional headquarters, Industrial Salvage Section, IIC. The states reporting are Illinois, Kentucky, Tennessee, Alabama, Minnesota and Missouri.

## Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 133

Bolt and nut makers report a lull in demand for small sizes used in household appliances, regarded as temporary, as there is increasing degree of ordnance requirements, for aircraft parts in particular. Increasing trend to wood construction calls for large bolts. Late in March more than 15,000 tons was allocated by the army for shipment in second quarter, with prospects for much heavier requirements of this character.

## Semifinished Steel

Semifinished Prices, Page 132

With finished steel demand largely concentrated in heavy products, plates, bars, shapes and steel rails, pressure for ingots and semifinished steel is increasing. Many steel plants are retaining all their ingot output for their own finishing mills, having nothing in addition for non-integrated mills. In the Chicago district it has been thought possible that ingots and semifinished steel from other districts might be necessary to maintain finishing operations.

One factor in the heavy drain on

steel ingots is increased specifications for steel rails, a substantial portion of which is for export to Russia. Export of semifinished items has practically ceased under government orders, to conserve the scrap tonnage arising from finishing operations.

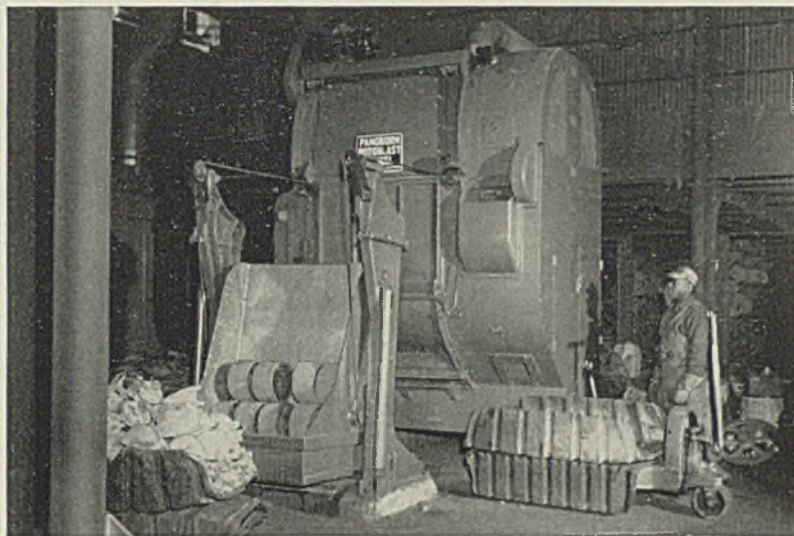
## Fluorspar

Fluorspar Prices, Page 134

Effective May 11, Office of Price Administration has established maximum prices on fluorspar at the level quoted Jan. 2, 1942, by any producer, regardless of contract, lease or other obligation. The price

# IMPOSSIBLE, HELL! PANGBORN DOES IT!

**MORE SHELLS, MORE SHIPS, MORE PLANES,  
MORE TANKS—TO SEND THE YANKS!**



Here at Pangborn the boys are fighting mad. They don't want to remember Pearl Harbor. They want to avenge Pearl Harbor. So day and night they're on the job—working grimly for their part in the taking of Tokio, the bombing of Berlin, the razing of Rome. Deep down, where it really matters, the war has reached home.

That's why—to the last—we're in this thing with hot perspiring brows and clenching fists. Our men have something tremendous to work for—and they know it. They express their willingness to help, not in singing the Yanks are coming—but in getting out—every day and night—bigger and better ROTO-BLAST and Air Blast Barrels, Tables, Cabinets and Rooms to blast clean more shells, more ships, more planes, more tanks—TO SEND THE YANKS!

**MORE OF EVERYTHING TO SEND THE YANKS. IT CAN BE DONE! LET  
PANGBORN HELP YOU DO IT!**

# PANGBORN

WORLD'S LARGEST MANUFACTURER OF DUST COLLECTING AND BLAST CLEANING EQUIPMENT  
PANGBORN CORPORATION . . . HAGERSTOWN, MARYLAND



is to be based f.o.b. on the shipping point customarily used.

Prices in the Illinois-Kentucky area for fluxing or metallurgical grade Jan. 2 were \$23 to \$25, with acid grade \$6 to \$8 higher. Prices at western points were at related levels, reflecting higher freight costs to eastern industrial points.

## Warehouse

Warehouse Prices, Page 135

Steel warehouse order, M-21-b, has been revised by Division of Industry Operations, WPB, to make it conform to order M-21. The latter forbids deliveries by producers on ratings below A-10, except in specified cases. The revision ap-

plies the same restriction to warehouses.

Warehouses are to receive deliveries on quotas established by director of industry operations, in two classifications, A and B. Applications for schedule A quotas are to be made on form PD-83-a. A rating of A-1-k is assigned to warehouses for schedule A products, replacing the A-9 rating, and A-3 is assigned to schedule B products.

Warehouses must report to the Bureau of the Census on or before the fifteenth of each month on form PD-83 for schedule A products and to WPB on form PD-83-f for schedule B products.

Warehousemen feel that the supply situation would be eased if the

government would designate a rating below which orders should not be accepted. Sellers point out that they are forced to take all orders, even below A-1-k rating, and the latter are lifted to the higher rating by the blanket priority to warehouses. They fear concentration of business in higher priorities will leave much tonnage unfilled by mills.

## Pacific Coast

**Seattle**—Pacific Coast industry is geared to the war tempo, plants working to capacity and only the highest priorities effective. No new business is being sought and nothing is booked except under orders from government agencies. Increased secrecy rules in announcement of locations, quantities and amounts.

In Eastern Washington a 320-acre site is reported acquired by Defense Plant Corp., on which it is planned immediately to begin construction of the proposed \$20,000,000 magnesium reduction plant. Contract has been awarded H. K. Ferguson Co., Cleveland, key men already being on the scene. Plans are by Giffels & Vallet Inc. and L. Rosetti, Detroit, designing engineers.

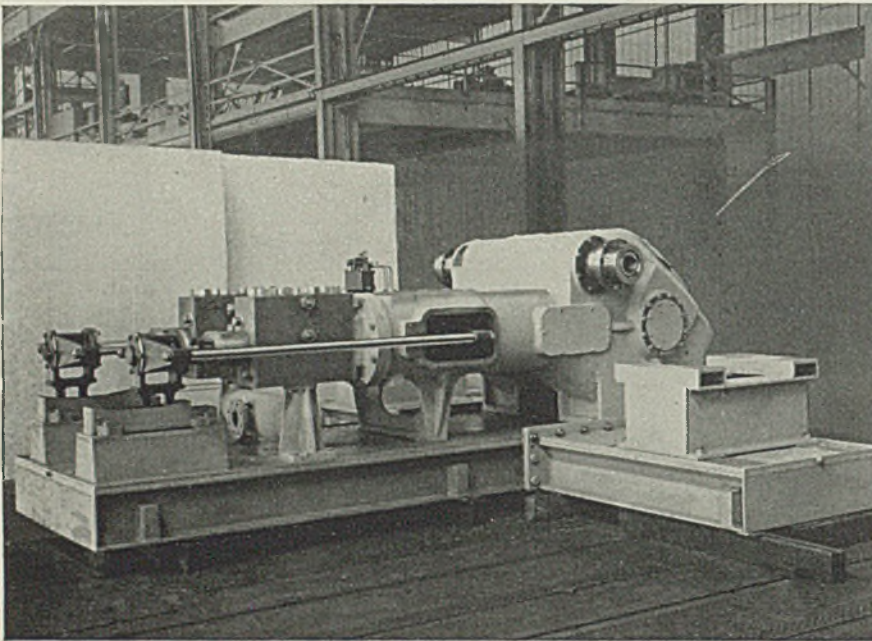
Reports from Portland state that Rustless Iron & Steel Corp., Baltimore, will soon build a smelting plant at The Dalles, Ore., obtaining chrome ore from the John Day area in Oregon, magnesite from Washington state and the Shasta area in California. This project is said to have been approved by RFC and other federal agencies. Engineers are expected soon to complete details. Congressman H. M. Jackson is authority for the announcement that the navy has awarded an additional \$7,000,000 contract for steel construction to the new Everett Pacific plant. The Austin Co. has an additional award of \$3,479,800 for constructing naval facilities at three centers in the Puget Sound area.

Major defense housing contracts have been placed, J. C. Boesflug Co., Seattle, having a \$2,077,000 award for 500 permanent units at Renton, Wash., and Nettleton Lumber Co., Seattle, a \$1,151,719 contract for 300 units at Kirkland, Wash. For building 3278 units at Vancouver, Wash., award has gone to J. E. Haddock Ltd., Pasadena, Calif., at \$9,888,100. These projects involve water, sewer and other facilities.

United States engineers at Seattle and Portland are placing large contracts for facilities and construction in the Northwest, low bidders including Jones & King, Hayward, Calif., and J. A. Terteling & Sons, Boise, Idaho, for work at an Eastern Oregon ordnance base.

