

Balors antiaircraft gun production multiplied at Chrysler Corp. plants, p. 54

C O N T E N T S

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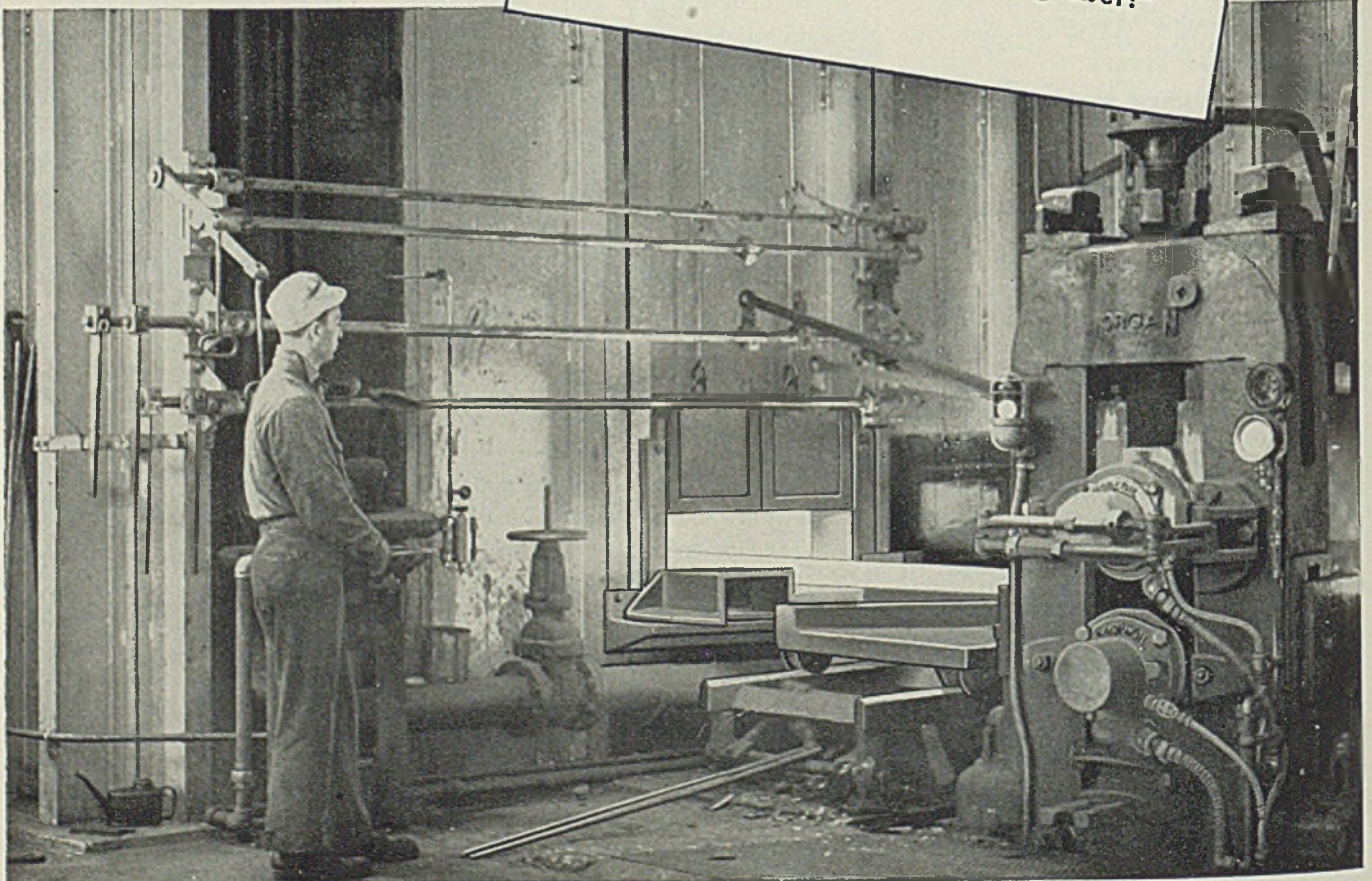
**Every 20 seconds
I start a mile
of rod!**

"Sure I'd like to get in the fight with
a gun in my hands . . .

"But then I get to thinkin' . . .
maybe I'm in the fight right here,
working this switch. Every 20 sec-
onds I start a mile of rod . . . that's
about 173 miles of rod an hour . . .
good for around 84,000 miles of
barbed wire every week!

"Match that one, Schicklgruber!"

R-105



MORGAN CONSTRUCTION COMPANY • WORCESTER, MASS.

HIGHLIGHTING

this issue of **STEEL**

PRODUCTION Steel ingot production last week continued unchanged at 98 per cent of capacity (p. 39). The scrap outlook continues serious. Despite the record shipments of lake iron ore this summer attention is being given to the possible bringing down of ore over the winter months (p. 38). Shortly there will be more new blast furnaces to feed (p. 117).

Lou E. Holland, chairman of the Smaller War Plants Corp., now also serves as deputy chairman of the Smaller War Plants Division of WPB (p. 48). His task is to get smaller plants into production and keep them in production, either on war work or essential civilian products.

To keep copper, lead and zinc workers in Idaho and Utah from migrating, the War Labor Board recommends their pay be increased \$1 a day (p. 36). Paul McNutt asks for necessary legislation for mobilizing our manpower completely.

Scott D. Baumer discusses steel mill maintenance with a view to preventing or reducing repair shut-down periods (p. 70).

As an example of production out of balance: Ternstedt Division is three months ahead in making Sperry gyro horizon and directional gyro indicators (p. 51).

PRIORITIES Latest pinch in the steel supply is in bars, particularly large rounds and flats. Deliveries on bars with highest ratings range from three to four months (p. 117). WPB plans further tightening of metal controls (p. 48). An allocation system is to be applied to hot-rolled bars for cold finishers.

PROTECTION V. Gilmore Iden finds that structures fully framed with steel resist bomb blasts to an amazing degree (p. 66). An air raid protection system for steel plants is outlined by the American Iron and Steel Institute (p. 59).

CONSERVATION British Standard War Emergency Specification No. 1030 replaces high tin bronzes with compositions free of tin or containing less tin; silicon bronzes serve in many purposes (p. 76). American consumers report desirable results through using NE steels (p. 117). Members of the steel mission to England have reported to Donald M. Nelson but the findings have not been made public (p. 35).

Tool Division has asked armed services to see that all unused and surplus tooling now in the hands

of contractors be sent back to the builders so they may be placed in service. The Tools Division is encouraging salvage of cutting tools; it is forcing the procurement agencies to prove their needs (p. 47).

The problem of keeping steel warehouses stocked has not yet been solved. To prevent duplication, many small stocks throughout the country may have to be wiped out (p. 46).

Copper chemicals are under allocations (p. 43). Production of metal doors is under prohibition (p. 43).

SAFETY An effective program for saving eyes reduces accidents, increases production and creates good will (p. 64).

NICKEL PLATING F. P. Romanoff, in discussing nickel electrodeposits, shows how to produce deposits for any particular purpose by altering conditions to give the desired characteristics (p. 86).

WESTERN STEEL J. R. Mahoney analyzes the economics of making iron and steel and gives reasons to support his belief that the expanded steel industry in the West is on a sound basis from a long-range point of view (p. 79).

PRICES Steel resellers now are under OPA licensing control; licenses may be suspended for price ceiling violations (p. 60). New ceilings on rejected rolled steel sections are 15 to 35 per cent below prices previously obtained for such materials.

MISCELLANEOUS Reversing the normal flow, Canada now is shipping machine tools to the United States (p. 58). Coveted Army-Navy "E" pennant has been awarded to some 30 additional plants (p. 56).

Thompson Products Inc. is using a new sound-film to better acquaint employes with their jobs. as well as to create good management-employe relations (p. 57).

Construction of a North Carolina-Virginia oil pipe line has been approved (p. 37). Railroads will need 80,000 new freight cars in 1943 (p. 37). Information leaking out of Europe indicates that industry there is suffering acutely from the strain of war (p. 34).



The freighter L. E. Block, unloading ore at the Indiana Harbor works of Inland Steel Co. Capt. Kizer on the bridge.

Inland Fleet Breaks Records

Carrying Ore to the Mills for War Production

Every freighter of the Inland Steel Co. fleet has broken its all-time cargo-carrying record since the opening of spring navigation. The L. E. Block, flagship of the fleet, recently docked with 16,369 tons of iron ore—a new tonnage record for the Inland freighters. By the end of August the L. E. Block already had made 23 round trips—seven of which set new tonnage records.

This performance of the Inland fleet is in answer to the tremendous wartime demand for steel. Not only must enough ore, limestone and coal be

delivered at Indiana Harbor to maintain present above-capacity ingot production—but enormous additional tonnages must be put in huge stock piles for ready use during the long winter months when navigation is closed on the Great Lakes.

The men who sail the Inland lake freighters, like the men who tend the Inland furnaces and rolling mills, are working day and night to do their part in winning the war. They will bring down more ore—make more steel—until those who threaten liberty have been conquered.

SHEETS • STRIP • TIN PLATE • BARS • PLATES • FLOOR PLATE • STRUCTURALS • PILING
RAILS • TRACK ACCESSORIES • REINFORCING BARS

*Dedicated
to Victory*

INLAND STEEL CO.

Glory Enough For All

Ceremonies attending the award of the Army-Navy "E" for excellence in performing war contracts afford many industrial companies unusual opportunities for promoting good public and labor relations.

While the programs of most of these events conform to a standard pattern, visitors who attend dozens of these ceremonies every month notice that there is a marked difference in the emphasis placed upon those whose work contributed to the winning of the award. At some ceremonies, the part management played in the company's achievement seems to be overstressed, sometimes to the extent of minimizing the importance of the contributions of the employes. In other instances the reverse is true; undue emphasis seems to be placed upon the employes.

Of course the impression an outsider gains from one of these events depends somewhat upon how the program is stage-managed. Nevertheless, a keen visitor usually can sense whether a company is gaining or losing employe and community good will as a result of the manner in which the award ceremony is handled.

No company can go wrong if, in planning the details of the program, its officers give special attention to the over-all effect of the ceremony upon every element in the personnel of the company. It should be remembered that the award is a recognition of merit and that it has been won by teamwork. Therefore the award should be accepted in a way that will cause every member of the team to feel that his or her contribution has been recognized.

There is enough glory in an Army-Navy "E" award to go around. The company whose officers go to some pains to see that it does go around—that it is distributed equitably—will be rewarded not only with an improved spirit of teamwork within the plant but also a larger measure of good will in the community.

E. L. Shaner

Editor-in-Chief

Continent Shows Strain of War After Three Years

RAF bombings, sabotage weakening structure of Europe's munitions industry. Transport system a vulnerable spot. Fuel shortage is critical. Germans reorganizing steel industry

By J. A. HORTON
British Correspondent, STEEL

LONDON

THREE years of total war have had a profound effect on the supply situation. Destruction on so vast a scale requires replacements at a rapid rate, and poses great difficulties. However, there is plenty of evidence that the United Nations are producing more materials than ever before and are building up reserves of munitions of every kind to insure the defeat of the Axis powers.

Information leaking out from Germany and occupied countries indicate the Continent's industry is showing the strain of war, of which raids by the United Nations' air forces and sabotage are playing an important part.

Recently announced by Germany was a reorganization scheme which is to become effective Oct. 1. It has been planned by the new Reichsvereinigung Eisen which takes over the duties of the former Reichstelle Eisen und Stahl

which has hitherto allotted quotas and will now be dissolved. The plans include the relevant economic areas in the occupied territories and in the Protectorate of Bohemia and Moravia.

Everything will be done to increase ultimate productivity, economy in labor and transport. The changeover, however, will take some time. Herman Roechling, the head of the new concern, in a recent statement declared that it would interest itself in the question of quality of products, although the main object would be to provide the maximum quantity.

Steel Shortage May Be Serious

This development shows that the strain of war has made reconstruction necessary. The emphasis on the economy of iron and steel speaks for itself. The proposed research drive suggests that the shortage of vital materials may

have become serious in the Fatherland.

Furthermore, however much Hitler's henchmen may seek to belittle the activities of the R.A.F., Germany's industrial areas are being subjected to a severe hammering which slowly but surely is having its effect. Recent R.A.F. raids on the Ruhr are reported to have caused serious damage to the main buildings of the Thyssen works. They were hit in March last. Five other steelworks in the Hamborn-Duisburg-Ruhrort area have also been damaged. Works and warehouses in other parts of the Ruhr have suffered and photographs taken by British observers confirm the view that output will be seriously affected.

A new German scrap campaign has been started. According to a German language newspaper published in London this campaign is not due to any lack of domestic iron ore supplies (since Germany commands extensive deposits within her military frontiers) but to the shortage of coke and the difficulties of transporting ore to the smelters.

Use of scrap on a more extensive scale will reduce the amount of coke needed to produce the same tonnage of steel and will also assist the transport situation. The scrap drive was started soon after the Saar industrialist, Roechling, was appointed head of the new Reichsvereinigung Eisen. The Saar steelworks, like those of Lorraine and Luxembourg, have recently only been partly utilized; these works are dependent on supplies of coke from the Ruhr, but the Ruhr mines have declared that they are unable to supply sufficient coke. Roechling probably hopes by this means to get the Saar works fully incorporated in the German war effort.

Using France's Raw Materials

As far as possible Germany is making use of plant in the occupied lands, but France is said to be suffering from a shortage of coal, iron and steel, non-ferrous metals, motor fuel and many other raw materials. Some 1300 French factories have been shut down. However, the Germans are endeavoring to insure that as much as possible of France's limited raw materials are used for their war machine and it is said that the German central buying office in Paris has lost interest in French manufacturers who do not possess stocks of such materials and are placing contracts with those that have.

Under German pressure French restrictions on the use of certain materials are generally waived. Most of the works which have shut down are doubtless those which are not useful to the Germans. Since the armistice, French industry has been working only at an



Despite violent German attacks, Russian soldiers are able to hold their positions because of reinforcements sent up from the rear. Shown is an underground factory producing munitions in a city that has suffered heavy bombing attacks. NEA photo

average rate of 30 to 40 per cent of capacity and now that the raw materials position is worsening this percentage is falling further. Laval has agreed to send many thousands more French workers into Germany and Marshal Petain last week signed a "Slaves of Hitler" law establishing the principle of forced labor and total dictatorship over employment.

Not only is German industry suffering from British air raids. Reports come from Belgium that there too, in the industrial region of Liege, famous for steel and ironworks, the overhead runways of the Cockerill collieries and blast-furnaces have been destroyed. Work was considerably slowed down in consequence as it became impossible to remove the stones and slag.

Incidents occur which show the strong undercurrent of feeling which is rising against the usurpers. At Ruysbroeck, an industrial center south of Brussels, an electric power station has been destroyed by an explosion caused by sabotage. According to statements made by inhabitants of Liege who escaped from Belgium and have reached Great Britain, sabotage is practiced on a large scale at the Fabrique National works. Firearms and ammunition are continually being stolen and handed over to secret organizations.

In Belgium the Germans have demanded that 230 locomotives should be overhauled. The Belgian railways now receive only a third of the oil required for the maintenance of sufficient rolling stock for the present traffic. Because of

this, the material is rapidly wearing out.

Another report comes from Charleroi that in the "La Providence" works there the largest rolling-mill has been destroyed by a bomb. Consequently work has been suspended for a long period.

Sweden has been suffering from a fuel shortage in the iron and steel industries, whose normal coal requirements are about 700,000 tons annually. To about 60 per cent it has been possible to substitute wood fuel for coal, but this has been no easy matter. The furnaces of Swedish iron and steel works have generally been designed for coal or oil firing, and extensive alterations have had to be made to adapt them for wood burning.

Swedish pig iron production is largely based on coke. Large stocks of coke were laid in by the State Reserve Supply Board at the beginning of the war. Pig iron production, therefore, has been maintained better than might have been expected.

In normal times Sweden exports considerable quantities of high-grade steel, while at the same time large quantities of structural and mild steel are imported (in the years before the war 450,000 tons annually). Only a part of this quantity can now be obtained from abroad, and the Swedish works have to supply the deficiency, thus turning out considerably more steel of ordinary grades than in normal times.

Much has been done in England during the past year to cut nonessential manufactures requiring metals. Concentration has been effected in the steel

trade and now is being extended to the iron foundry trade. Obtaining raw materials for other than war work has become increasingly difficult.

American Steel Mission Returns From England

Members of the American mission returned to Washington last week. Chairman of the delegation was Charles R. Hook, president, American Rolling Mill Co., Middletown, O. Other members were: Paul F. Shucker, chief of the lend-lease and import section of the WPB Iron and Steel Branch, Washington; Lieut. Col. Paul P. Llewellyn, United States Army; Capt. G. A. Duncan, United States Navy; Walter S. Tower, president, American Iron and Steel Institute; Earl C. Smith, chief metallurgist, Republic Steel Corp., Cleveland.

In England, the mission studied:

Ways to increase total production of steel in the United States and Great Britain.

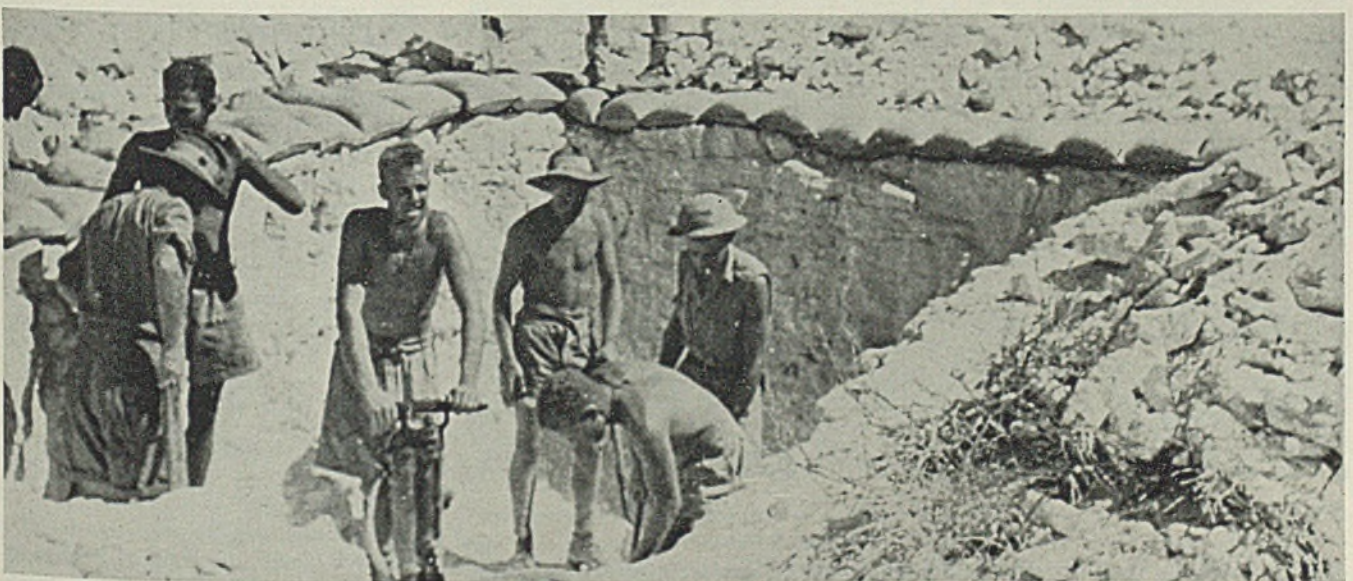
The British system for control of steel production, allocation and distribution.

How the steel programs of the two nations can be brought into better balance so that plates, shapes, structural steel, and so on, will all be produced in the proper ratio.

Whether increased production and savings in shipping space can be effected by sending more ingot steel and less finished weapons to Britain or vice versa.

What steel products can best be made in the United States and what can best be made in Britain.

PNEUMATIC DRILL HELPS AUSSIES DIG IN



PNEUMATIC drill to break rock formations hastens the work done by Australian soldiers digging in on the Alamein front. NEA photo, passed by censor

Sweeping Control Over Manpower In Legislation Demanded by McNutt

LEGISLATION to attain full utilization of the nation's manpower is "inevitable," Paul V. McNutt, chairman, War Manpower Commission, told the House Migration Committee last week.

There is "good reason to doubt" whether voluntary agreements between the government and management and labor "will long be adequate," Mr. McNutt told the committee.

"We are moving rapidly into a situation where the government must intervene in the labor market.

"It is unlikely that we shall be able to avoid the controls over manpower which our Allies have found necessary."

Mr. McNutt's assertion that government control over manpower was necessary came after he reported that serious labor shortages existed in 35 of the coun-

try's war production centers.

He complained of an unnecessary migration of labor, of labor pirating, and of discrimination in many areas against women and minority groups.

Between now and the end of 1943, the war program will require the placing of 18,000,000 workers in new jobs, according to Mr. McNutt. Eleven million must be trained for semiskilled jobs.

"The period of easy expansion of employment is about over," he said, adding that before the end of the year unemployment in this country would be reduced to about 1,000,000.

"Lost motion in labor and seasonable unemployment must be eliminated," he asserted. By the end of next year, there will be an increase of 18 per cent in the output of the individual worker, due to

greater efficiency and lengthening of hours.

Mr. McNutt told the committee it was not yet certain how soon the commission would recommend national service legislation to the President, nor was the pattern of such legislation determined. Representatives of labor and management will be consulted before any action is taken, he said.

No conflict exists between the commission and the War Production Board as to the method of utilizing the country's manpower most effectively, Mr. McNutt said.

"We have 150 years of thinking in this country that the only place in time of war is in the Army," he asserted, explaining that if the war effort is to be adequately maintained full use must be made of available labor by persuading workers to remain at industrial jobs or taking such work.

"Every person will have to serve where he will best serve the country."

Mr. McNutt cited the following as areas where the labor shortage is most acute:

- Philadelphia: 100,000 workers needed.
- Detroit: 90,000 needed.
- Seattle: 78,000 needed.
- Portland-Tacoma: 55,000 to 75,000 needed.
- Baltimore: 59,000 needed.
- Buffalo: 45,000 needed.

The War Manpower Commission has been delegated authority to regulate and control transfers of government employes into direct war work. Employes thus transferred are guaranteed re-employment in their former, or similar positions, after the war is over.

NWLB Recommends Wage Raise To Prevent Migration

Dollar-a-day wage increase for 10,000 copper, lead and zinc workers in Idaho and Utah to check migration to higher-paying industries has been recommended by a majority of a National War Labor Board panel.

Dealing separately with ten plants of the American Smelting & Refining Co., involving an additional 4000 workers, the panel recommended increases ranging from 20 cents to \$1.24 a day in seven of them and suggested negotiations for the other three.

The panel's report said its order would create a "new exception" to the "Little Steel" formula.

The panel said the case was the first in which inequalities between different industries was recognized. Three previous inequalities recognized by the board

(Please turn to Page 115)

OLD RAILROAD CAR CONVERTED TO TRAINING QUARTERS



CONVERSION of an obsolete railroad passenger car into a "conference car" with training facilities is the manner in which Carnegie-Illinois Steel Corp. met a space shortage problem created by its expansion project at the Homestead, Pa., Works. Above are shown workers attending an "on the spot" training session in the car which is shifted around the works to accommodate the 4000 new employes

80,000 New Cars Needed for 1943 To Relieve Pressure on Railroads

THE COUNTRY'S railroads will need at least 80,000 new cars in 1943 to handle the increased traffic volume, W. C. Kendall, chairman of the Car Service Division, Association of American Railroads, said in Chicago last week.

The present heavy rail movement is largely an "unnatural traffic flow", he stated, pointing to larger shipments of petroleum to the East, movement of mahogany logs from southern Mexico by rail, and shipments of minerals, sulphur and ores by rail which normally would be moved by boat.

Pressure for increased rail movement will continue to be felt next year.

Mr. Kendall predicted there will be no general shortage of railroad cars this year but said a scarcity of drop-end gondola cars is "just around the corner". He explained that it would be largely guesswork to forecast an annual freight peak but expressed doubt that the 1942 high would top 925,000 cars. This would compare with 887,960 cars handled in the week ended Sept. 5 and 899,419 in the week of Aug. 29.

Potatoes, Iron Ore Gaining

An average increase of 9.3 per cent in freight car requirements in the fourth quarter of 1942, as compared with the third quarter, was forecast at a meeting of Great Lakes Regional Advisory Board in Toledo, O., last week. Three thousand cars will be required in the next three months to move a bumper potato crop, an increase of 192.9 per cent over a year ago. Next largest gain in the fourth quarter will be iron ore and concentrates, up 23.6 per cent to 175,000 cars compared with 141,507 cars for the period in 1941.

M. J. Gormley, executive assistant, American Association of Railroads, addressing the association, estimated rail passenger business this year would show an increase of 50 per cent, and freight traffic 30 per cent over the 1941 total. Both divisions together will add about 15 per cent to this year's totals in 1943, he said.

Troop movements during the first nine months of the present war have been more than three times the number during the comparable period of World War I, according to the War Department. Close co-operation between the nation's railroads and the Transportation Corps, Services of Supply, made it possible to accomplish these movements without serious disruption of civilian traffic, although

many of them took place at the peak of a holiday season, and were accompanied by enormous loads of military freight.

In the nine-month period beginning Dec. 7, 1941, troop movements by rail totaled approximately 6,500,000 as opposed to 1,916,417 for the first nine months of the last war. In June, 1942, the Transportation Corps moved almost a million soldiers by rail as against 308,000 in June, 1917.

The rapid development of the 1941 emergency movements was achieved with less rolling stock than was available during a like period in 1917. At the time of the 1917 mobilization, a nationwide inventory showed 2,596,252 locomotives, coaches, freight, passenger, and baggage cars in the service of the railroads, whereas at the start of hostilities in 1941 less than 2,000,000 cars and locomotives were at the disposal of the Army.

The present expeditious movement of troops may be accounted for by several factors, perhaps the most important of which was detailed advance planning by the Transportation Corps. Mechanical elements contributing to the success of the operations included more effective motive power permitting longer trains, decrease in turn-around time, better co-ordination between the Army and the railroads, and increased speed of trains.

Winter Shipping for Iron Ore "Under Consideration"

Winter shipping of iron ore is "under consideration", according to Undersecretary of War Robert P. Patterson, who last week visited Escanaba, Mich. Escanaba is the outlet for the proposed alternate ore movement route to by-pass Sault Ste. Marie in case the locks at the latter should be closed.

Shipments of ore down the lakes by late September had scored such a satisfactory increase that shippers are confident they will attain and exceed the 90,000,000-ton goal for the 1942 season. Some forecast that extraordinary measures may lift the season's total to around 94,000,000 tons.

At the beginning of September, shipments for the season totaled 60,593,534 gross tons, which was 8,880,823 tons above the tonnage moved in the like period of 1941. The increase was approximately 18 per cent.

Last year September shipments were 10,311,517 tons, or slightly more than 1,000,000 tons less than the August movement. The decrease was attributable to weather conditions. However, under war pressure September shipments this year are expected to approximate those of August, 13,235,862 tons.

October shipments last year broke all records on the Great Lakes and exceeded 10,000,000 tons. Shippers believe this year's October movement will be even greater. Some estimate that September and October shipment will aggregate 25,000,000 tons, bringing the season's shipment to Nov. 1 to more than 85,500,000 tons.

November-December shipments in 1941 totaled 8,430,205 tons. If shippers do no better in the closing months of this year, the 94,000,000-ton movement appears assured.

Two new ships, the A. H. FERBERT and the BENJAMIN F. FAIRLESS, have been added to the fleet of the Pittsburgh Steamship Co., United States Steel Corp. subsidiary. The two carriers increase the fleet's net carrying capacity by 19,000 tons. The WILLIAM E. COREY has been withdrawn from the Pittsburgh Steamship Co.'s fleet.

North Carolina-Virginia Pipeline Is Approved

Defense Plant Corp., on the recommendation of the Office of the Petroleum Co-ordinator, has agreed to finance the construction of an eight-inch pipeline from Greensboro, N. C., to a point near Richmond, Va.

The line will be built of second-hand pipe and will provide, together with a privately financed feeder line now under construction from the Houston-Beaumont area of Texas to Baton Rouge, La., a through pipeline movement to the East coast of petroleum products originating in the Texas-Gulf Coast area.

Line will have a capacity of about 30,000 barrels per day of gasoline and light petroleum products, and it is expected that it can be in operation in approximately four months.

All movement of petroleum and petroleum products by domestic waterway craft has been brought under wartime control of the Office of Defense Transportation through the provisions of General Order ODT No. 19.

Order gives the ODT authority to direct the movements of any vessel capable of carrying liquid cargo in bulk, including authority to specify the points at which such cargo is loaded or unloaded.