H. G. Purcell, Seattle, will furnish about 1200 tons of 8 to 30-inch cast iron pipe, both sand cast and centrifugal, for the Airport Way improvement, Seattle, originally awarded welded steel pipe.

Scrap continues to arrive in large volume, mills reporting ample supplies but due to heavy consumption inventories show no increase.



## HYDRAULIC PUMPS

**HORIZONTAL DOUBLE ACTING DUPLEX TYPE PLUNGER PUMPS** designed for 90 to 250 gallon per minute delivery at pressures of 2850 to 5000 lb. per square inch.

Suitable for Air-Hydraulic Accumulator applications for hydraulically operated presses and machinery.

- HYDRAULIC PRESSES
- ACCUMULATOR CONTROLS
- AIR-HYDRAULIC ACCUMULATORS
- EXTRUSION PRESSES
- ENGINEERING OF COMPLETE HYDRAULIC SYSTEMS

**SCHLOEMANN**  
ENGINEERING CORP. PITTSBURGH, PA.  
Rolling Mill Machinery Hydraulic Presses



Cast scrap is still scarce, some foundries having trouble in obtaining sufficient for contracts in hand.

**San Francisco**—Due to defense priorities many private projects requiring plates and shapes are being held in abeyance. Bids open May 12 for 17,451 tons of 36 to 48-inch cast iron or welded steel pipe for a Public Defense Works project at San Diego, Calif. If steel pipe is purchased close to 5200 tons of plates will be needed. To date this year 4765 tons has been placed, compared with 18,777 tons for the corresponding period in 1941.

The navy has placed a contract with an unstated company for two floating drydocks for the Pacific Coast, involving 4400 tons of plates and 1650 tons of shapes. Associated Shipbuilding Co. has been awarded eight mine sweepers requiring 1600 tons each of plates and shapes. Plate awards aggregated 7049 tons, bringing the year's total to 1,441,110 tons, compared with 211,051 tons for the same period a year ago.

United Concrete Pipe Corp., Los Angeles, has been awarded the contract for improvement of the Los Angeles river between North Broadway and Alhambra avenue, Los Angeles, at \$1,401,391. Bearing and sheet piling required involves 518 tons. Bids open May 15 for the Davis dam near Kingman, Ariz., which calls for installation of 741 tons for cranes, 570 tons for trash racks, 277 tons for hoists and spillway gates, 135 tons for bulkhead gates, 1122 tons for fixed wheel gates and 195 tons for stop log guides. In addition the project requires 7000 tons of reinforcing bars, 812 tons of plates for a penstock and 425 tons of shapes for steel roofing and crane runway. Bids have been opened on 123 tons for railroad bridges in connection with improvement of the Burbank-Western channel from Victory boulevard to Lockheed channel, Burbank, Calif. Awards totaled 3772 tons and brought the aggregate to date to 483,689 tons, compared with 159,816 tons for the same period in 1941.

Practically all reinforcing bar tonnage produced on the Pacific Coast goes into defense projects. Awards totaled 841 tons, bringing the total to date to 50,276 tons, compared with 39,590 tons for the corresponding period in 1941.

### Canada

**Toronto, Ont.**—Sharply increased demand for steel on war account since the beginning of the year, chiefly due to creation of new war industries, and general expansion in production of war materials as a whole, has practically wiped out all deliveries to non-essential consumers and even more drastic action in this respect is under consideration. In addition to strict control of iron and steel, the Department of Munitions and Supply has announced a new order which gives it complete control of all nonferrous scrap materials and prohibits sale to any but essential war industry.

Demand for sheets on war account has reached such magnitude that Canadian mills, operating close to capacity in these departments, have little available for ordinary domestic purposes and as a result are declining all orders except those directly associated with the war.

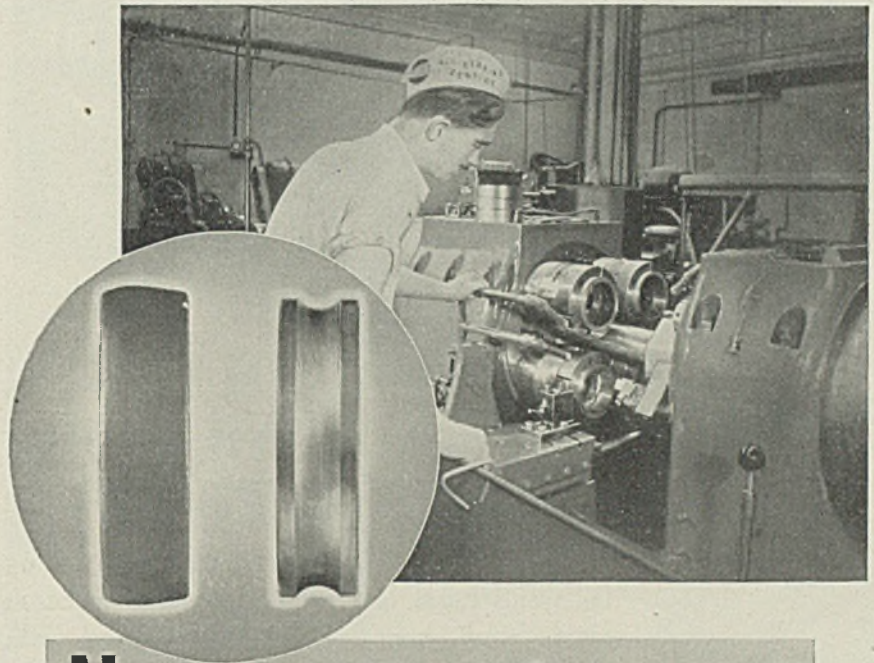
In order to maintain a steady flow of plates, mills are operating well above normal capacity, at the expense of other departments, which have had to curtail, due to insufficient supply of steel. Plate production in Canada now is far beyond any previous record but falls far short of meeting all requirements.

Merchant bar bookings are steady and mills have more business on

books than they can handle, while delivery dates on new orders are much extended.

In merchant pig iron conditions show no change from the preceding few weeks. Demand is well in excess of supply and shipments are going only to melters engaged on war contracts.

Considerable new interest has developed in iron and steel scrap. Supplies are pouring in from many sources and dealers have been forced to increase yard crews. Automobile wreckers are advertising for men, but report difficulty in obtaining experienced workers. Despite sharp increase in offerings, demand is keeping ahead of supply.

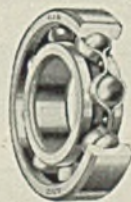


## NON-STOP Performance

in **(CJB)** Bearings as well as in chucking machines.

**AUTOMATIC EQUIPMENT** increases efficiency and consequently improves quality of the product.

The four spindle Chucking Machine shown above operates continuously with no stop for loading or unloading. It completely machines forgings into bearing races which is the first step in production—from forge shop to finished bearing.



This type of efficiency and planning promotes **QUALITY** which is the "watchword" throughout the Ahlberg organization. Also your assurance that **(CJB)** Ball Bearings give long life and consistently good performance.

**AHLBERG**  
**BEARING COMPANY**  
Manufacturers of (CJB) Master Ball Bearings  
**(CJB) AHLBERG** ★ 3015 WEST 47th STREET • CHICAGO, ILL. ★  
*Out West its* **PRECISION BEARINGS, INC.** Los Angeles



## Nonferrous Metal Prices

		Copper			Straits Tin, New York		Lead	Lead	Zinc	Alumi-	Anti-	Nickel
		del. Lake,	Castng,	Spot	Futures	N. Y.	East	St. L.	num	mony	Cath-	
May	Conn.	Midwest	refinery						99%	Amer.	odes	
1-8	12.00	12.12 1/2	11.75	52.00	52.00	6.50	6.35	8.25	15.00	14.50	35.00	
F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 12.00c Conn. copper												
<b>Sheets</b>												
Yellow brass (high)				19.48								
Copper, hot rolled				20.87								
Lead, cut to jobbers				9.75								
Zinc, 100 lb. base				13.15								
<b>Tubes</b>												
High yellow brass				22.23								
<b>Rods</b>												
Seamless copper				21.37								
High yellow brass				15.01								
Copper, hot rolled				17.37								
<b>Anodes</b>												
Copper, untrimmed				18.12								
<b>Wire</b>												
Yellow brass (high)				19.73								

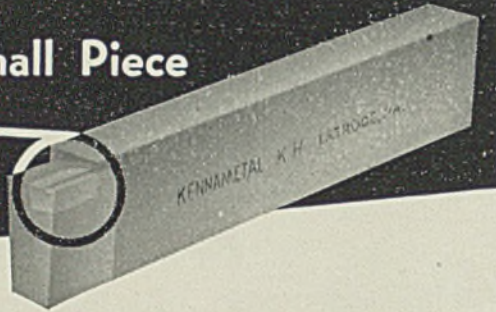
## OLD METALS

Dealers' Buying Prices  
(In cents per pound, carlots)