Finds 265,000 Tons of Scrap

General Motors' Seven Months' Collection Includes Dies and Tools; Borings "Mined"

INTENSIVE scrap drive in 90 General Motors war plants from Connecticut to California has increased the nation's stockpile by a total of 265,500 tons of iron, steel, copper, aluminum and other metals since Jan. 1. In July alone more than 8300 tons of "nonproduction" scrap was uncovered by "waste wardens."

In one plant a virtual iron mine was discovered alongside a railroad siding where cast iron borings had been dumped for years prior to shipping. In another, "scrap scavengers" poked into an almost forgotten cellar and unearthed a 40-pound bronze eagle which investigation revealed had been cast 30 years before in an old bell foundry. Several plants have shipped to mill and smelter tons of railroad rails which formerly served as parking lot bumpers.

In the first seven months of 1942 scrap shipments of all types from GM plants totaled 250,000 tons of iron and steel and 15,500 tons of nonferrous metals. Complete figures for nonproduction scrap

were available only for June and July when 25,118,653 pounds of iron and steel and 574,023 pounds of nonferrous metals were salvaged. In the period from Jan. 1 to June 1 incomplete reports from 24 divisions reveal that 44,575,828 pounds of nonproduction iron and steel and 744,909 pounds of other metals were shipped.

Meanwhile, automobile divisions have been analyzing all stored dies to determine whether they need be held for manufacture of essential replacement parts. Following such a study one division shipped out 160 tons of dies in a single lot. Two weeks later another shipment of 72 tons was made. Another division scrapped 480 tons of dies in July alone.

Nonmetals Also Salvaged

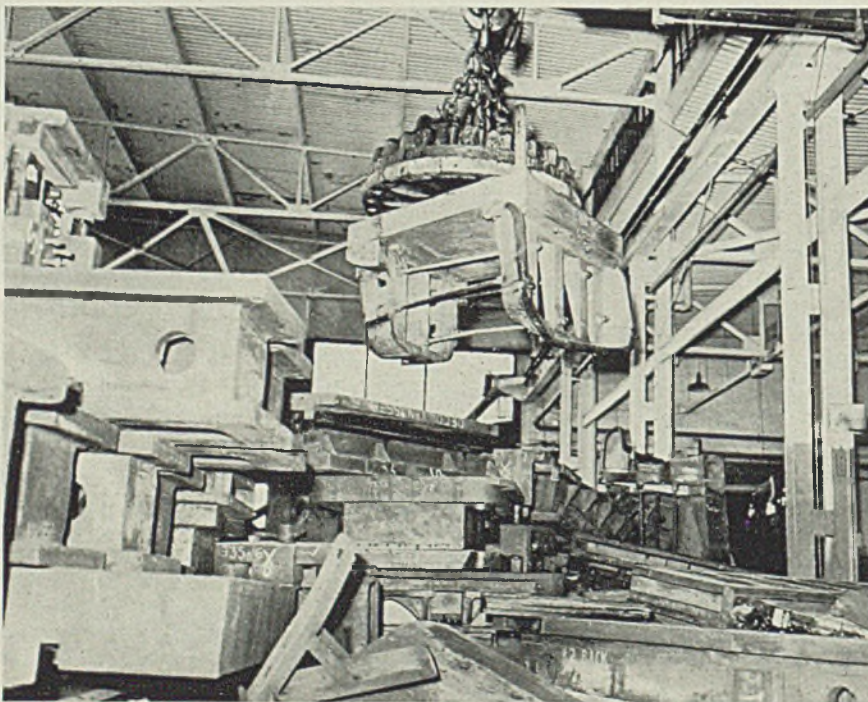
Salvage of rubber, rags, paper and other nonmetal products is also an objective of the drive. A total of 2,130,977 pounds of these miscellaneous items was collected in July alone. Large crates and boxes formerly burned are now taken apart. Usable lumber is turned over to carpenter shops, cutting down on requirements for new lumber. Kindling is given to employes to save coal. Newspapers and magazines are shredded for use in packing products for shipment.

As a result of such activities a plant in Ohio found its incinerator was no longer needed. It was dismantled, and the steel stack provided 13 tons of scrap.

POCKET-EDITION DRIVE



GOOD luck horse shoe that came from over the barn door goes into the pocket-edition scrap collection depot at Bethlehem Steel Co.'s main office building, Bethlehem, Pa. Contributor is E. M. Penniman of the accounting department. Campaign already brought in nearly 8 tons of iron and steel, in addition to considerable quantities of nonferrous metals



Enough old metal to provide the scrap necessary to build two 35,000-ton battleships has been collected in General Motors war plants since the beginning of the year. Pictured above is the scrap pile at the Oldsmobile Division. Electro-magnet crane is swinging a heavy die onto the pile

Workmen also are participating in the drive individually. Work benches and tool boxes are being combed for bits of scrap metal. Pieces of iron and steel found in the home are being brought in and deposited in containers provided for the purpose. Rubber heels from old work shoes are collected.

General Motors also made available to the national scrap stockpile large quantities of dies, tools, jigs and fixtures which had been used by suppliers to manufacture parts for peacetime products. These were owned by the Corporation but had been stored in the plants of the suppliers.

One scrap committee chairman reported that "dormant metal has been ferreted out from beneath benches, in cupboards and desks, hanging on the walls and in out-of-the-way places in buildings and in the yards." He said one large cupboard was found to contain five shelves piled high with metal. When this cache was boiled down to essential pieces, only one shelf remained. In one week alone, he said, 90 tons of iron and steel were dug up in this way.

Looking through its tool "morgue," one
(Please turn to Page 113)

Irvin Works Sets World Record in Plate Production

World record production of steel ship plates, more than enough for 35 Liberty cargo vessels, was achieved in August by Irvin Works of Carnegie-Illinois Steel Corp., a plant that had not rolled a plate until its conversion from sheet steel production five months ago. August tonnage exceeded the known plate output of any other plant in the steel industry, and was thousands of tons greater than the maximum estimated at the time of conversion.

Platemaking facilities at Irvin were installed in 37 days and rollin τ of heavy-gage material was started April 17. The conversion was speeded by use of "bits and pieces" brought from numerous plants, rebuilt and installed in the new plate line. A steam-driven shear of the last century and an outmoded roller-leveler were reconditioned and installed in a modern electric-driven finishing line.

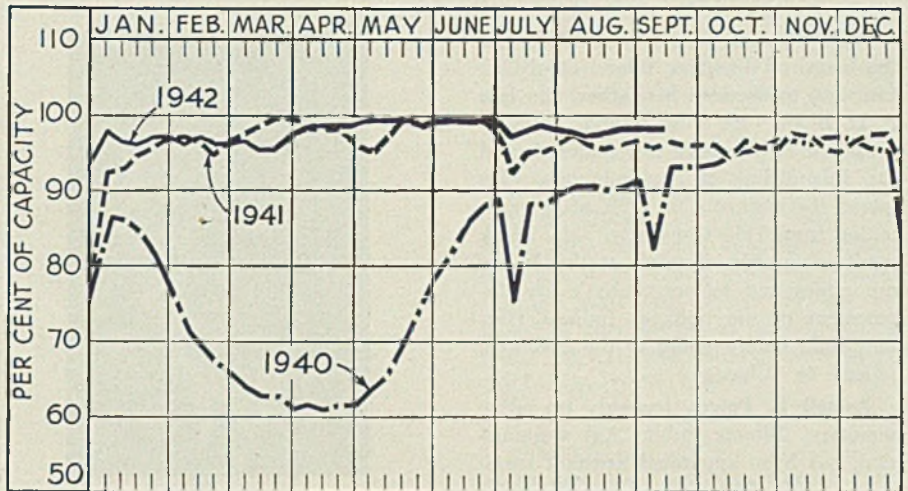
Inland Strip-Plate Mill Beats Own Record

Inland Steel Co. achieved a new all-time high in August for its 76-inch hot strip mill at Indiana Harbor Works. Plate tonnage from this mill exceeded the previous record, made in July, by 0.15 per cent and was an increase of 178.9 per cent over average monthly plate shipments before Pearl Harbor.

The August record was made under direction of J. F. Mayberry, superintendent; Walter Mulflur, assistant superintendent; E. Schwenk, plate foreman; T. M. Davitt, finishing end foreman, and L. Jerome, shipper. The company credits the entire mill personnel with participation in this accomplishment.

Western Pennsylvania Coal Production Up 23 Per Cent

Coal mines in nine Western Pennsylvania counties increased production by more than 9,000,000 tons during the first seven months this year, compared with the corresponding period in 1941. Western Pennsylvania Coal Operators' Association reports production to Aug. 1 was 50,978,303 tons, against 41,607,944 tons to the same date last year, an increase of about 23 per cent. This total was made up of 23,970,000 tons from captive mines, 24,838,217 tons from commercial mines and 2,169,484 tons from truck mines. July production was 7,237,957 tons, 2 per cent less than June output.



STEEL STEADY

PRODUCTION of open-hearth, bessemer and electric furnace ingots last week continued at 98 per cent of capacity. Four districts gained, five declined and three were unchanged. A year ago the rate was 96 per cent; two years ago it was 93 per cent, both computed on the basis of capacity as of those dates.

Chicago — Up 1 point to 102½ per cent, due to completed furnace repairs and better scrap supply, the recent shortage being relieved.

Pittsburgh — Unchanged at 95 per cent, shifts in furnace units causing no change.

Wheeling — Rebounded 4½ points from the low of the preceding week, to 84½ per cent.

Detroit — Three open hearths were down for repairs most of the week and the rate declined 4 points to 89 per cent.

Birmingham, Ala. — With 23 open hearths in production the rate continued at 95 per cent.

Cincinnati — Need for repairing several open hearths simultaneously caused production to decline 8 points to 83.

Central eastern seaboard — Slightly better supply of scrap and pig iron caused

production to increase 1½ points to 96½ per cent.

St. Louis — Reduction of an open hearth to half-capacity cut the rate ½-point to 95 per cent.

Cleveland — Increased activity by one interest was more than balanced by declines by two others, with a net loss of 1½ points to 93 per cent.

Buffalo—Unchanged at 90½ per cent.

Youngstown, O.—Down 2 points to 95 per cent, due to furnace repairs. Scrap is sufficient for current rate but no reserve is accumulated.

New England—Completion of minor repairs to one unit caused a gain of 5 points to 100 per cent.

Antiaircraft Gun Production At Blaw-Knox Commended

Completion of company's one-hundredth 40-millimeter antiaircraft gun ahead of schedule was observed last week at a ceremony at the Martins Ferry, O., plant of Blaw-Knox Co. L. C. Edgar Jr., division superintendent, and the labor-management committee were congratulated by Albert N. Connert, naval inspector of ordnance.

The plant, not yet in full production, started operations in December, 1941, after being converted from a tin plate mill. First gun was delivered May 1.

For fiscal year ended June 30, 1942, Colorado Fuel & Iron Corp., Denver, reports net income after all charges as \$2,580,134. This compares with \$2,288,318 earned in the preceding 12 months.

District Steel Rates

District	Percentage of Ingot Capacity Engaged in Leading Districts		Same week	
	Week ended Sept. 19	Change	1941	1940
Pittsburgh	95	None	98	88.5
Chicago	102.5	+ 1	100	98.5
Eastern Pa.	96.5	+ 1.5	95	92
Youngstown	95	- 2	98	83
Wheeling	84.5	+ 4.5	86	97
Cleveland	93	- 1.5	94.5	88
Buffalo	90.5	None	90.5	90.5
Birmingham	95	None	95	97
New England	100	+ 5	90	80
Cincinnati	83	- 8	88	79
St. Louis	95	- 0.5	98	80
Detroit	89	- 4	95	91
Average	98	None	96	93

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

MEN of INDUSTRY

P. D. BLOCK JR. has been elected to the board of directors, Inland Steel Co., Chicago, to succeed his father, the late P. D. Block. He is assistant to the vice president in charge of raw materials and the Inland line of ore freighters. He joined the company in 1928, after graduation from Yale University. Mr. Block spent a number of years at the Inland ore mines and in practically every department of the mills at Indiana Harbor, Ind., before going to the executive offices in Chicago.

Russell L. Peters, formerly executive secretary, Illinois Public Aid Commission, has been appointed assistant treasurer of Inland.

Henry J. Chanon, lighting engineer with General Electric Co.'s lamp department at Nela Park, Cleveland, has been transferred to the company's south Pacific division in Los Angeles, where he will specialize in the design of lighting systems for West Coast aircraft industries, shipbuilding, and wartime motion picture production work. He will also serve as consultant for blackout of coastal areas in the southern California region.

Robert P. Freehafer, assistant purchasing agent, Carpenter Steel Co., Reading, Pa., has been promoted to purchasing agent.

Herbert J. Burgess has been named general superintendent in charge of manufacturing at the East Springfield, Mass., plant of Westinghouse Electric & Mfg. Co.

T. M. Girdler, chairman of the boards of Republic Steel Corp., Consolidated Aircraft Corp. and Vultee Aircraft Inc.,



John S. Stanier

Whose appointment as superintendent of hot and cold strip mills, Youngstown Sheet & Tube Co., Youngstown, O., was reported in STEEL, Sept. 14, p. 87



P. D. Block Jr.

continues as executive vice president, with headquarters in Chicago. Mr. O'Brien has been associated with the can manufacturing industry more than 25 years, joining Continental in 1928 upon the company's acquisition of the Southern Can Co., Baltimore, with which company he held the position of vice president and general manager.

Frank J. Kevlin has been appointed traffic manager, Falk Corp., Milwaukee. Mr. Kevlin, who has been handling the traffic work for Falk for a number of years, will continue in his jurisdiction over the traffic division and in addition will act as manager of the shipping department.

Bradford C. Colcord, general superintendent, National Tube Co., McKeesport, Pa., has been promoted to assistant vice president of operation, with headquarters in Pittsburgh. **R. M. Overton**, assistant general superintendent of National works, has been advanced to general superintendent of the plant, and **O. P. Adams**, superintendent of maintenance, succeeds Mr. Overton as assistant general superintendent, National works.

John C. Fowler, vice president in charge at Lewiston, Me., for Brown-Wales Co., Boston, has resigned to join the armed forces. **Charles A. Sadler**, for many years representative in that territory for Brown-Wales, has been appointed manager, succeeding Mr. Fowler.

Charles R. Papay has joined Designers for Industry Inc., Cleveland, as director of engineering. He was formerly chief engineer, Moore Engineering Co., South Bend, Ind.; senior planning engineer, Bendix Aviation Corp., South Bend,



Henry J. Chanon

has resigned from the board of directors of Aviation Corp., New York. He will, however, be available to the company for consultation.

Harold E. Koch, vice president, Hevi Duty Electric Co., Milwaukee, has been elected president, succeeding the late Edwin L. Smalley. **George A. Chutter**, eastern district manager, and **Norman C. Bloye**, sales engineering department, have been named vice presidents.

Thomas D. Jolly, chief engineer and director of purchases, and **M. M. Anderson**, personnel manager and director of labor relations, Aluminum Co. of America, Pittsburgh, have been elected vice presidents. Mr. Jolly also is in charge of the construction program through which the company is building 21 aluminum plants for the Defense Plant Corp.

Frank J. O'Brien, the past six years in charge of manufacture, Continental Can Co. Inc., New York, has been elected executive vice president, with headquarters in New York. **S. J. Steele**, con-



A. S. Glossbrenner

Who has been appointed superintendent of Brier Hill plants, Youngstown Sheet & Tube Co., Youngstown, O., as noted in STEEL, Sept. 14, p. 87

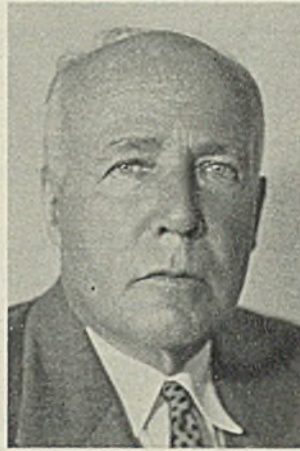
Ind.; chief engineer, Pacific Coast Management Corp. of California; assistant development engineer, Model Engineering Co., Cleveland; and power engineer, Arizona Edison Co., Yuma, Ariz.

James S. Hagan has been named manager of the northwestern district, Westinghouse Electric & Mfg. Co., Chicago, and will supervise repair and manufacturing activities. He succeeds R. E. Powers, who is now serving as Pacific Coast district manager of the department. Mr. Hagan has been associated with Westinghouse 26 years.

Crispin Oglebay, president, Oglebay, Norton & Co., Cleveland, has been elected a director of the Baltimore & Ohio Railroad Co. Mr. Oglebay is a director and trustee of many civic, scientific, educational and business organizations.

F. A. Endress has resigned as president, Tuff-Hard Corp., Detroit, to devote more time to research and development work as the company's technical consultant.

Alan P. Beebe, vice president, Peninsular Grinding Wheel Co., Detroit, and director of Pettijohn-Milliken, Chicago,



Crispin Oglebay

and Steven J. Menzel, president of Motors Metal Mfg. Co., Detroit, have been elected to the board of directors of Tuff-Hard Corp., which manufactures tool bits and special tools using a special heat treating process.

John Z. Lander, formerly vice president of Tuff-Hard, now is executive vice president. The office of president is unfilled temporarily.

Dr. Charles B. Jolliffe, formerly assist-

ant to president, Radio Corp. of America, and chief engineer of RCA Laboratories, has been named vice president and chief engineer, RCA Mfg. Co. Inc., Camden, N. J.

Willard E. Henges, associated with Graybar Electric Co. Inc., New York, since 1913, has been appointed district manager at St. Louis, replacing George Corrao, who has asked to be relieved of duty subject to retirement next year. Mr. Henges formerly was assistant manager at St. Louis.

Z. H. Mischka has been named advertising manager, American-Marietta Co., Chicago, succeeding Marvin E. Smith, who has entered the service. Mr. Mischka was formerly associated with William H. Harshe Co., Chicago public relations firm, where he was in charge of industrial accounts.

Robert B. Leslie, formerly general manager, Vischer Products Co., Chicago, has joined the executive staff of Cook Electric Co., Chicago, manufacturer of telephone apparatus and aeronautical accessories.

OBITUARIES . . .

Joseph Frederick Froggett, senior editor of STEEL, and its affiliated Penton Publications, *Daily Metal Trade*, *The Foundry*, *Machine Design* and *New Equipment Digest*, died in St. Luke's hospital, Cleveland, Sept. 11. He was 72 years old.

"Joe", as he was familiarly known by hundreds of his friends in the steel and metalworking industries, was born in Youngstown in 1870. He learned much about the early history of the steel industry from his father, a blast furnace operator, and at the time of his death few individuals had more background information about the industry.

He joined the *Youngstown Telegram* as a reporter in 1890, later becoming managing editor. In 1906, he became associated with the *Cleveland Plain Dealer* and on Jan. 6, 1908 became associated with the Penton Publishing Co., as assistant to George Smart, then editor of IRON TRADE REVIEW, now STEEL.

When the daily edition of the REVIEW was inaugurated in 1909, he devoted considerable time to it. Later the daily edition was enlarged and renamed *Daily Iron Trade Review* and Mr. Froggett was made managing editor.

He subsequently became editor of *Daily Iron Trade Review* and its suc-

cessor, *Daily Metal Trade*. In 1925, he was made senior editor of Penton Publications.

He continued active until about three



Joseph Frederick Froggett

weeks ago. He is survived by a daughter, Mrs. W. M. Carran, Cleveland Heights, and two grandchildren.

Charles R. Miller, 56, a partner in the Miller & Miller Machine & Tool Co., Detroit, died Sept. 1.

William E. Clow, 81, chairman of the board, James B. Clow & Sons, Chicago,

died in Highland Park, Ill., Sept. 14. He went to Chicago from Pittsburgh in 1877 and entered business with his father, James B. Clow. He was vice president from 1907 to 1935, when he became chairman.

Joseph F. Foy, 34, secretary, Foy Stoker Mfg. Co., Chicago, died in that city, Sept. 9.

Arthur W. Glessner, 81, president, Excelsior Steel Furnace Co., Chicago, died in that city, Sept. 10. He founded the company 62 years ago.

Harold Foster, for many years tool steel salesman, Boston office, Bethlehem Steel Co., died at his home in Melrose, Mass., Sept. 15.

Howard J. Kaighin, president and treasurer, American Welding & Mfg. Co., Warren, O., died in an automobile accident, Sept. 4.

Roy Hunter, 54, district manager in the Cleveland territory for Gisholt Machine Co., Madison, Wis., died Sept. 13, in that city. Before joining Gisholt he had been associated with International Machine Tool Co., Indianapolis, for 25 years.

Many Associations Study War Problems

American Institute of Steel Construction: Within the past 12 months the largest arsenal for war production the world has ever known has been constructed in the United States. The speed with which the war plants have been erected is the key to the potential success of the Allies, and that speed was made possible by the American art and organization for shop fabrication of structural steel shapes and plates. This, in brief, is to be the keynote of the twentieth annual convention in Broadmoor Hotel, Colorado Springs, Colo., starting on Sept. 29.

Four days will be devoted to problems growing out of the war and to problems to be developed from the war. Taking the slogan "the peace worth fighting for, is the peace worth planning for", the convention will devote one entire day to a discussion of postwar work. Speakers scheduled for this particular session will include: John C. Page, commissioner, United States Bureau of Reclamation; Walter R. MacCornack, American Institute of Architects; G. Donald Kennedy, commissioner, Michigan state highway department.

Boston Conference on Distribution: Fourteenth annual meeting, Hotel Statler, Boston, Oct. 5-6.

Open-Hearth Committee: Ohio section will meet at Deshler-Wallick hotel, Columbus, O., Oct. 16-17. Those who plan to attend the football game at Ohio State University Saturday afternoon should make reservations immediately.

American Management Association: Techniques and methods of adjusting office operations to wartime problems will be discussed at an office management conference in Drake hotel, Chicago, Oct. 15-16.

Associated Machine Tool Dealers of America: Fall meeting will be held in Hotel Pennsylvania, New York, Oct. 7, with a morning and afternoon session, and luncheon.

Controllers Institute of America: W. P. Witherow, president, Blaw-Knox Co., Pittsburgh and of the National Association of Manufacturers, will speak on "A Program to Defeat Inflation" at the institute's annual banquet, Palmer House, Chicago, Sept. 22. F. J. Carr, vice pres-

ident, American Steel & Wire Co., Cleveland, will speak Tuesday morning on "New Products and Their Effects on Post-War Conditions." J. E. McMullen, controller, Colorado Fuel & Iron Corp., Denver, will conduct a breakfast conference on steel and metal manufacturing controllership procedure.

Society of Automotive Engineers, Inc.: National aircraft production meeting is scheduled for Oct. 1-3, Biltmore hotel, Los Angeles. The purpose is to enable key engineers to confer on details of aircraft design and construction, and to discuss requirements for expediting production of planes.

American Welding Society: Each of the 60 papers to be presented at the annual meeting in Hotel Cleveland, Cleveland, during the week of Oct. 12, will have some important bearing on some phase of war production. Many papers will deal with aircraft construction and shipbuilding.

Pittsburgh Foundrymen's Association: Training-Within-Industry Division of the War Production Board will sponsor a Manpower Clinic at the meeting, Sept. 24, Fort Pitt Hotel, Pittsburgh.

Compressed Air Institute Discusses Regulations

Members of the Compressed Air Institute held a 2-day meeting at Hotel Hershey, Hershey, Pa., Sept. 10 and 11, to interchange ideas for speeding up production of their war products.

A principal speaker was David S. Gibson, manager, priorities division, Worthington Pump & Machinery Corp., Buffalo, who analyzed latest government regulations, the making of required reports and similar matters.

Member companies represented: Allis-Chalmers Mfg. Co., Buckeye Portable Tool Co., Bury Compressor Co., Chicago Pneumatic Tool Co., Clark Brothers Co. Inc., Cleveland Pneumatic Tool Co., Cleveland Rock Drill Co., Dallett Co., DeLaval Steam Turbine Co., Elliott Co., Fuller Co., Gardner-Denver Co., Independent Pneumatic Tool Co., Ingersoll-Rand Co., William H. Keller Inc., Nash Engineering Co., Nordberg Mfg. Co., Pennsylvania Pump & Compressor Co., Roots-Connersville Blower Corp., Rotor Tool Co., Schramm Inc., Sullivan Machinery Co., Worthington Pump & Machinery Corp.

PRESIDENT CONFERS WITH PACIFIC WAR COUNCIL



PACIFIC War Council: Left to right; Sir Owen Dixon, Australia; Leighton McCarthy, Canada; Walter Nash, New Zealand; Lord Halifax, Great Britain; Dr. T. V. Soong, China; Dr. A. Loudon, ambassador from the Netherlands; Manuel Quezon, president from the Philippine Commonwealth. President Roosevelt is seated, center. NEA photo

PRIORITIES-ALLOCATIONS-PRICES

Weekly summary of orders and regulations issued by WPB and OPA, supplementary to Priorities-Allocations-Prices Guide as published in Section II of STEEL, July 6, 1942

Application for release must be made to WPB on PD-556.

E ORDERS

E-1-b (Amendment): Machine Tools, effective Sept. 9. Reclassifies groups which are assigned 75 per cent of monthly production of each producer. Does not affect deliveries scheduled for September and October. Permits machine tools to be rated by a certificate of the PD-408 series.

PRICE REGULATIONS

No. 6 (Amendment): Iron and Steel Products, effective Sept. 17. Sets maximum prices for rejected flat-rolled and semifinished steel products. Rejects fixed at 85% of base price and applicable extras on prime material; wasters at 75%; waste wasters at 65%, except plates which take waster price, tin plate which is \$2.80 per 100 lbs. andterne plate which is \$2.25 per 100 lbs.; semifinished at 85%. Transportation costs to delivery point may be added. Other off grades may not be sold at prices above levels of primes.

No. 136 (Amendment): Machines and Parts and Machinery Services, effective Sept. 29. Adds automotive parts, subassemblies and accessories, when sold by the manufacturer, to items to which March 31, 1942, date is applicable. Such products previously were covered by the General Maximum Price Regulation, which provided same price levels.

No. 202 (Correction): Brass and Bronze Alloy Ingot, effective Sept. 12. In Table II, minimum tin content for alloy ingot No. 210 should read 9% instead of 9.75%. In Table III, maximum price per lb. for ingot No. 298 should be 14.75c instead of 15.75c.

No. 217: Walnut Gunstock Blauks, effective Sept. 17. Places such blanks under specific ceiling prices, removing them from General Maximum Price Regulation.

No. 218: Central Appalachian Wooden Mine Materials, effective Sept. 8. Sets specific maximum prices for standard and round pit posts, mine caps, wedges, cribbing block, ties, crossbars and switch ties.

M ORDERS

M-36 (Amendment): Manila Fiber and Manila Cordage, effective Sept. 14. Withdraws previous requirement that all deliveries of manila cordage be authorized. Requires attachment of certificate to every purchase order naming war agency for which material is requested. Permits Metals Reserve Co. to purchase frozen stocks of fiber. Revokes provision permitting unrestricted sale of cordage not useable by armed forces.

M-63-a (Amendment): Imports of Strategic Materials, effective Sept. 11. Permits imports of products of Guatemala and El Salvador on List III of M-63. Latter order amended, effective Sept. 11, to move silver from List I to List II.

M-225: Overhead Traveling Cranes, effective Sept. 8. Permits WPB to establish production and delivery schedules which must be maintained without regard to any preference ratings already assigned or subsequently assigned.

M-231: Chemical Fertilizers, effective Sept. 14. Restricts delivery and use of nitrogen fertilizers.

equipment for the project also using iron, steel or copper. All other required utility facilities will be granted the lowest rating assigned to materials for the project, but not less than A-5.

L ORDERS

L-37-a (Amendment): Musical Instruments, effective Sept. 14. Requires sale of frozen stocks of manufacturers, wholesalers and jobbers direct to armed forces, rather than through brokers or other intermediaries.

L-89 (Amendment): Elevators, effective Sept. 10. Prohibits cork and cork products, except cork tile, from use on plat'orm or as wainscot on all passenger and freight elevators.

L-134 (Amended): Instruments, Valves and Regulators Used in Industrial Processes, effective Sept. 9. Increases ratings on which manufacturers or dealers may deliver new equipment from A-10 to A-1-c, and changes required rating for deliveries of repair and maintenance supplies from A-10 to A-8 or higher, except on equipment needed by various specified government agencies.

L-142: Metal Doors, effective Sept. 16. Prohibits production of metal doors, frames and shutters, except fire doors meeting certain specifications and airplane hangar doors. Permits orders on hand to be filled if completed in 45 days or intended for rated project already under way. Applies to both military and civilian use.