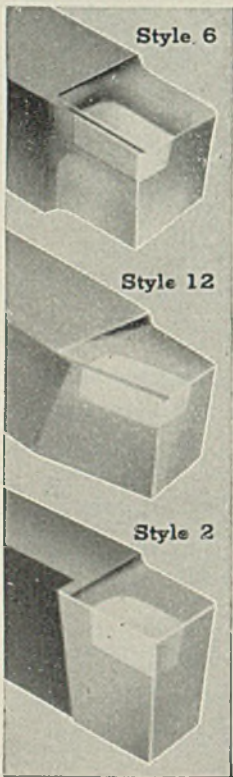
<b>Copper</b>		
No. 1 heavy	9.50-10.00	
Light	7.50- 8.00	
<b>Brass</b>		
No. 1 composition	9.00- 9.50	
Light	6.00- 6.50	
Heavy yellow	6.50- 7.00	
Auto radiators	7.25- 7.75	
Composition turnings	7.75- 8.25	
<b>Zinc</b>		
Old	5.25- 5.75	
New clippings	6.75- 7.25	
<b>Aluminum</b>		
Clippings	10.50-11.00	
Cast	10.00-10.50	
Pistons	10.00-10.50	
Sheet	10.00-10.50	
<b>Lead</b>		
Heavy	5.12 1/2 - 5.62 1/2	
Mixed babbitt	6.00- 7.00	
Electrotype shells	5.00- 5.75	
Stereotype, Linotype	6.50- 7.50	
<b>Tin and Alloys</b>		
Block tin pipe	45.00-47.00	
No. 1 pewter	37.00-39.00	
Solder joints	9.50-10.00	
<b>SECONDARY METALS</b>		
Brass ingot, 85-5-5-5, l.c.l.	13.25	
Standard No. 12 aluminum	14.50	

## DOUBLE YOUR MACHINE TOOL PRODUCTION

With this Small Piece  
of METAL



## How KENNAMETAL can help you contribute To the WAR EFFORT



Machine tools such as engine lathes, boring mills and turret lathes often produce twice as much work per day when equipped with KENNAMETAL tools. KENNAMETAL machines steels up to 550 Brinell hardness at speeds 2 to 6 times as great as those possible with high speed steel. It removes 3 to 10 times more metal between regrinds and often saves additional time by roughing and finishing in one cut.

Be sure you get everything possible from every machine in your plant. KENNAMETAL can be installed quickly on old or new machines . . . and if you are now using high speed steel tools, KENNAMETAL can double your output of steel parts.

WRITE FOR FREE KENNAMETAL  
VEST POCKET MANUAL



# McKENNA METALS Co.

200 LLOYD AVE., LATROBE, PENNA.

Foreign Sales: U. S. STEEL EXPORT CO., 30 Church St., New York  
(Exclusive of Canada and Great Britain)

## Nonferrous Metals

New York—OPA has issued a revised price schedule No. 20, increasing quantity premiums, changing special preparation premiums, adding base prices for six new grades, and adjusting former base prices. The new schedule is effective May 11. OPA continues to make changes in price schedules, reflecting in part experience gained and the influence of additional technical men to the staff.

**Copper**—WPB has limited in an amendment to M-9-a, shipments of copper products from brass mills, wire mills and foundries to ratings of A-1-k or higher, unless specific authorization is given for a lower rated shipment. This will freeze additional stocks of copper products which ultimately will be available for war work. WPB also has prohibited the use of copper and its alloys in an additional 100-odd civilian products; curtailed other uses after June 15, and ordered a number of other restrictions designed to conserve supplies of the red metal.

**Lead**—Lack of consumption in war work rather than a lack of lead is the chief concern of lead fabricators. The supply continues to increase but the government agencies are hesitant in directing a larger flow into industries producing war goods.

**Zinc**—All interested parties expect the full allocation of zinc after June 1 will be handled as smoothly as the present allocation from the pool. The rate for May is 75 per cent of high grade, 50 per cent of other grades of metallic zinc, and 10 per cent of zinc oxide, based on January output.

**Tin**—Consumption is being held down to about 70,000 long tons this year compared with 100,420 in



1941. Of these totals 31,500 and 48,400 tons, respectively, are accounted for by the tinplating industry.

## Steel in Europe

Foreign Steel Prices, Page 135

London—(By Cable).—Steel production is maintained at high level with small tonnages available for ordinary industrial needs at reasonable delivery. Marked acceleration is noted in steel. Semifinished and scrap supplies are improving. Demand of black plates is steady.

## Relayer Prices Up

OPA has announced higher maximum prices on lighter weights of relaying rails, following findings that previous rates were too low. Amendment No. 2 revised price schedule No. 46, effective May 11. This names maximum prices of relaying rails in carload lots on rails 45 pounds or more per yard but less than 60 pounds at \$35.84 from \$32. On rails 35 to 45 pounds their maximum has been increased from \$32 to \$32.90. Commission of \$1 per ton to agent of purchaser has been revoked, except in special cases.

## Mirrors of Motordom

(Concluded from Page 64)

ning the use of iron and steel in 400 products from biscuit boxes to lobster forks, so he might just as well let his instructions be permanent. One cannot help but be amazed and chagrined at the sub-surface conflict which government officials appear to be continually waging against industry. Amazement springs from the fact that industry in general has been able to do such a commendable war production job in the face of this conflict; chagrin is the natural reaction in the face of the complete dependence of the United Nations on American industry to supply needed weapons in a hurry.

K. T. Keller, Chrysler president, told his directors at a recent meeting how the company's engineers have co-operated to devise savings on war work, both in machines and time. On one operation at the tank arsenal means were found to use an automobile production machine so that six other machine tools were released for other work. On one part of the anti-aircraft gun Chrysler is making, engineers suggested a change which resulted in increasing production on that part 800 per cent, eliminated the need for buying six machines required elsewhere, and saved 30 pounds of critical material on each gun. Revision in another part for the same gun eliminated 11 pounds of aluminum and 20 pounds of lead. On still another part, the use of a particular type of fixture and machine brought a 300 per cent increase in production

and a saving of more than \$168,000 on equipment.

Although the word is out that there are to be no more new war plants in the Detroit area, because of what looks to be a certain labor shortage months hence, discussions are heard of some new projects. One is a new steel forging plant, proposed for erection on the west side of the city and to be operated by an old-line parts supplier for manufacturing gun barrels of a medium caliber anti-aircraft gun.

For machining large metal plates to be used in experimental aircraft work in a plant here, some heavy planers were required but were not

available, until a diligent search by the tooling information service of the Automotive Council for War Production "discovered" suitable planers in the plant of a southern Indiana limestone company where they were being used to cut 15,000-pound blocks of stone.

General Motors will return to the radio for the first time in many years with a new one-hour program titled "Cheers from the Camps," beginning in June, Tuesday evenings at 9:30, Columbia Broadcasting System. Talent will be the boys in the camps themselves. War Department and the 670 units of the U.S.O. will co-operate in the staging.



● The most serious blockades in America's war effort today are those occurring in the great plants producing war materials. Delay in getting parts and assemblies from one machine to the next, and the lack of a definite production pace tying together all departments, is keeping production down. Mathews engineering hours are devoted entirely to the solution of these problems. Mathews

Conveyers are breaking these blockades by speeding materials from one machine to the next, through inspection and into cars or ships. The success of our production depends upon our keeping materials moving. Mathews Conveyers are moving them.



If you are manufacturing war material, or anything vital to the success of the war effort, you can get Mathews Conveyers to handle that material. Rely as usual on your Mathews Engineer.

MATHEWS CONVEYERS FOR MECHANIZED PRODUCTION

**Mathews CONVEYER CO., ELLWOOD CITY, PA.**



# NEW BUSINESS

Plant Expansion, Construction and Enterprise, Government Inquiries,  
Sub-Contract Opportunities, Contracts Placed and Pending

## SUB-CONTRACT OPPORTUNITIES . . .

Data on subcontract work are issued by local offices of the Contract Distribution Branch, WPB. Contact either the office issuing the data or your nearest district office. Data on prime contracts also are issued by Contract Distribution offices, which usually have drawings and specifications, but bids should be submitted directly to contracting officers as indicated.

Boston office, Contract Distribution Branch of WPB, 17 Court street, is seeking contractors for the following:

SC-31: Facilities for cylindrical grinding,  $\frac{3}{4}$  to 1 inch in diameter and 12 inches long. Inquiries to Providence, R. I., office of WPB.

SC-32: Facilities required for seamless steel carbon dioxide cylinders from 1 to 6-pound capacity. Cylinders range from  $3\frac{1}{2}$  x 9 inches to 6 x 16 inches. Working pressure maximum 1800 pounds.

SC-33: Facilities wanted for casting 12,000 or more per month of aluminum cored castings weighing approximately three pounds each. Inquiries to Boston office of WPB.

SC-34: Facilities are urgently needed requiring use of engine lathes with 36 to 40-inch beds. Concerns with available time on such units are requested to advise Boston office of WPB at once.

SC-35: Facilities are needed for pressure casting bronze or brass for average 40 to 50-pound pressure of water. Dimensions of castings 12 to 30 inches diameter. Weight 200 to 700 pounds. Prime contractor will furnish patterns. Quality rather than price will influence placement.