L-176: Portable Electric Fans, effective Sept. 7. Freezes stocks in hands of manufacturers.

P ORDERS

P-46 (Amendment): Maintenance, Repair and Supplies of Utilities, effective Sept. 12. Provides that suppliers of utility services to projects rated A-5 or better which require iron, steel or copper for their construction will be granted the highest rating assigned to other

Use of Steel Shipping Drums Further Restricted

Further restrictions on the use of new or second-hand steel shipping drums have been ordered by WPB, effective in 60 days. The restriction is expected to conserve about 200,000 tons of steel annually. Prohibited is the use of such drums for packing some 200 food, chemical and petroleum products.

Metal Door Production Halted by War Board Order

Production of metal doors, metal door frames and metal shutters for military or civilian use has been prohibited.

Previously, manufacture of these products for civilian use had been controlled by the denial of preference rating applications for metal except for essential uses.

New order halts all production except for fire doors meeting certain maximum specifications and for airplane hangar doors.

Copper Chemicals Placed Under Allocation Control

Copper chemicals have been placed under complete allocation control to

conserve copper scrap from which they are made.

Order M-227 lists copper chemicals as copper sulphate, carbonate, chloride, oxide, nitrate and cyanide. Allocation will take effect Oct. 1.

Small order deliveries may be made by certification from the purchaser to his supplier. Limits on these small deliveries are 450 pounds of copper sulphate or 25 pounds of the other chemicals in any one month.

The standard chemical forms, PD-600 and PD-601 must be used by those seeking allocation and by suppliers making deliveries for reports to the WPB.

Phosphorous Allocation Control To Become Effective Oct. 1

Phosphorus has been placed under complete allocation control. Allocation will begin Oct. 1.

The action was taken in Order M-230. Persons seeking allocation must apply on Form PD-600 and suppliers are required to report monthly on Form PD-601.

Persons seeking 1000 pounds or less of phosphorus in any one month may obtain delivery by certificate to their suppliers and need not file PD-600.

August War Expenditures Up 8.1 Per Cent from July

War expenditures of the government in August were \$5,182,000,000. This includes Treasury disbursements and estimated Reconstruction Finance Corp. expenditures.

The August total compared with \$4,794,000,000 spent in July, a rise of 8.1 per cent, and with \$1,196,000,000 in August, 1941, an increase of more than 333 per cent.

Daily rate of spending in August was \$199,300,000, up 8.1 per cent from a daily rate of \$184,400,000 in July. The percentage of gain over the previous month was 16.3 per cent in July and 6.3 per cent in June.

Total federal expenditures for war purposes from July 1, 1940, when the national defense program began to gather momentum, through the end of August, this year, were in excess of \$44,700,000,000.

This can be broken down for the 26-month period as follows: War Department \$23,372,000,000; Navy Department \$13,271,000,000; Maritime Commission \$1,370,000,000; other war agencies \$6,728,000,000.

WINDOWS of WASHINGTON

What to do with idle plants becoming increasingly difficult problem. Concentration of production of essential civilian goods in a few factories may be one solution. Some programs underway

TO what extent are liquidation procedures going to be applied to plants made idle as a result of War Production Board orders under which manufacture of certain products is discontinued or limited? To what extent will plants be made idle because of such orders? The answer to these questions is not yet clear. However, it is possible to deduce certain implications.

Up to this time official thinking has been in terms of "conversions"—that is, conversion from peacetime to wartime production. Under this hypothesis it has been assumed that plants would be idle or in partial operation only during a brief transitional period.

Now, however, there is reason to believe that this viewpoint may have to be modified. Our war producing capacity already has gotten ahead of our materials supply, at least in certain war items. To some extent this condition undoubtedly is due to the fact that the difficult problem of delivering the right material, in the right quantity, at the right place, at the right time, has not yet been solved. At least there is no proof that it has been solved, whereas there are plenty of indications to support the belief that the problem is one of proper distribution—of management rather than production of materials.

One of the evidences to support that view is to be found in the fact that the Distressed Stocks Unit of the Iron and Steel Branch already has cleared more than 1,000,000 tons of steel from frozen and surplus inventories, with the end nowhere in sight.

Threat to Small Plants Growing

The Smaller War Plants Corp. has endeavored to find war work for small plants whose normal activities are affected by limitation orders, but without outstanding success up to the present time. So many obstacles hinder this program (see STEEL of Aug. 10, p. 50) that only slow progress toward this objective may be expected even should the Smaller War Plants Corp. be able to find work for these plants on a large scale and materials to support their production lines.

Hence, the problem of what to do with idle plants probably will become more important in the next few months. It is a problem which may be examined at this time, particularly because the number of small plants with the threat

of being rendered idle runs into the thousands.

Under the present organization in the War Production Board a new committee recently appointed by E. J. Kanzler, director general of operations, will bear the chief responsibility in determining what is to be done about idle plants. Of this committee, known as the Concentration Committee, Joseph L. Weiner, is chairman. Its other members are Wendell Lund, director of the Labor Division, and Lou E. Holland, deputy chairman of the Smaller War Plants Unit and chairman, Smaller War Plants Corp.

To Concentrate Production

This committee, now beginning to function, is to be the mechanism for concentrating production of certain essential consumer goods in selected plants. These plants are to be chosen with respect to a number of factors. The first is that such production should be carried on in areas where labor shortages are not acute. Another is that the plants must be so located as to permit delivery of raw materials and shipment of finished product with the least burden on the country's transportation system.

Up to this time, it will be recalled, "concentration" programs already have been applied in the bicycle and the stove and range industries. Of 12 bicycle manufacturers in this country, only two now are permitted to make bicycles, at a combined rate of 10,000 machines a month. Of the more than 400 manufacturers of stoves and ranges and related appliances only 126 now are making these products.

Nor has "concentration" been limited to civilian goods. What amounts to the same thing has, for example, been in effect, through government edict, in the machine tool industry. Months ago, certain plants which built several lines of machines were ordered to limit their activities to some one line in which they excelled because of long experience, special manufacturing equipment, or handling facilities. The efficiency of the industry as a whole in meeting the war emergency admittedly has been considerably improved by this enforced but logical specialization.

The assumption is that the plants by these limitation orders deprived of their normal activities have switched or will switch to war work. A rather casual check reveals that the former bicycle and stove plants now are en-

gaging all the way from 20 to 85 per cent in war production. This check has not been made as thoroughly as might be desired and hence its results cannot be accepted as being strictly accurate.

In addition to the bicycle and stove and range concentrations, another such program is about to be applied to the farm implements manufacturing industry. Farm machinery production originally was cut to an average of 83 per cent of 1940 output, with certain exceptions as in the case of machinery required to step up production of oil-bearing farm products such as soy beans. The present program will reduce farm machinery production to an average of 38 per cent of the 1940 production. It is expected that many of the 1400 or more companies in that field will discontinue production of their normal products altogether for the reason that volume production in the "nucleus" plants will make for greater efficiency.

The procedure involved in setting up the concentration programs already instituted will not be considered by the new Concentration Committee as precedents. The committee proposes to start afresh, without any preconceived notions. It does not propose to formulate any general or overall policy for concentrations. Rather, it will consider each case on its own merits and make recommendations accordingly to the director general of operations for approval. It proposes to act in accordance with the general policy of the War Production Board, which is to make investigations in conjunction with fully representative industry advisory committees. Nothing new or revolutionary is to be sprung on manufacturers overnight.

Many Rumors Circulating

A spokesman for the committee offers a word of caution as to accepting rumors now making the rounds as to industries that are to be concentrated. Various reports purported to come from "inside" sources have named quite a few industries as objects of concentration programs. It is quite possible that such programs may be applied to one or more of these industries. But, aside from these programs mentioned above, which were applied or in process of being finally formulated before the new committee took over, the slate now is said to be clean for the moment.

In the meantime, the question as to what is going to happen to idle plants is the subject of considerable unofficial speculation. Certainly, at a time when the country must make the fullest use of what it has on hand it seems entirely unlikely that any idle plants will escape

“PUT IT ON THE BLANCHARD”

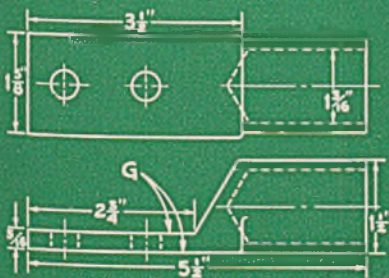


BLANCHARD

**CHECK THESE
ADVANTAGES
OF BLANCHARD
GRINDING**

- ★ **Production**
- ★ **Adaptability**
- Fixture Saving**
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- Material Saving**
- Fine Finish**
- Flatness**
- Close Limits**

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..... Especially
valuable on jobs like
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Courtesy of
CARPENTER MFG. CO.
CAMBRIDGE, MASS.

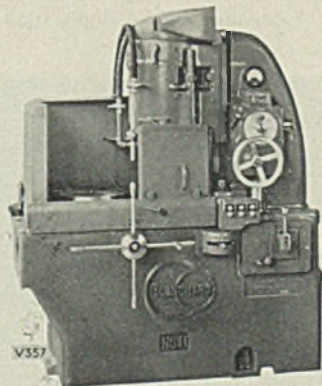
Less Than
TWO MINUTES EACH

THESE copper lugs for large cable are ground on both sides on a No. 11 Blanchard Surface Grinder in Blanchard designed fixtures.

Both sides of the castings are ground to clean up — to close limits for parallelism. The floor to floor time is less than two minutes each.

This is a good example of work with a projecting surface that can be ground to advantage on a Blanchard. This is accomplished by mounting the lugs in the fixtures with the round end toward the center of the chuck. The chuck is moved under the wheel to the proper depth and then the wheel is fed down until all the surfaces on one side are ground clean. The same method is used for grinding the surfaces on the other side.

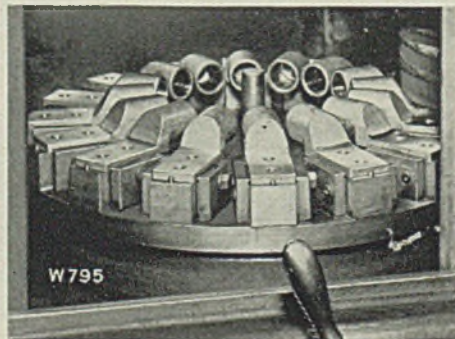
Whether your work requires fine finish or extreme accuracy — whether it requires light finishing cuts or hogging cuts, the Blanchard No. 11 will do the job quickly and economically.



Blanchard No. 11 Surface
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Send for your free copy
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Blanchard owners.



Grinding offset side of lugs



Grinding flat side of lugs

liquidation to at least some extent. These plants contain a lot of equipment, materials and supplies which could be transferred to other plants or which could be dismantled to help ease the scrap shortage. They are equipped with railroad sidings which could be salvaged. As a rule they contain paper, erasers, carbon paper, towels, desks, chairs, typewriters and other office machinery, soap and so on for which good uses could be found.

Incidentally, since the chairman of the new Concentration Committee also is deputy director of Civilian Supply, the impression exists in well-informed circles that civilian industries will get fair treatment. In fact, in one quarter it has been stated that Mr. Weiner, in such cases, might be expected to serve as "attorney for the defense".

Because the concentration program will have to be carried out in such a manner as to alleviate rather than further

aggravate the problem of labor shortages, manufacturers in general will be interested in knowing more about this factor. Release 1116 of the Division of Industry Operations of the War Production Board, containing details of the order limiting manufacture of stoves and ranges and related appliances listed 39 "labor shortage" areas as follows:

Huntsville, Ala.; Beverly Hills, Culver City, Huntington Park, Irvin-ton, Los Angeles, Monrovia, North Hollywood, Oakland, Petaluma, San Francisco, San Rafael and Stockton, Calif.; Hartford and New Britain, Conn.; Indianapolis and South Bend, Ind.; Wichita, Kans.; Portland, Me.; Baltimore and Perryville, Md.; Milan, Mich.; Salmon Falls, N.H.; Cranford, Newark and West Berlin, N. J.; North Tonawanda, N. Y.; Akron, Cleveland, and Massillon, O.; Portland, Ore.; Erie, Mansdale, Middletown, Philadelphia, Pottstown and Royersford, Pa.; Everett and Seattle, Wash.

stocks in individual warehouses in each manufacturing area.

To solve the warehouse situation, it is said in some quarters, a really "tough" policy might have to be instituted. It would have to be based on the fact that a limited number of distributors normally do about 95 per cent of the business. If provisions were made to keep these warehouses fully stocked, with a minimum amount of duplication in each manufacturing district, a big gain would have been made in enabling war manufacturers to obtain needed supplies of steel.

To be effective such a plan would embrace provisions against unwarranted duplications; many warehouses would handle fewer items than at present. Too, such a plan would probably entail elimination of a great many small stocks all over the country. Such a cure would bring on some new diseases since a large number of these small stocks, particularly those in certain sections of the Far West and South, include materials and parts used principally in repair and maintenance. Special provisions would have to be made to take care of such requirements, and this would be a rather complicated problem.

The foregoing discussion should by no means be taken to indicate official conclusions. It represents only some of the thinking that now is being devoted to the warehouse problem. No real solution yet has been formulated.

OPA Administrator Leon Henderson has invited 18 warehousemen and job-

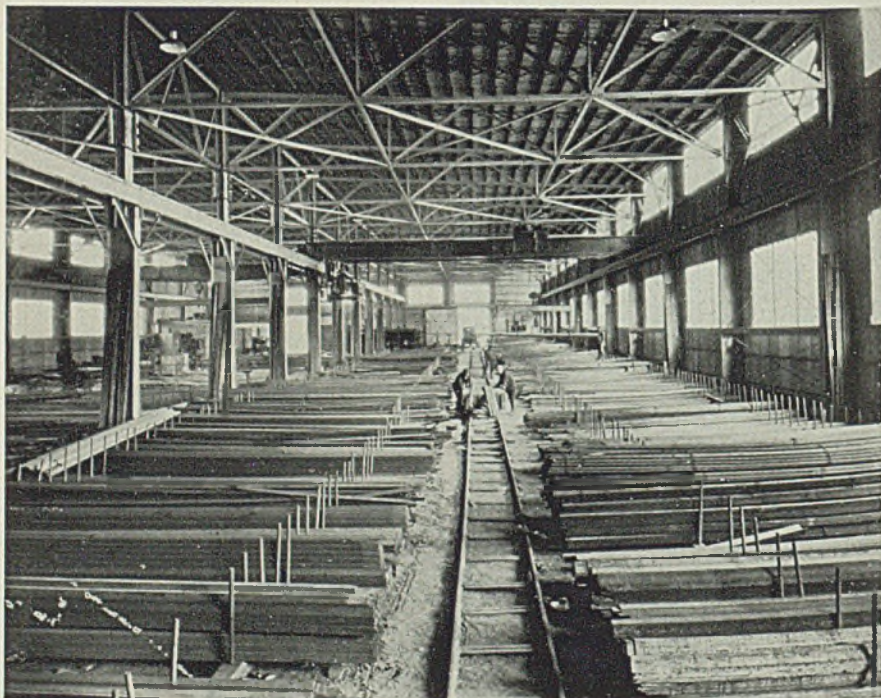
Replenishing Steel Warehouse Stocks Causes Headaches in WPB

IN the War Production Board everybody having a hand in replenishing steel warehouse stocks admits that this is an important and difficult problem. The allocations method recently applied to help toward this objective apparently has worked some degree of improvement but much remains to be desired. Steel warehouse stocks continue in a badly depleted condition, so that war contractors who depend on the warehouses have a difficult time in obtaining necessary materials.