SC-36: Facilities are urgently needed for an A-1-a priority order for cutting of 10,500 pieces of stainless steel with brinell hardness of 325, from 2-inch bars. Pieces to be cut in  $\frac{3}{4}$ ,  $1\frac{1}{4}$  and  $2\frac{1}{2}$ -inch lengths. Bars to be furnished by prime contractor.

SC-37: Connecticut manufacturer requires services of 36, 48 and 60-inch planers, 3 and 4-inch bar horizontal boring mills, 11 and 13-inch column 5-inch arm radial drills, precision internal and external grinders. Work is of precision nature, tolerances for finish, dimension and shape extremely close. Metal is high-strength gray iron castings, 1000 to 5000 pounds per part.

New York office, Contract Distribution Branch of WPB, 122 East Forty-Second street, New York, reports the following subcontract opportunities:

D-17: New Jersey manufacturer of aircraft hardware is seeking automatic and hand screw machine capacity for manufacture of 15 wire terminals; turnbuckle sleeve-type, 7 sizes, sleeve-type, 2 sizes, cable fork, 2 sizes, cable eyes 4 sizes. Material, stainless steel, which can be purchased from the prime contractor. Dimensions, from diameters .160-inch to 1.344-inch and lengths from 1.818-inch to 4.348-inch. Tolerances, precision. Quantities, lots of 2, 5 and 10,000. Orders may be

placed on any single item from 1000 to 40,000. Machines needed, automatic screw machines, drill press, milling machine, grinding and polishing equipment. Drawings, specifications and samples at New York City exhibit.

S-119: A large New Jersey instrument manufacturer needs subcontractors for automatic screw machine parts on close tolerance work. Facilities required include B & S 00, 0, 1 and 2.

D-18: A Michigan manufacturer on important war orders is seeking tool-making facilities for production of 35 special precision tools from high-speed steel. Samples at New York City exhibit. Items needed, special end-cutting form cutter; special forming tool; long combination step drill and sub-land drill; special shell reaming tool. Tolerances, precision. Quantities from 1 to 100. Machines needed, precision toolmaking facilities, including centering, milling, lathe, heat treating and external grinding, boring and internal grinding.

S-120: New Jersey manufacturer seeks subcontractors to produce 25,000 check nut blanks of stainless steel, free machining. Tolerances are moderate. Machines needed No. 0 Brown & Sharpe screw machine. Special counterbores can be furnished and material is available.

S-121: A New Jersey firm seeks subcontractors who can make cast iron parts weighing approximately 1000 pounds. Machines needed, planer-type milling machine with circular table to swing work 54 inches in diameter or horizontal boring mill with vertically mounted table.

D-19: A Cleveland manufacturer making aircraft fuel pumps is seeking subcontractors who can furnish steel rotors and rotor blades. Rotor is made of nitralloy steel, is 3 inches long and  $1\frac{1}{4}$  inches in diameter. Tolerance is .0003. Quantity needed is 1000 to 5000 per month. Machines needed, screw machines, hand or automatic,  $1\frac{1}{2}$ -inch capacity; centerless grinders, cylindrical grinders, surface grinders, vertical millers, horizontal broaching machines, 18-inch; lapping and stoning equipment and nitriding equipment.

Milwaukee office, Contract Distribution Branch of WPB, 161 West Wisconsin avenue, Milwaukee, Wis., is seeking contractors for the following:

WP224: Wisconsin firm wants use of large planer to machine an engine base weighing 55,000 pounds, measuring 22 x 7 x 5 feet.

WP225: Prime contractor seeks thread grinder, class 4, for finishing 10,000 pieces at rate of 800 per month. Pieces

are 3 inches in diameter and  $1\frac{1}{4}$  inches long.

WP234: Prime contractor wants subcontractors for screw machine part about 13/32-inch x  $1\frac{1}{4}$ -inch, No. 1335 steel bar stock, class 2 thread and 5/32-inch drill full length. Item is cadmium plated.

WP235: Prime contractor will subcontract for monthly deliveries of 500, 1000 and 1600 on 33 pieces for OE-1660 sight assembly complete. Includes bar stock, brass castings, forgings and screws. Plans at Milwaukee WPB office.

WP236XOS: Subcontractor needed to cast and/or machine trunnion axle, molybdenum steel casting, 60 inches long and 11 inches diameter, like an elongated yoke. Machining requires boring a 5-inch hole in the center, turning and facing. The closest tolerance is plus .000, minus .0005.

WP237XOS: Contractor needs 2000 plain steel castings. Item is a trunnion shaft bracket, 35 inches long x  $1\frac{1}{2}$  inches wide and 5 inches deep. Machining requires milling, drilling, boring and disc grinding.

WP242XOS: Prime contractor offers subcontractor continuous production on 400 per month of each of two types of bevel gears for aircraft use. Requires heat treating facilities; automatics; disc grinder; broaching machine; turret, Borematic, Gleason gear generator and honing machine.

WP243XOS: Prime contractor requires continuous monthly production of 800 of one and 400 of similar type cam breaker.

WP244XOS: Large aircraft engine manufacturer desires bidders on shaft with 1-inch diameter and 5 inches overall. Equipment necessary includes cylindrical grinders, hobbing machines and thread miller.

WP245XOS: Contractor requires 3500 each of two small airplane motor shafts. Requires automatic screw machines, turret lathe, cylindrical grinder, lathe for turning eccentrics, spline miller and thread miller.

Chicago office, Contract Distribution Branch of WPB, 28 North Wacker Drive, is seeking contractors for the following:

BAT-O-1209: Chicago prime contractor wishes to contract work for the following type of machine: Automatic screw machine for stock  $1\frac{1}{4}$ -inch diameter, equivalent of 6190 SAE steel. Quantity 6000. Prime contractor has stock on hand. Drawing available at Chicago office.

RTDC-A-1124: Facilities required to machine forgings made of SAE 4640 steel ranging up to 24 inches in diameter. Can be done on 36-inch vertical boring mills, lathes with 24-inch swing, gear shapers up to 20-inch diameter. Quantities at present 1000 to 2000 of each part. Material to be furnished by prime contractor. Blueprints at this office.

CMC-1010: Urgent requirements for gear cutting equipment capable of turning out 600 to 1200 bevel gears per month. These are for use in air-



craft motors, tolerances are close. Most gears will be integral with shaft, between 1½ to 2 inches P.D. All material by prime contractor.

**YSLC-A-1202:** Eastern manufacturer has work to sublet for a horizontal boring mill with a 4 or 5-inch bar. In addition to this requirement this office has on the list several concerns requiring horizontal mills with bars up to 6 inches.

**4-AN-403:** Prime contractor for airplane parts is ready to subcontract entire fuel pump or components, 1000 per month, close tolerances and 100 per cent inspection. Drawings at this office. All materials furnished. Priority A-1-a.

**53-AN-416:** Middle west manufacturer urgently needs and will subcontract immediately 14 pieces (special bolts, nuts and aluminum rings), which may be divided among six different subcontractors, 500 to 1000 pieces per month for seven months. Hexagon bar stock 2330 steel will be furnished by prime contractor. Equipment required includes hand screw machines capable of handling 1-inch, 17/16, 2 and 2¼-inch hex bar stock. Operations are: Rough machine, heat treat, centerless or cylindrical grinding, drilling and thread cutting. Close tolerances. Aluminum parts made of 5/8 and 6½-inch outside tubing and can be handled on lathes capable of close work. Work schedules and blueprints for inspection at this office.

**72-AN-423:** Subcontractor wanted with No. 2 single-spindle automatic screw machine for lots of 5000, 10,000 and 25,000 on control sleeve, outside diameter ¾-inch. Material is cold-rolled steel.

Cleveland office Division of Contract Distribution, WPB, Union Commerce building, is seeking contractors for the following:

**D-58:** Subcontractor with available facilities consisting of automatic screw machines from B & S No. 000 to 1½-inch bar, to fabricate quantity of small parts, 400 different items of which representative items are on display at Cleveland office. Will negotiate. Blueprints on file at Cleveland office.

**D-59:** Subcontractor with facilities to rough turn shell, approximately 1½-inch diameter x 4¾-inch length. screw machine, 1½-inch bar, or turret. Equipment indicated, multiple-spindle screw machine 1½-inch bar, or turret lathe. Material, 19/16-inch x 4150 shot quality steel bar, furnished by prime contractor. Samples on display at Cleveland office.

**D-60:** Tool and gage facilities urgently needed to machine complete 1000 each of five small special tools. Requires automatics or screw machines up to 1½-inches; small lathes; drills; external grinders; surface grinders; tapping and heat treating equipment. Delivery, immediate. Material, tool steel similar to colonial No. 6. Will negotiate for entire requirements to Jan. 1, 1943. Blueprints and samples at Cleveland office.

**1-S-145:** Subcontractor to machine complete brackets made of steel castings at rate of 700 pieces per month of two items. Equipment indicated, 2-inch horizontal boring mills, No. 3 milling machines, medium and small drills, tapping and threading machines. Material to be furnished by prime contractor. Blueprints on file at Cleveland office.

**6-S-5:** Subcontractor to machine welded cases (78 x 126 x 70 inches high). Equipment indicated, 96-inch planer; 7-foot radial drill, vertical travel 72-inches, crossfeed 165 inches, 96-inch outboard support. Limits close. De-

livery indefinite. Prints on file at Youngstown, O., office. Welded cases furnished.

**6-S-11:** Subcontractor to machine cross-rail for vertical boring mill. Crossrail is 30 x 30½ x 13 inches. Equipment indicated is 6-foot openside planer, horizontal boring mill and 4-foot radial drill. Blueprints on file at Youngstown, O., office.

**8-S-1:** Subcontractor wanted by Pittsburgh firm to machine three sets lathe head stock and cover. Equipment required, 8 x 10-foot stroke planer and horizontal boring mill with 4-inch bar or larger; planing only acceptable. Material, nickel cast iron. Delivery, complete by July 15. Blueprints on file.

**8-S-2:** Subcontractor wanted by Pittsburgh firm to machine three lathe

beds, two sections in each. Equipment, 8 x 30-foot stroke planer. Material nickel cast iron. Delivery, complete by August 30. Blueprints on file.

Philadelphia office, Contract Distribution Branch, Production Division, WPB, Broad Street Station Building, reports the following subcontract opportunities:

**8-21-1:** WPB office in Allentown, Pa., wishes to locate subcontracting facilities on gray iron castings weighing a ton or more, consisting of cored work in dry sand molds. Companies interested should contact the Allentown office and state the maximum weight per casting, maximum output per week and whether they have ovens for drawing molds.

**11-20-2:** A New Jersey prime contractor is looking for subcontracting facilities

AVOID  
COSTLY  
DELAYS



When charging high scrap mixtures in basic open hearth practice . . . stop expensive foamy reactions, hot roofs, and soft heats . . . use No. 34-30 Mexican Graphite under the lime to give efficient, dependable carbon recovery . . . provides a good working period and helps clean up the hearth quickly . . . contains no sulphur or harmful impurities . . . avoid carbon delays and make steel more quickly with a modern recarburizer highly efficient . . . full particulars and prices quoted upon request.



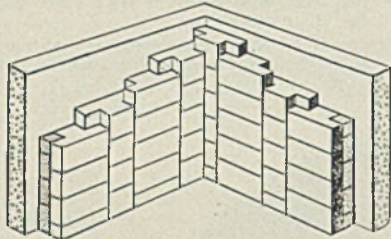
THE UNITED STATES GRAPHITE  
SAGINAW

NO. 34-30 CO.  
MEXICAN MICH.  
GRAPHITE



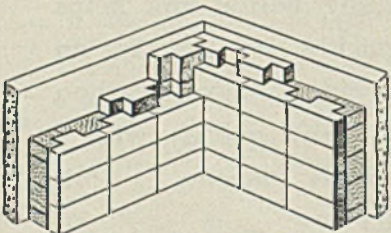
*Keagler-Nukem*

**MONOLITHIC  
ACID PROOF  
CONSTRUCTION  
BRICK SHAPES**



SHOWING SINGLE BRICK LINING  
(PATENT APPLIED FOR)

Here is a new brick shape, manufactured of fire clay by the deairated method, and highly resistant to acid. It guarantees maximum strength of acid proof wall, and is particularly adapted for high temperature pickling tank construction. The bricks are so shaped that walls may be made 5" or 8" without using additional brick. The type shown above is especially adapted as a sheathing for steel rubber-lined tanks, concrete shell tanks, acid pits or wooden tanks. Samples and catalogs sent on request.



SHOWING DOUBLE BRICK LINING  
(PATENT APPLIED FOR)

**KEAGLER  
BRICK CO.**



STEUBENVILLE, OHIO

for a component part. Size is 2.295" diameter, over-all length 1.635". Material needed is steel WDX 1314 cold drawn. Quantity: 100,000 pieces at rate of 1000 per day, starting July 15. Tolerances: +-.005. Tools required: 2 1/2" capacity multi-spindle screw machine. Prints and specifications on file at the Philadelphia office.

13-20-1: The government requires subcontracting facilities for the manufacture of a large number of miscellaneous small gun parts. All forgings to be furnished by prime contractor. Tolerances—precision work. Quantity to be based on monthly deliveries of 500 to 1,600 for indefinite period and production to start at once producing equipment for light milling, drilling, turning, and boring. Contract by negotiation. Prints and specifications are on file at the Philadelphia office.

16-21-1: A Philadelphia concern is looking for machining facilities to machine bar stock and forgings. Equipment needed—drill presses, lathes, threading machines, gear cutting machines. Drawings can be seen at this office.

16-21-2: A Pennsylvania manufacturer requires subcontracting facilities for bearing outer races. Material, to be furnished by prime contractor, is S.A.E. 52100 steel. Tolerance .003 mean and quantity 5,000 to 10,000 per month, production to start as soon as possible. Equipment desired: Capacity of four 16" Fay lathes with usual cam attachments for rough and finished turning of outer self-aligning bearing races.

16-20-1: A western Pennsylvania concern requests subcontracting facilities for machining heavy castings, requiring 8 x 30-foot stroke planer. Drawings and specifications at Philadelphia office.

16-20-2: A Midwestern concern is looking for forging facilities for several medium size straight shafts and crank shafts. Drawings and specifications at Philadelphia office.

2-17-1: A Pennsylvania concern requires subcontracting facilities for production of 75-mm. adapters. Material, to be furnished by the subcontractor, is WDX-1314; tolerance .010. Quantity required, 80,000 to 100,000 per month for six to nine months, commencing as soon as possible. Priority rating A-1-c or better. Tools necessary are multiple-spindle automatic screw machines, capacity, 2 1/4 to 3-inch and turret lathes for secondary operation.

**STRUCTURAL SHAPES .**

**SHAPE CONTRACTS PLACED**

13,500 tons, engineering projects, exports, to Harris Structural Steel Co., New York.

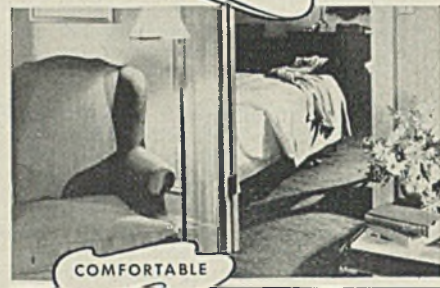
4000 tons, ordnance works in Minnesota, to be operated by E. I. du Pont de Nemours & Co., to Clinton Bridge Works, Clinton, Iowa (to be fabricated

**SHAPE AWARDS COMPARED**

	Tons
Week ended May 9	22,801
Week ended May 2	95,840
Week ended April 25	80,040
This week, 1941	29,710
Weekly average, 1942	32,710
Weekly average, 1941	27,373
Weekly average, April, 1942	54,510
Total, 1941	585,157
Total, 1942	588,782

Includes awards of 100 tons or more.

*This*  
**IS HOTEL  
CLEVELAND**



COMFORTABLE



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CONVENIENT



STEEL



by Four V Structural Steel Companies, Chicago).

- 1800 tons, addition, Henry Disston & Sons Co., Philadelphia, to Morris Wheeler & Co., Philadelphia.
- 1600 tons, eight mine sweepers, to Associated Shipbuilding Co.
- 880 tons, piling, locks, Sault Ste. Marie, Mich., to Inland Steel Co., Chicago.
- 461 tons, state highway underpass, Tulsa, Okla., to Patterson Steel Co., Tulsa, Okla.
- 230 tons, crane runway, Worthington Pump & Machinery Corp., Buffalo, to Lackawanna Steel Construction Co., Buffalo.
- 180 tons, building for Chase Brass & Copper Co., to Pittsburgh-Des Moines Steel Co., through Stone & Webster Engineering Corp., Boston.
- 150 tons, state bridge, Hartford, Conn., to American Bridge Co., Pittsburgh.

**SHAPE CONTRACTS PENDING**

- 1200 tons, naval storage warehouse in Pennsylvania, Morris Wheeler & Co., Philadelphia, low.
- 860 tons, transmission and river crossing towers, Fall River, Mass., abandoned for duration; Stone & Webster Engineering Corp., Boston, contractor.
- 250 tons, Tidal Basin bridge, Washington; Cleverock Construction Co., New York, only bidder.