Just as an illustration, one Eastern warehouse which usually carries an inventory of about 10,000 tons of steel, depending on how active demand is at the moment, now has a stock of about 3000 tons, out of balance as to different rolled sections and sizes. Due to this condition, which is quite typical of most warehouses, consumers frequently have to buy oversize sections and machine them down to required dimensions, work on which it is necessary to engage machines that ought to be in production. Because of difficulties and delays in getting replacements, warehouses now have but one-third to one-half of the individual items usually stocked.

Direct allocations for warehouses probably would bring the desired amount of relief. The present difficulty is that Priorities Regulation No. 12 prohibits allocations and now that war manufacturers with top priorities ratings must be taken

care of by the mills there is not enough tonnage for the warehouses which are left with a blanket A-1-k rating. Another difficulty is that under any effective allocations system applied to the warehouse industry as a whole there would be considerable duplication of



Many steel warehouses now have only one-third to one-half the individual items usually stocked

hers to become members of an advisory committee to serve as a liaison between OPA and resellers of iron and steel products.

Group will be known as the Steel Warehouse and Jobbers Advisory Committee.

Invited to serve were: A. H. Herron Jr., Jones & Laughlin Steel Corp., Pittsburgh; Everett D. Graff, Joseph T. Ryerson & Son Inc., Chicago; Leslie Worthington, Scully Steel Products Co., Chicago; Richmond Lewis, Charles C. Lewis Co., Springfield, Mass.; William G. Carter, Faittute Iron & Steel Co., Newark, N. J.; Peter Capio, Buchwick Iron & Steel Co., Brooklyn, N. Y.; Leslie Edgcomb, Edgcomb Steel Corp., Philadelphia; C. H. Bradley, W. J. Holliday & Co., Indianapolis; Henry Neef, Gate City Iron Works, Omaha, Nebr.; Phil Pidgeon, Pidgeon-Thomas Iron Co., Memphis, Tenn.; Frederick H. Lovejoy, Wheelock, Lovejoy & Co., Cambridge, Mass.; A. T. Galbraith, Crucible Steel Co. of America, New York; A. C. Castle, A. M. Castle & Co., Chicago; H. M. Taylor, Taylor & Spotswood Co., San Francisco; J. F. Rogers, Beals, McCarthy & Rogers Inc., Buffalo; Walter Doxsey, American Steel Warehouse Association Inc., Cleveland; Rufus Lea, Woodward, Wight & Co. Ltd., New Orleans; Sam Friedman, the Nottingham Steel Co., Cleveland.

Machine Tool Buyers Must Prove Needs

The Tools Division of the War Production Board now is "screening" materials requirements carefully so as to counteract any tendency on the part of machine tool and other manufacturers to "over-order". The division has become stricter in insisting that the armed services and foreign buyers under lend-lease prove the need for materials.

As an example turret lathes in the early days were ordered with a complete set of tooling for each machine. In the same way, lathes were ordered with taper attachments not always needed in the work to which they were to be applied. In many cases, for example, only three sets of turret lathe tools or attachments are being used to service, say, ten turret lathes. This procedure is made possible by the high degree to which interchangeability of parts has been developed by American machine tool builders.

The Tools Division has instructed the armed services to unearth such unused accessories and see to it that they are



John B. Hawley Jr.

PRESIDENT of Northern Pump Co., Minneapolis. Mr. Hawley effectively outlined before a Senate committee (STEEL, Sept. 14, p. 92) the difficulties of war materiel manufacturers forced to renegotiate contracts in the face of uncertain tax liabilities and costs

sold back to the original manufacturers in order that they may be put to work in war production. The armed services, in turn, are to hand these instructions on to all prime contractors and subcontractors involved. This move is expected to mobilize all sorts of cutting tools, chucks, gears, taper attachments, jigs and fixtures which now are idle or which can be spared.

The Tools Division also has launched

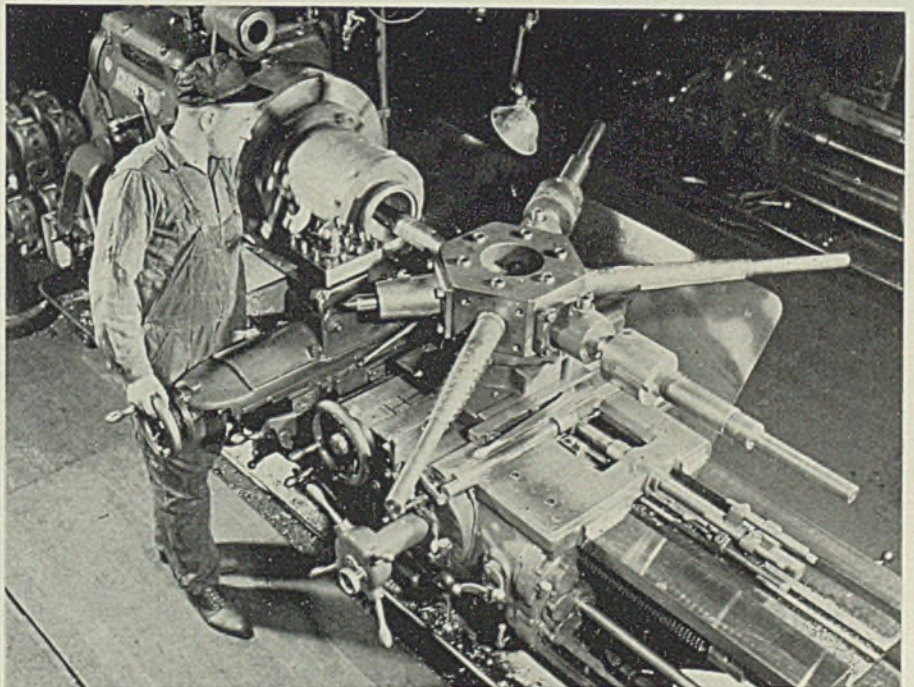
an effort to promote the organization of plant facilities for reclaiming cutting tools in order that their maximum productive performance may be obtained. Under this program, tools should be ground correctly so that they will stand up longer and at the same time turn out better work. Nicked tools should be re-dressed immediately for further use, rather than be left for treatment at some time in the indefinite future.

Construction Machinery Parts Manufacturers Granted Aid

Arrangements have now been made to grant assistance to manufacturers of construction machinery parts in obtaining raw materials for parts sold on an A-10 rating, Joseph F. Ryan, chief, WPB Construction Machinery Branch, has announced.

Previously, it has been necessary for some manufacturers to demand high ratings for orders for certain parts containing critical materials due to their inability to replace these critical materials with lower ratings. This caused considerable inconvenience to the purchaser of parts who was obliged to file applications for high preference ratings before placing orders with the supplier.

Under the new setup, it will no longer be necessary for purchasers of most construction machinery parts to file separate applications for ratings but instead they can extend on their purchase order A-10 under Preference Rating Order P-100.



Concentration of manufacture of highly specialized war plant equipment—including certain types of machine tools—already has paved way for governmental centralization of production of essential civilian goods in limited number of factories

New WPB Division Set Up To Aid Smaller Plants Obtain War Work

TO FACILITATE spreading of war work through the smaller manufacturing plants, WPB Chairman Donald M. Nelson has established the Smaller War Plants Division in WPB. Lou E. Holland, deputy chairman on smaller war plants, will head the new division.

This action formalizes the position of Mr. Holland as deputy chairman, a position created by the Murray-Patman act, which also created the Smaller War Plants Corp., of which Mr. Holland is chairman.

Mr. Holland has summarized his dual position and outlined his plan as follows:

"Owing to the fact that I occupy two positions, one as deputy chairman of the WPB on smaller war plants and the other as chairman of the Smaller War Plants Corp., there has been some confusion in regard to these two agencies which were set up by the Murray-Patman act to gain for the smaller units in American industry a larger place in the war production effort.

"The Murray-Patman act called upon the chairman of the War Production Board, through his deputy, 'to mobilize aggressively the productive capacity of all small business concerns and to determine the means by which such concerns can be most efficiently and effectively utilized to augment war production'. Other duties were specified 'with a view to insuring that small business concerns will be most efficiently and ef-

fectively utilized in the production of articles, equipment, supplies, and materials for both war and essential civilian purposes.'

"In addition to outlining in considerable detail the duties of the deputy, Congress also set up a financial institution known as the Smaller War Plants Corp. and gave that corporation power to give financial assistance to small manufacturing plants in qualifying for and executing war contracts and other orders essential to the war economy. The corporation was empowered also to act as a prime contractor for war goods.

Functions Separate, Aims Identical

"It will be seen, therefore, that the functions of the deputy and those of the chairman of the Smaller War Plants Corp. are quite clearly separate, although obviously identical as to objective. The Smaller War Plants Corp. is an instrument to be used when needed by the Smaller War Plants Division. . . .

"The Smaller War Plants Division will be decentralized in the same manner as other WPB activities and the bulk of our personnel will be situated, not in Washington, but in the field offices throughout the country. We are to enjoy the fullest co-operation of the procurement agencies, not only in Washington but through the field representatives of these agencies."

Additional Tightening of Metal Controls Contemplated by WPB

FURTHER studies that may result in additional restrictions on manufacture of products not directly required for the war effort are being made by the War Production Board. In addition, strenuous efforts are being made to have specifications changed so that available materials can be used where they will do the most good.

Limitation orders now cover a vast number of products, either curbing entirely or greatly restricting output. However, WPB has discovered what it regards as unnecessary "leaks," a case in point involving an appeal from a manufacturer of postage stamping vending machines for material for more than 20,000 units. These machines, along with

automatic restaurant and sanitary napkin vendors, are exceptions in Order L-27.

WPB also recognizes that various types of industrial machinery are not under control of limitation orders, notably 135 types of food processing machinery such as for bakeries and bottling plants. Other items not included are blowers, electric motors and controls, mechanical power transmission equipment, conveyors and safety switches.

It finds also that not all items in the critical list issued three weeks ago are directly under control of allocation and conservation orders, outstanding exceptions being tungsten carbides, electrolytic manganese and lithium. This critical list, incidentally, now covers a new

high total of 374 items, double the number on the March 12 list and 111 more than the total June 1.

Tendency apparently is toward closer allocation of all strategic materials. The Copper Branch now is scrutinizing every individual order for the metal and none is allocated until it is checked against monthly scheduled production of war equipment. The Production Requirements Plan is regarded as too loose-jointed for close allocation, as is the preference rating system itself.

Many WPB officials regard the PRP as already being outmoded and ineffectual. As in the case of copper, extremely critical items must be allocated to gear in with production of the war materials needed most. It has been found that nickel shipments to consumers have out-balanced outgoing shipments of finished material by 300 per cent. In the case of molybdenum, the percentage was 75 and in the case of chromium 140 per cent.

It has been found, too, that many material substitutions could well be made. Tight-wood barrel capacity is available to save 100,000 to 150,000 tons of steel now going into steel drums. Secondary aluminum, which is easier, could be used for primary. Steel could be substituted for copper in many cases. Revisions in tin specifications alone could save 1200 tons of that metal, it is estimated.

New Restrictions Imposed on Use of Alloys in Instruments

Limitation Order L-134, which restricts the use of chromium, nickel and their alloys to specified operating conditions of instruments, valves and regulators of the type used industrially, has been revised in the interest of further conservation.

Amended order also modifies some restrictions on operating conditions to permit use of equipment on which it has been proved no additional alloy material is required.

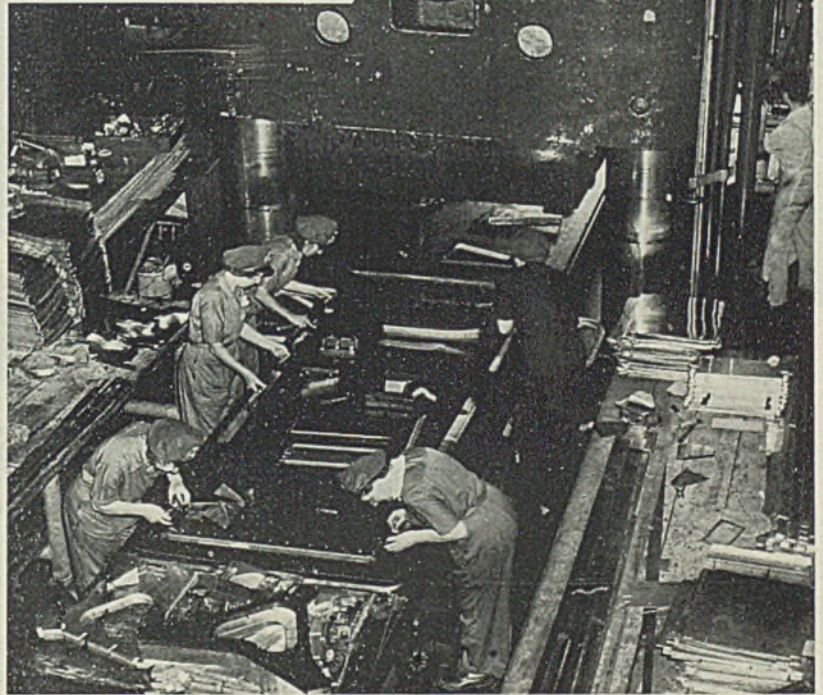
Ratings on which manufacturers or dealers are permitted to deliver new equipment have been raised from A-10 to A-1-c, and the required rating for deliveries of repair and maintenance supplies has been changed from A-10 to A-8 or higher, except on equipment needed by the Army, Navy, Maritime Commission or War Shipping Administration.