**REINFORCING BARS . .**

**REINFORCING STEEL AWARDS**

- 1500 tons, sheet mill, Aluminum Co. of America, McCook, Ill., to Joseph T. Ryerson & Son Inc., Chicago; Henry Ericson Co., Chicago, and Harrison Construction Co., Pittsburgh, contractors; bids April 30.
- 1500 tons, floor slabs, tank parts plant, American Steel Foundries, to Ceco Steel Products Corp., Cicero, Ill.; Thorgersen & Ericksen Co., Chicago, contractor.
- 800 tons, lens plant, Bell & Howell Co., Lincolnwood, Ill., to Joseph T. Ryerson & Son Inc., Chicago; Dahl-Stedman Co., Chicago, contractor.
- 455 tons, Bureau of Reclamation, invitation C-46,442-A, Kremling, Colo., to Colorado Fuel & Iron Corp., Pueblo, Colo.
- 206 tons, Bureau of Reclamation, invitation B-33,125-A, Coram, Calif., to Laclede Steel Corp.
- 190 tons, expansion, Crowe Name Plate & Mfg. Co., Chicago, to Bethlehem Steel Co., Bethlehem, Pa.; S. N. Nielsen Co., Chicago, contractor.
- 177 tons, Bureau of Reclamation, invitation B-33,124-A, Coram, Calif., to Laclede Steel Corp.
- 152 tons, miscellaneous construction, naval reserve aviation base, to Bethlehem Steel Co., Bethlehem, Pa.; Sherry-Richards Co., Chicago, contractor.

**CONCRETE BARS COMPARED**

	Tons
Week ended May 9	4,980
Week ended May 2	48,276
Week ended April 25	16,562
This week, 1941	8,965
Weekly average, 1942	10,932
Weekly average, 1941	13,609
Weekly average, April, 1942	22,105
Total, 1941	220,149
Total, 1942	196,784

Includes awards of 100 tons or more.

**REINFORCING STEEL PENDING**

- 1250 tons, Bureau of Reclamation, invitation B-33,131-A, Coram, Calif.; Republic Steel Corp., Cleveland, low.
- 250 tons, access highway, to navy yard, Brooklyn; bids to borough president, May 12, priority A-1j.
- 202 tons, Bureau of Reclamation, invitation B-33,126-A, Coram, Calif.; no bids received.

**RAILS, CARS . . .**

**CAR ORDERS PLACED**

Phelps, Dodge Corp., 190 ninety-ton ore

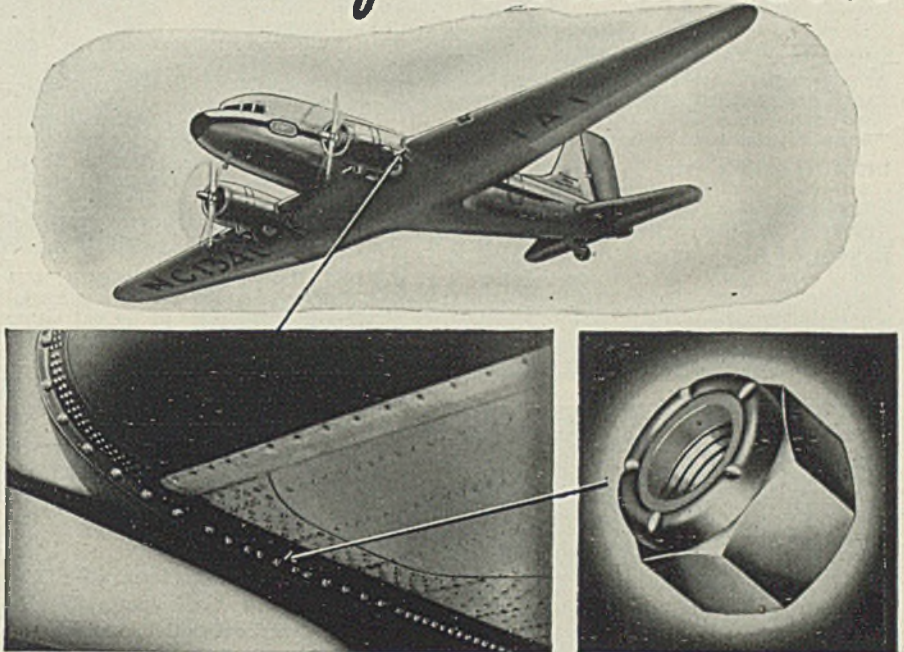
cars; reported placed with Austin-Western Co., Aurora, Ill.

**BUSES BOOKED**

A.c.f. Motors Co., New York: twenty-three 33-passenger for Southeastern Greyhound lines, Lexington, Ky.; five 41-passenger for Boston Elevated Railway, Boston; five 41-passenger for United Electric Railways Co., Providence, R. I.; three 28-passenger for Conestoga Transportation Co., Lancaster, Pa.; three 41-passenger for Worcester Street Railway Co., Worcester, Mass.; two 41-passenger for Eastern Massachusetts Street Railway Co., Boston; one 41-passenger for Rapid Transit Inc., Saugus, Mass.

J. G. Brill Co., Philadelphia: Six 40-passenger trolley coaches for Delaware

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Elastic Stop Nuts hold the wings to the fuselage, on all Douglas DC Series Transport Airplanes. This is but one of the many Elastic Stop Nut applications on these famous ships.

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REG. U.S. PAT. OFF.



Electric Power Co., Wilmington, Del.; five 40-passenger trolley coaches for Wilkes-Barre Railway Corp., Wilkes-Barre, Pa.

## PLATES . . .

### PLATE CONTRACTS PLACED

1000 tons, 24 petroleum tanks, Des Moines, Iowa, for United States engineer's office, Chicago, to General American Transportation Corp., Chicago; bids April 20.

## CONSTRUCTION AND ENTERPRISE . . .

### Michigan

ANN ARBOR, MICH.—Douglas D. Loree, Ann Arbor architect, is preparing plans for addition to plant of American Broach & Machine Co., Ann Arbor.

ANN ARBOR, MICH.—Economy Baler Co., Ann Arbor, is having plans prepared by Douglas D. Loree, architect, for plant addition.

DETROIT—Godin Tool & Die Co. has awarded contract to Cooper Construction Co., Detroit, for erection of factory costing \$84,000.

DETROIT—National Tool Salvage Co., 3816 Beaubien, will erect factory, on which bids are being taken by Barton D. Wood Co., 2830 East Grand boulevard.

## PIPE . . .

### CAST PIPE PLACED

383 tons, 8-inch, San Francisco, to United States Pipe & Foundry Co., Burlington, N. J.

### CAST PIPE PENDING

17,451 tons, 36 to 48-inch cast iron or welded steel pipe, pipe line, Defense Public Works, San Diego, Calif.; bids May 12.

215 tons, 16-inch, east bay municipal utility district, Oakland, Calif.; bids May 6.

Albert E. Abbott, 4389 Martin avenue, Cleveland.

DETROIT—Racoda Engineering Inc., 550 Maccabees building, Detroit, has been organized to do general engineering and tool designing. Correspondent: Frank Coulson, 10 Tiverton road, Bloomfield Hills, Mich.

DETROIT—Roberts Machine Products Inc., 1250 Penobscot building, has been incorporated to manufacture tools and machinery. Leslie E. Roberts, 5572 Wayne road, Wayne, Mich., correspondent.

FERNDALE, MICH.—Kroetke Tool Co., Ferndale, has let contract to Robert Tillotson, Bloomfield Hills, for factory and office building.

FERNDALE, MICH.—Suprex Gage Co., Ferndale, has let contract to J. A. Utley, Detroit, for factory building.

FERNDALE, MICH.—Cunningham-Rudy Co., Detroit, has contract for \$62,000 building here for Reichhold Chemicals Inc. Giffels & Vallet Inc., Detroit, architects.

GRAND RAPIDS, MICH.—Owen, Ames & Kimball, Grand Rapids, have been given contract for addition to plant of Haskellite Mfg. Co. here.

GRAND RAPIDS, MICH.—McInerney Spring & Wire Co., Grand Rapids, has awarded contract to Owen, Ames & Kimball, Grand Rapids, for \$25,000 addition to its plant.

HANCOCK, MICH.—Great Lakes Machine Works Inc. has been organized with \$50,000 capital to do general manufacturing. Correspondent: Theodore Messner, Houghton, Mich.

HILLSDALE, MICH.—H. R. Graf, architect, 308 Reynolds building, Jackson, Mich., has prepared plans for manufacturing plant here.

KALAMAZOO, MICH.—Louis Kingscott & Associates Inc., Kalamazoo architects, preparing preliminary survey for manufacturing plant and power house in Battle Creek, Mich.

MANISTIQUE, MICH.—Manistique Tool & Mfg. Co., South Chippewa avenue, has been organized to manufacture tools. Correspondent: Frank LeMaire, Hlawatha, Mich.

PONTIAC, MICH.—Ray W. Ward, Pontiac architect, is preparing plans for factory addition.

PONTIAC, MICH.—Work on addition to Yellow Truck & Coach Co.'s plant here has been started. Estimated cost \$386,000.

ROYAL OAK, MICH.—Carbide Fabricators Division of Morse Tool Co., Royal Oak, has let contract to E. J. Swink, Detroit, for factory here. Estimated cost \$65,000. Earle W. Shaffer, Detroit, architect.

SAGINAW, MICH.—J. R. Heineman & Sons, Saginaw, have been awarded general contract for factory and boiler house here for Wilcox-Rich Division of Eaton Mfg. Co.