In cases where operating conditions set forth in the amended order are restrictive in nature, certification must be made by each person receiving delivery of equipment that the operating conditions will be followed. This certification is not required in cases where a person has purchased an item of equipment for use in a foreign country, except Canada.



Skillfully trained women gradually are replacing the men employes in the small shell department of Oil Well Supply Co., United States Steel Corp. subsidiary, in Oil City Pa. Training program was undertaken by the company months ago, and the girls now are gaging, threading noses, and inspecting the high explosive projectiles

Versatile in Many
Tasks Formerly
Done by Men



Hands skilled in kitchen tasks are proving as effective in operating one of the largest pieces of equipment at Republic Aviation Corp., the 4500-ton hydraulic press shown at the right. Women now are distributed through the plant, performing riveting, drilling, welding, sheet metal, engine line, electrical assembly and other operations



Women guards at the Glenn L. Martin plane plant in Baltimore have to be prepared to handle trouble. Here one of 16 "guardettes" recently hired is shown a jiu-jitsu hold by the plant's police chief. Girls accepted for the job must be 5 feet 5 inches tall, between 25 and 38 years of age and a bit on the robust side



NEW SKILLS *from* **VETERAN TOOLS**

WHAT'S true in the Army is just as true in the shop these days. New problems demand new skills from the man and from the tools. *Adaptability* has become a highly important word.

Bullard Vertical Turret Lathes were among the first to prove their fitness for wartime service. These veterans of fast production go right ahead handling such jobs as compressor cylinders and

pipe flanges, or switch to airplane and tank parts.

Five tooling stations on the main turret and four tools on the side head permit nine different operations at one chucking—two heads cutting simultaneously.

Use your Bullard V. T. L. for every job you can find—use it to its utmost capacity. Our field engineers will help you.

Bullard V.T.L. s have these characteristics

Vertical Design • Rigidity and Power
for Carbide Tools • 5-Face Turret on Main
Head • Centralized Control • Rapid Power
Traverse of Main Head • 4-Tool Turret on
Side Head • Simultaneous and Inde-
pendent Head Functions

THE BULLARD COMPANY

MIRRORS of MOTORDOM

Washington's menacing gestures ruled out by Baruch and associates in report on rubber. Will Japan ship loot of Malay to United States via South America? Little enthusiasm for Russian proposals

DETROIT

EPOCHAL in more ways than one, the Baruch-Conant-Compton report on rubber, accepted by the President, marks one of the first times that the threats and menacing gestures of the Washington oligarchy have been ruled out in favor of sound, independent advice backed by competent technical investigation. For in a large sense, the report was based on intensive study made by the tire committee of the automotive and rubber industries in recent months. Hence it can be inferred that the report has the full backing of these two great industries whose chief concern is to keep private cars on the road, even if not so frequently as has been the practice.

On the score of crude rubber stocks, two things in the report are of interest. First is the sharp reduction made in the stockpile of rubber in this country which the committee set at 578,000 tons, compared with earlier figures of around 1,000,000 tons. The latter figure included imports of 368,000 tons anticipated for this year, but the Baruch committee estimated imports over the next year and a half would be only 53,000 tons—a second point of concern. The rubber industry has figured imports would come close to 200,000 tons yearly over the next few years if India and Ceylon did not fall to the enemy. Apparently the Baruch committee has written off these imports almost in toto.

Rubber Via South America

Another phase of the question not mentioned in the committee report concerns the 6,000,000 or more new tires now on the shelf, frozen by government order. These would be sufficient to furnish one new tire to about 25 per cent of the nation's cars and still not interfere with military requirements, since these are filled through production now in force, from crude rubber in the stockpile.

Still another potentiality which the committee must have at least recognized is the appearance of rubber from the Malay peninsula in this country by way of South America. The Japs have now been several months consolidating their gains in the Far East and should be about ready to move some of the rubber output there to market. They cannot move it to Germany or Italy because these countries have subsidized their synthetic rubber industries and placed a tariff wall around imports of natural rubber; and Japan itself has no

use for the enormous tonnage of rubber which can be moved out of Malay. It would be interesting to know whether there have been any sinkings lately of merchant vessels with cargoes of rubber in the South Pacific. They would give an immediate clue as to what the Japs are going to do with their captured prize in Malay.

Tire conservation measures advocated by the Baruch committee are simply those which oil and rubber companies have stressed all this year, with the added impost of some rigid form of mileage control. In this respect it should be noted the committee does not recommend all drivers be limited to 5000 miles of travel a year. It simply states that the present average annual mileage of cars in this country has been 6700, which should be reduced by 25 per cent, or to about 5000 miles. Obviously the fairest way to do this would be to require every driver to cut his 1941 mileage total by 25 per cent in the year ahead. This would require some accurate census of mileage driven by each individual in order to arrive at his allotment under conservation. How falsification could be avoided is a difficult question.

Certainly it is not going to be equitable to cut a driver who runs up 25,000 miles a year regularly in more or less essential driving down to a fifth of this total, and at the same time permit a driver averaging only 3500 miles a year to increase his travel 40 per cent. This defeats the purpose of maintaining essential driving to avoid throwing inordinate loads on public transportation services.

Concern of the committee over failure to investigate the Russian synthetic impresses some observers as typical of college professors and college presidents. The rubber industry has not appeared too enthusiastic over possibilities of these "Dniener dandelions" as a source of synthetic rubber, feeling that the petroleum and grain resources of this country make them far more practical ingredients than any unknown weed. Investigation of the Russian activity would have to be a long-term program, such as the present guayule planting and study of rubber-bearing plants at Cornell University. Demands on time are too pressing to justify any great worry over unknowns.

Appointment of William M. Jeffers, president of the Union Pacific railroad, as rubber czar was somewhat of a sur-

prise in the motor capital. Those who know him, however, believe he is a hard-hitting executive capable of tackling this difficult problem.

Incidentally, the word in Washington is that Mr. Baruch spent something like \$50,000 of his own money in compiling the rubber report.

Regional WPB Activities Appear To Be Dwindling

Manufacturing facilities for more than \$8,000,000 worth of war work were located in Michigan during August by the local WPB office, according to D. J. Hutchins, regional director. Thirteen prime contractors for major war jobs were located by WPB field engineers, and other plants were found with facilities to handle 225 subcontracts. Machinery and equipment section of the WPB office handled requests from 389 companies, locating and arranging the transfer of 2159 pieces of equipment, including 1853 small tools, 269 major machine tools and 37 miscellaneous units.

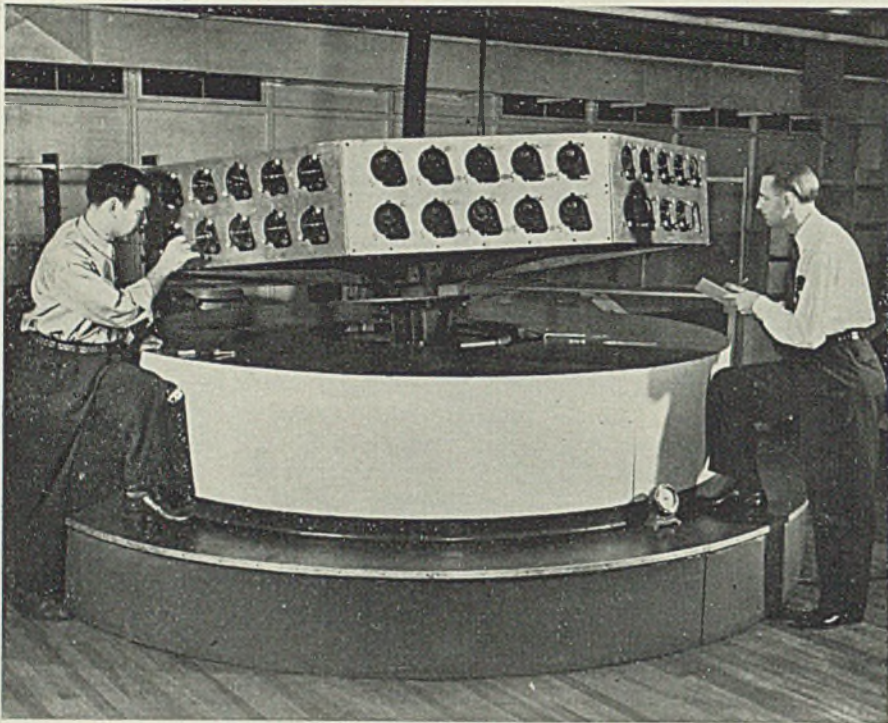
Indications are that activity of local offices of the WPB are tapering off to a decided extent, a natural aftermath of the placing of war contracts and the start of full production. A news sheet issued twice weekly by the office here has been cut to once a week and the mailing list trimmed.

It is logical to expect that once industry has emerged from the conversion stage and each plant knows its job, locates its equipment, arranges financing, etc., the need for a large WPB staff on the scene diminishes. But the prospect of reducing the size of a government bureau is something which seems to stump administrators today. Perhaps the easiest way would be to arrange transfer of engineers in the WPB into the plants which are now producing where they might help to ease the path of changes in designs and specifications, or adapt and improve conservation proposals.

Fisher Body Plant Ahead of Schedule on Gyro Instruments

Turnstedt Division of Fisher Body discloses it is three months ahead of schedule on production of Sperry gyro horizon and directional gyro indicators for airplanes, parts which require precision machining to extremely close tolerances, perfect polishing, utmost cleanliness and perfect balance. One small assembly in the instruments, for example, contains five minute ball bearings, each weighing 0.00015-ounce. Three thousand of them would just fill an ordinary thimble. A job entirely foreign to automotive practice, the Sperry equipment facili-

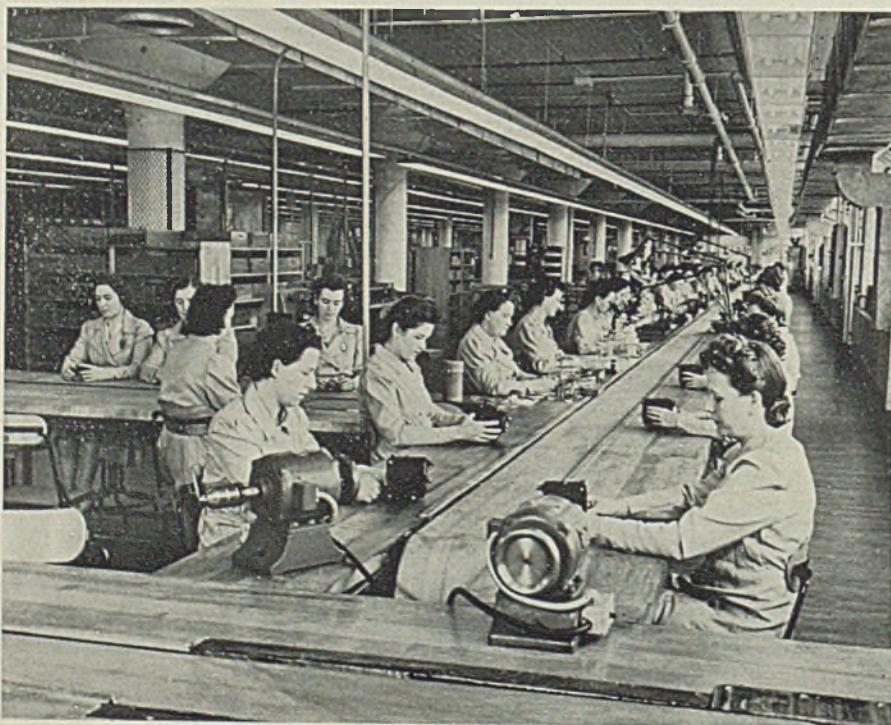
MIRRORS of MOTORDOM



Test machine which gives the roll, pitch and yaw of an airplane in flight to gyro horizon and directional gyro instruments being built by Fisher Body. To prove itself airworthy, each instrument must perform flawlessly while the machine revolves in a wobbling path

tates "blind flying" of planes under adverse conditions of weather and visibility. Ternstedt followed the usual policy of earmarking a building with little

more than four walls and a roof, then sending engineers to the Sperry plants to study the project, hiring and training employes, including large numbers of



Women are well adapted to the delicate task of building gyro horizon and directional indicators for Army planes, as shown here on one of the assembly lines at a Fisher body plant. So delicate are the instruments that all work is done in washed air, pressure-controlled rooms, and employes must wear lint-free clothing

watchmakers and women, locating equipment and building fixtures.

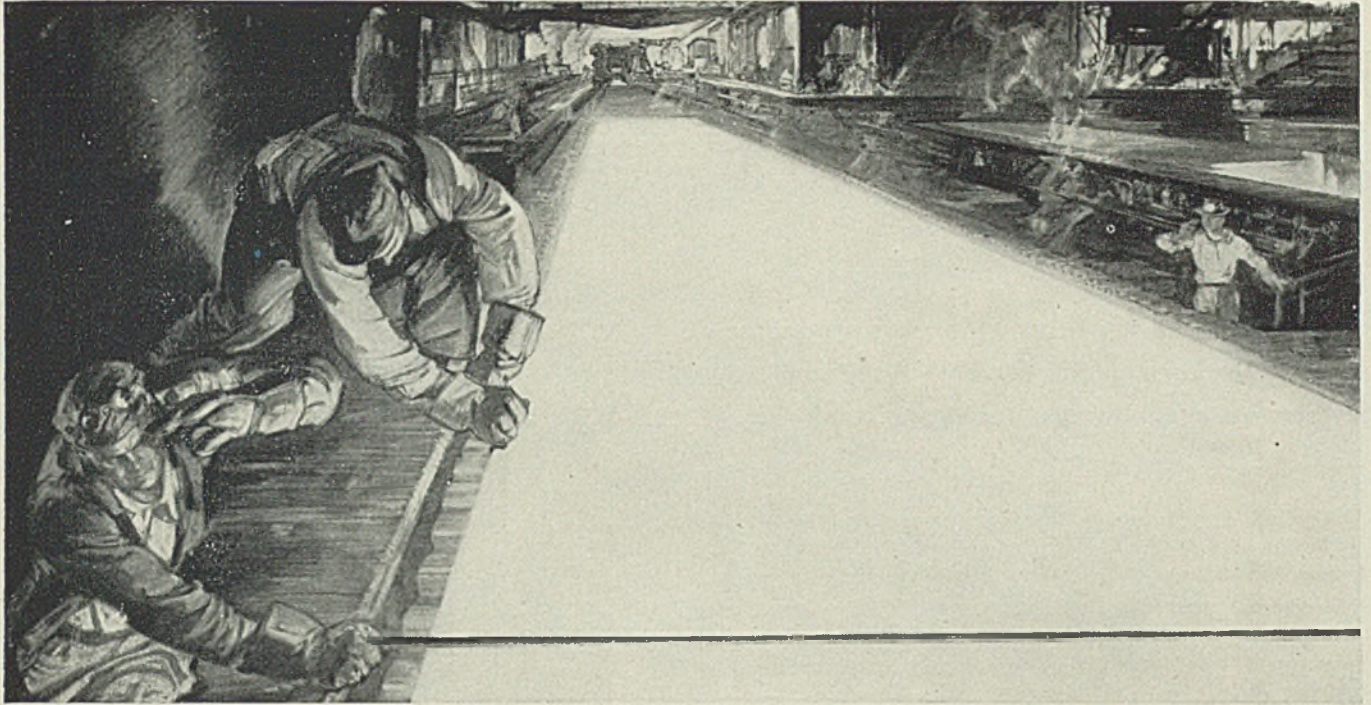
Tolerances on the gyroscope equipment obviously are critical, one key unit, the rotor, which spins at 12,000 r.p.m., being held to 0.0001-inch on the shaft. Innumerable tests must be made on moving parts, such as transferring from a temperature of 31 degrees below zero to 128-degree heat, checking on a special machine which simulates the roll, pitch and yaw of a plane, etc.