### New York

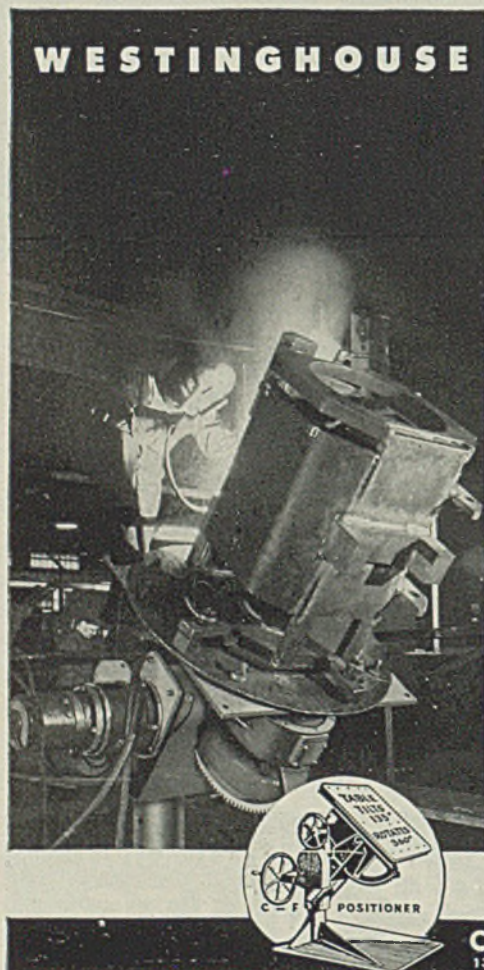
WESTFIELD, N. Y.—Arrow Tool & Equipment Co. will spend about \$40,000 for 60 x 90-foot plant addition and equipment.


### New Jersey

CAMDEN, N. J.—Camden Machine Tool Works Inc. has been incorporated at Trenton, N. J., with \$150,000 preferred and 1000 common shares of stock.

NEWARK, N. J.—New Jersey Galvanizing & Tinning Works will soon let contract for one-story, 165 x 177-foot plant. V. Strombach, 1243 Springfield

# WESTINGHOUSE





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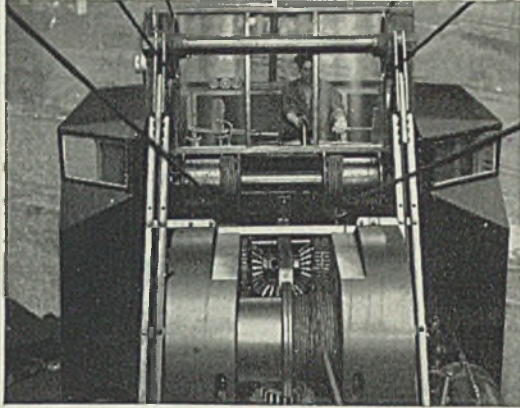
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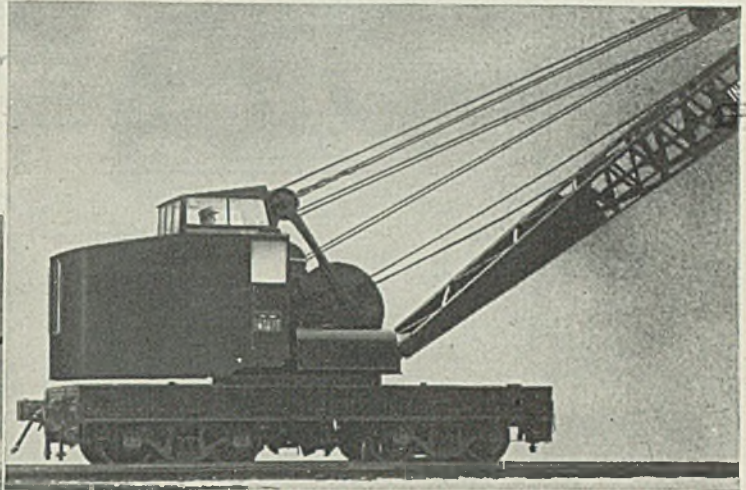
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Cranes from 10 thru 40 tons capacity. It assures clear visibility in all directions and it increases the operator's comfort and efficiency by reducing heat and noise and improving ventilation.



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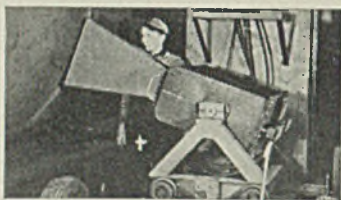


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**GENERAL AMERICAN  
TRANSPORTATION**  
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In All  
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avenue, Irvington, N. J., architect.

**NEW BRUNSWICK, N. J.**—North Brunswick township committee will spend about \$200,000 for additions to sewage treatment plant.

**PLAINFIELD, N. J.**—Somerset Machine & Tool Co., 246 East Second street, has awarded contract to Carl S. Roller-son Inc., 620 Stelle avenue, for machine shop addition.

**UNION, N. J.**—Wadell Engineering Co., 358 Mulberry street, Newark, N. J., has let contract for 120 x 160-foot plant to K. Vogelsberg, 9 Olive street, Newark. Estimated cost \$55,000.

### Ohio

**CINCINNATI**—An addition will be built to the Tool Steel Gear & Pinion Co. plant on Township avenue, Elmwood place.

**CINCINNATI**—Navy Department has authorized announcement of plans to build an addition, containing 40,000 square feet of space, to be occupied by American Tool Works Co., L. W. Scott Alter, president and general manager.

**CLEVELAND**—National Tool Co., L. A. Schmidt, vice president and chief engineer, 11200 Madison avenue, plans new plant to increase production of milling cutters, special tools and gear cutters.

**CLEVELAND**—Merit Machine Co. is being organized by William Lockhart, F. J. Kusta and R. W. Ball to take over business of Merit Machine Tool & Container Co., 3860 East Ninety-first street. Mr. Lockhart, president of the latter firm, will head the new one.

**CLEVELAND**—John M. Peters, contractor, 8805 Madison avenue, expects to start work as soon as priority is obtained on \$30,000 defense plant.

**CUYAHOGA FALLS, O.**—Reimer & Bloomgren Machine Works, 2746 Second street, is adding 800 square feet to machine shop.

**PAINESVILLE, O.**—Chrome Service Inc., newly organized, will take over business formerly solely-owned by T. J. Clancy, 265 East Erie, and will continue to operate the plant at 407 Elm street.

**YOUNGSTOWN, O.**—General Fireproofing Co., W. H. Foster, chairman of the board, East Dennick avenue, is re-tooling portion of plant to make additional airplane parts.

### Pennsylvania

**BOYERTOWN, PA.**—Eastern Foundry Co. has plans by A. S. Kepner, Pottstown, Pa., for one-story plant addition costing \$40,000, including equipment.

**GROVE CITY, PA.**—Cooper-Bessemer Corp., B. B. Williams, president, Mount Vernon, O. is doubling diesel engine production here by erection of two buildings and installation of equipment. Project is financed under plant facilities contract by the Bureau of Ships, Navy Department.

**KUTZTOWN, PA.**—Kutztown Foundry & Machine Co. has asked bids for one-story plant addition costing \$50,000.

**SPRING VALLEY, PA.**—Bowers Battery Mfg. Co. has awarded contract for one-story plant addition. Estimated cost \$40,000, including equipment.

**WILKES-BARRE, PA.**—W. H. Nicholson & Co. has plans by Lacy & Atherton, Forty Fort, Pa., for two-story plant addition. Cost \$40,000 with equipment.

### Illinois

**CHICAGO**—Reliable Screw Machine Prod-

ucts, 3146 West Lake street, is constructing building at a new location to house the company's operations.

**CHICAGO**—Diebell Die & Mfg. Co., 3654 North Lincoln avenue, has incorporated a subsidiary, the DI Machine Corp., to build a new type high-speed punch press.

**CHICAGO**—Selaky Corp., 11001 Cottage Grove avenue, is constructing plant at Cicero avenue and Sixty-seventh street. Move to new quarters will be effected in September.

**CHICAGO**—Midland Machinery Corp., 515 West Thirty-fifth street, has begun construction of one and two-story addition to cost \$500,000.

**CHICAGO**—Mall Tool Co., 7740 South Chicago avenue, is making a major ex-



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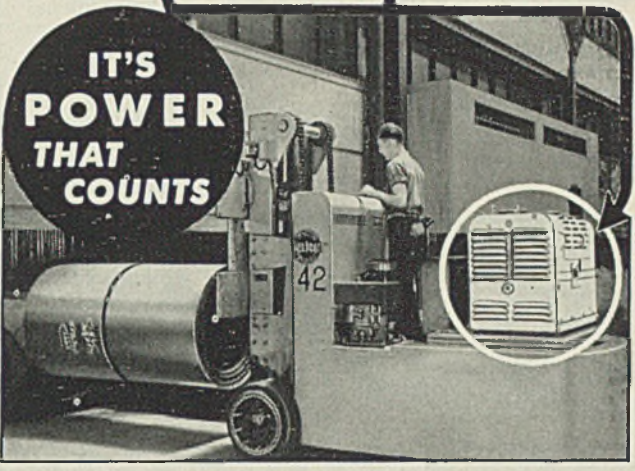
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**IN THE CENTER OF MID-TOWN NEW YORK**

M-272



pansion to its plant.

CHICAGO—Carbide Tool Co., 816 North Kostner avenue, is erecting building adjacent to present plant.

CHICAGO—Victor Adding Machine Co., 3900 North Rockwell avenue, is expanding present buildings and soon will erect a new building, the program to more than double manufacturing space.

CHICAGO—Gregory Electric Co., 2630 South Wabash avenue, is expanding its manufacturing and assembly space.

CHICAGO—Goodman Mfg. Co., 4834 South Halsted street, will take bids soon for one-story assembly plant costing \$40,000. Mundle, Jensen,

Bourke & Havens, 39 South LaSalle street, architects.

GENEVA, ILL.—Burgess-Norton Mfg. Co. is building plant near here for production of army ordnance. Plant will contain 100,000 square feet of space.

**Indiana**

ELKHART, IND.—Foster Division of International Machine Tool Co. will spend approximately \$50,000 for plant addition and equipment.

**Maryland**

BALTIMORE—Mullan Contracting Co., 3945 Greenmount avenue, has contract for addition to building at 2315 Home-

wood avenue for Rowan Controller Co.

**Tennessee**

MEMPHIS, TENN.—International Harvester Co., 180 North Michigan avenue, Chicago, has acquired a 260-acre tract near here for erection of farm machinery manufacturing plant. Estimated cost \$5,000,000.

MEMPHIS, TENN.—Caine Steel Co., L. J. Caine, president, 1820 North Central Avenue, Chicago, has acquired 18 acres at Weakley and North Seventh streets, here, for erection of steel fabricating plant.

MEMPHIS, TENN.—Pidgeon-Thomas Iron Co., 107 East Iowa avenue, has building permit for construction at its plant.

**Florida**

SEBRING, FLA.—City will construct \$132,710 power plant; FWA furnishing \$65,000.

**West Virginia**

HUNTINGTON, W. VA.—International Nickel Co., Robert C. Stanley, president, Guyan River road, plans \$3,000,000 expenditure for producing special material.

**Missouri**

ST. LOUIS—W. C. Harting Construction Co., 722 Chestnut street, has contract for addition to factory for Machinery & Welder Corp., 700 South Spring avenue.

**Wisconsin**

MILWAUKEE—Louis Allis Co. is erecting an addition to its plant. E. J. Shrang is architect, and H. Danischefsky, contractor.

MILWAUKEE—Milwaukee Tool & Die Co., 3411 West Hopkins street, has asked bids for 85 x 120-foot factory. M. F. Pfaller, 8525 Ravenswood Circle, Wauwatosa, Wis., architect.

**Minnesota**

MINNEAPOLIS — Pioneer Engineering Works, L. W. Yerk, president, 1515 Central avenue, has let general contract for one-story 60 x 80-foot and 60 x 120-foot factory additions to D. L. Wlitcher, 1253 Cedar Lake road. Estimated cost \$40,000.

**Nebraska**

SIDNEY, NEBR. — Consumers Public Power district, W. P. Venable, district manager, plans power plant addition, including diesel generating unit, transformer substation, etc. Estimated cost \$96,000.

**Texas**

AMARILLO, TEX.—City, A. P. Hancock, city manager, has applied for FWA funds for outfall sewer and treatment plant. Estimated cost \$1,261,679. W. T. Hazelwood, engineer.

BAY CITY, TEX.—City has Presidential approval for water facilities costing \$130,000.

DENISON, TEX.—United States engineer office will take bids May 15 for furnishing material and labor for design, manufacture and delivery of one 225-ton overhead traveling crane, delivery f.o.b. railroad cars at power house.

GARLAND, TEX.—City has Presidential approval for \$157,592 water and sewage improvements.

KINGSVILLE, TEX.—City has applied for FWA funds for water and sewer

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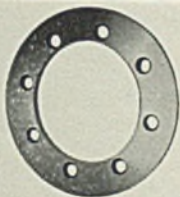
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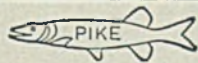
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Flash-O-Lens

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*H. H. Seaman*

President & General Manager

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improvements, costing \$39,000. Peurifoy & Patterson, Box 1321, engineers.

PORT ARTHUR, TEX.—Texas Co., Houston, Tex., will soon award contract for lubricating plant here to cost \$2,500,000 with equipment.

WICHITA FALLS, TEX.—City has Presidential approval of water supply addition, costing \$206,000.

#### Iowa

CHARLES CITY, IOWA—Oliver Farm Equipment Co. will erect 65 x 350-foot factory. Estimated cost \$40,000.

#### Montana

BUTTE, MONT.—Montana Power Co. has applied to federal power commission for permit to construct 50,000-horse-

power hydroelectric plant, including dam and powerhouse.

#### California

LOS ANGELES—Kullmann Iron & Wire Works, 1260 East Fifty-seventh street, has been organized by Karl and Esther Kullmann.

TORRANCE, CALIF.—B. & R. Machine Works has been organized by Roland H. Wilcox and Foster C. Rice.

VERNON, CALIF.—Aluminum Co. of America, 5151 Alcoa avenue, Vernon, is erecting several additions to its plant here.

VERNON, CALIF.—United States Spring & Bumper Co. will erect an addition, 75 x 260 feet, to its plant here. Estimated cost \$30,000.

#### Canada

FALCONBRIDGE, ONT.—Falconbridge Nickel Mines Ltd., 25 King street West, Toronto, N. S. F. Parkinson, secretary-treasurer, will spend about \$600,000 on plant enlargements, chiefly blast furnace installations, to be installed by Canadian Allis-Chalmers Ltd., 212 King street West, Toronto.

HAMILTON, ONT.—Perga Containers Ltd., Main street West, has given general contract to W. H. Cooper Construction Co. Ltd., Medical Arts building, for plant addition to cost \$25,000, with equipment. Prack & Prack, Pigott building, architects.

NAPANEE, ONT.—Lennox Lumber Co., whose plant was destroyed by fire, will rebuild at cost of about \$50,000, including equipment.

TORONTO, ONT.—International Resistance Co., 187 Duchess street, will let contracts soon on plant addition to cost about \$40,000 with equipment.

TORONTO, ONT.—Coulter Mfg. Co. Ltd., Oshawa, Ont., will erect 20 x 60-foot plant addition to cost \$25,000 with equipment.

TORONTO, ONT.—International Business Machines Co. Ltd., 36 King street East, has started preliminary work on plant addition at 300 Campbell avenue. Dickle Construction Co. Ltd., 17 Yorkville avenue, has general contract. Cost estimated at \$30,000 with equipment.

TORONTO, ONT.—Ferguson Tool Salvage Ltd., 349 Carlaw avenue, has plans and will let contracts soon for plant on Eastern avenue to cost about \$30,000 with equipment.

WELLAND, ONT.—Buffwell Engineering & Machine Co., 201 Major street, has let general contract to Gardner Construction Co. for plant addition, to cost with equipment about \$25,000.

DRUMMONDVILLE, QUE.—Canadian Celanese Ltd., 1401 McGill College avenue, Montreal, J. L. Killoran, chief engineer, is having plans prepared for plant addition to cost about \$250,000 with equipment.

LATUGUE, QUE.—Brown Corp. Ltd., 71 St. Peter street, Quebec, Que., has given general contract to John Wickenden, 363 St. Francois Xavier street, Three Rivers, Que., for plant addition to cost \$150,000. Contractor will purchase equipment and machinery to cost about \$400,000.

LONGUEUIL, QUE.—City, Denis Viger, secretary-treasurer, is receiving bids for filtration and pumping plant buildings to cost about \$100,000, equipment extra. Adrien Plamondon, 369 Mount Royal avenue West, in consulting engineer.

MONTREAL, QUE.—Canadian Vickers Ltd., 5136 Notre Dame street East, has given general contract to L. G. Oglvie & Co. Ltd., 2228 Walker avenue, for aircraft plant at Cartierville, to cost with equipment about \$3,000,000.

MONTREAL, QUE.—Fairchild Aircraft Ltd., Longueuil, is receiving bids through T. Pringle & Son Ltd., 485 McGill street, for further addition to plant to cost \$100,000.

MONTREAL, QUE.—Climax Co. Ltd., 795 Versailles street, has given general contract to H. C. Johnston Co. Ltd., 1502 St. Catharine street West, for plant addition to cost about \$50,000, with equipment.

SHAWINIGAN FALLS, QUE.—Allied War Industries, under direction of Department of Munitions and Supply, Ottawa, H. H. Turnbull, secretary, is considering plans for erection of plant here to cost about \$100,000.

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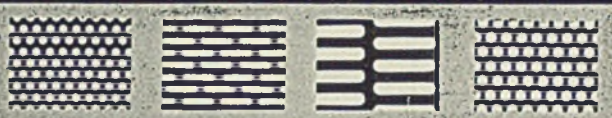
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