Rescinding of Double-Time Rates Draws AFL Protests

"Work or fight" is coming to be a slogan with some teeth in it, as instances are reported of recalcitrant employes suddenly finding themselves in the Army. In most cases these overnight inductions appear to be justified, but the policy of certain field agents of the U. S. Employment Service in threatening motor repair mechanics with induction into the army if they refused to quit their jobs and take up new employment offered by the service has drawn protests from the automobile dealers' association. These complaints have been translated into action by the director of the employment service who has issued an order for the coercion to stop at once.

About 50 small garage and basement metalworking shops in this area (and there are literally hundreds of them altogether) are being consolidated in a plant in Mt. Clemens, Mich., formerly a gray iron foundry and idle for the past year. Equipment of the small shops will be transferred to the new central location, according to Walter Kingsley, vice president of the Uhler-Cine Machine Co.

The President's executive order rescinding payment of double-time wages for Sundays and holidays, while assuaging the anguish of the UAW-CIO which had given up double-time for Sunday in a number of contracts, drew immediate complaints from the AFL and other unions operating under contracts which call for double time on Sunday. The UAW found itself squarely in the middle of a hot spot because in April it had agreed to waive this provision, yet other unions were still benefitting therefrom. After the President's failure to mention the matter in his Labor Day address, the UAW immediately stormed Washington with telegrams threatening fearful consequences, so the executive order was released immediately. The order doubtless stands, and contracts calling for Sunday double rates automatically will have this feature abrogated. Anyway, the AFL now has the ball; which direction they run is anyone's guess.



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FROM AN ORIGINAL DRAWING BY ORISON MACPHERSON

STEEL WORKERS MULTIPLY PRODUCTION OF WAR-STEEL PLATES

As U. S. artillery observers spot and check accuracy of gunfire, so steel inspectors in rolling mills measure and check accuracy of war-steel plates which their fellow workers are producing white-hot in endless procession.

Thousands of skilled steel men all along the lines of America's plate mills are setting up almost unbelievable production records. They are making these records on regular plate mills and also on continuous strip-

sheet mills quickly converted to meet the emergency. On the continuous mills plate production has actually been multiplied several times.

Men of the J&L mills in Cleveland and the Pittsburgh district are doing a record job of delivering steel plates in a continuous stream—for the ship-builders, for the manufacturers of tanks, guns and other fighting equipment. No time is being lost or material wasted on the steel front.



JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH, PENNSYLVANIA

PARTNER TO INDUSTRY IN WAR PRODUCTION



Ack-Ack Production Increased Thirty-Fold

Bofors 40-millimeter cannon in mass production at 12 Chrysler Corp. plants for both Army and Navy. Automotive assembly line technique employed

DETROIT

BOFORS 40-millimeter antiaircraft cannons now are in mass production at Chrysler Corp. plants here. Each of these guns is made up of more than 5000 individual pieces.

Mechanical and engineering talent of 12 Plymouth, Dodge, DeSoto and Chrysler automobile plants are employed on the project and how far automobile assembly line methods have been employed may be judged by the accompanying photographs.

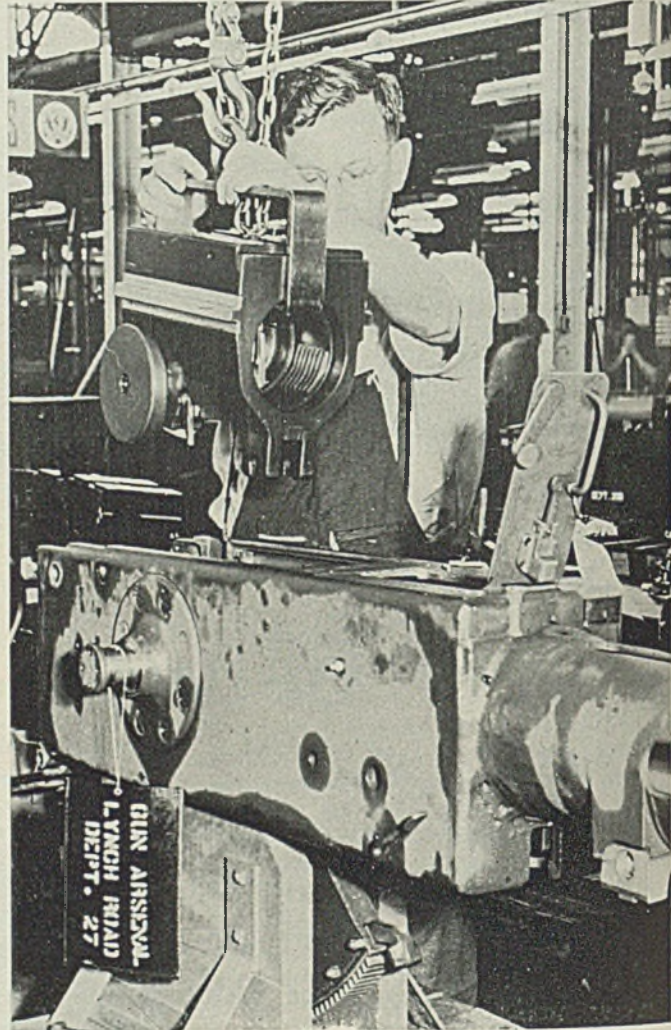
Production was started in February of this year, with output substantially in two figures. March production was five times that of February; April's was ten times that of February; May, twenty times that of February; June, twenty-five times that of February; July, thirty times that of February; and August still more.

The guns are made both for the Army and Navy. Navy guns are double-barrel models, and the Army types have single barrels. Barrels are both cast and forged types, depending on which service they are for.

The Bofors cannon originally was a Swedish design which was turned over to Chrysler engineers who tooled it up for mass production, making numerous refinements and improvements.

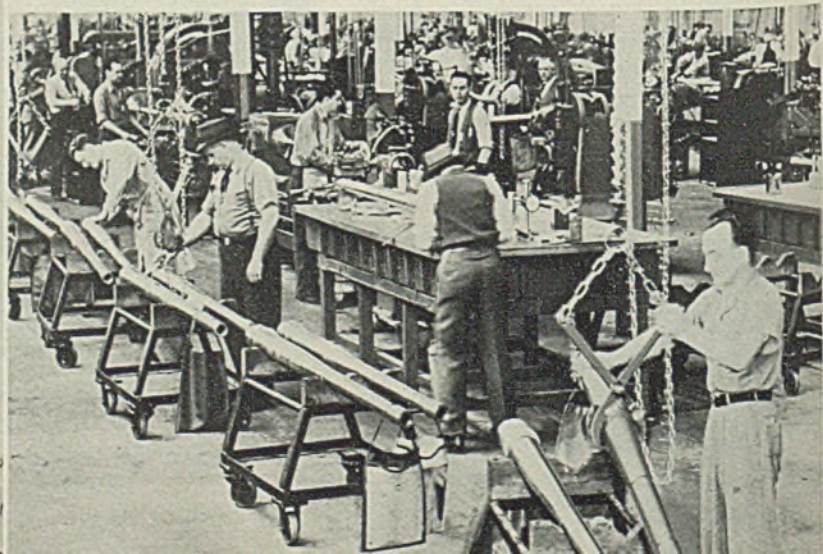
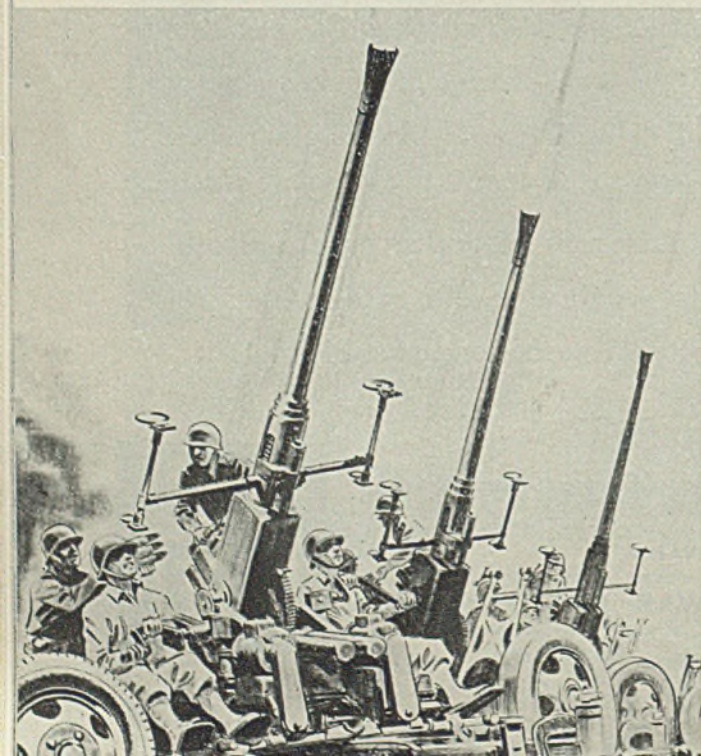
Artist's conception of a battery of Bofors guns in action is shown below

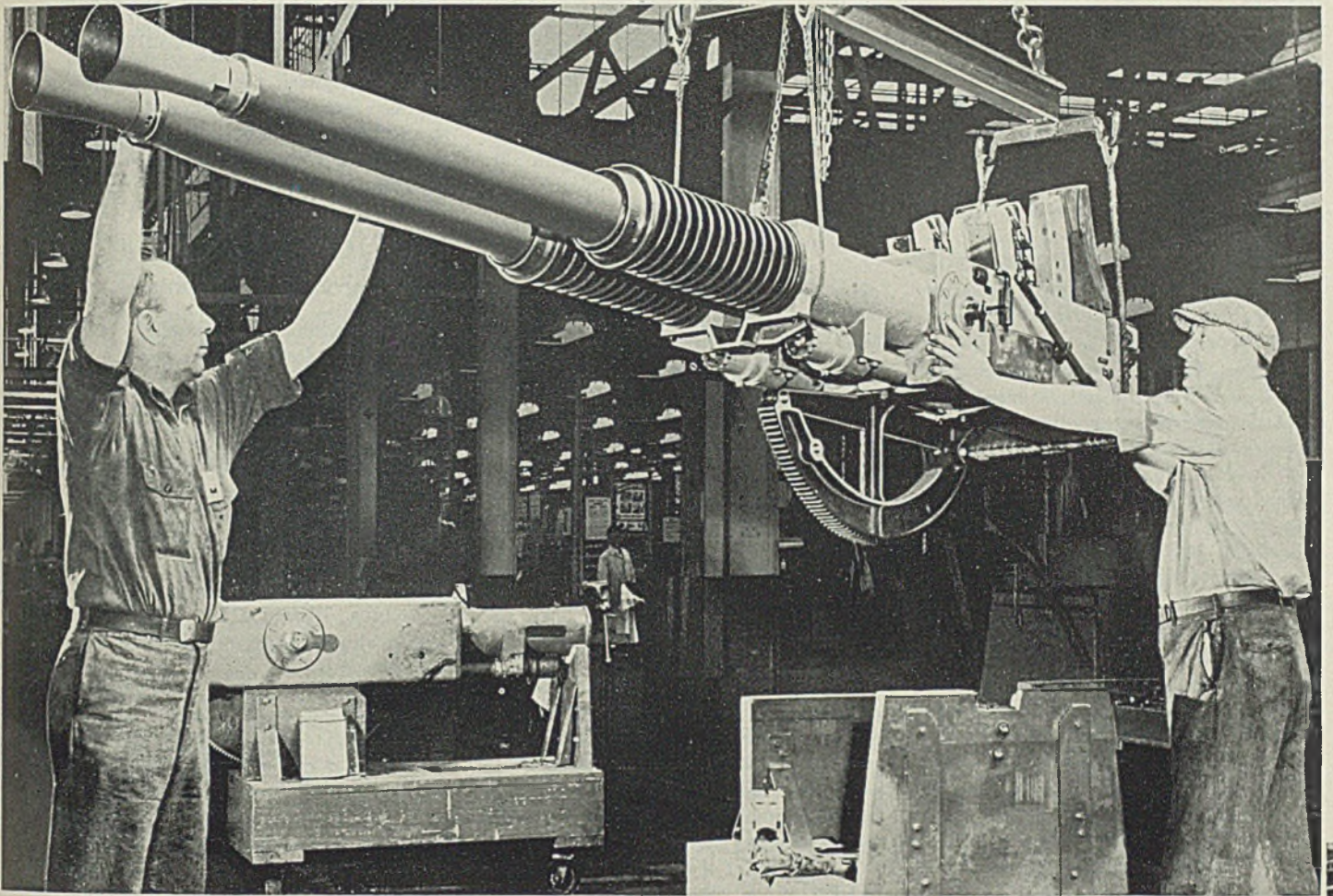
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Lowering breech ring of Bofors ack-ack gun into its housing on a Chrysler assembly line, above

Below, cast or forged barrels, weighing from 400 to 570 pounds, rough, are machined, bored, rifled and finished by the thousands



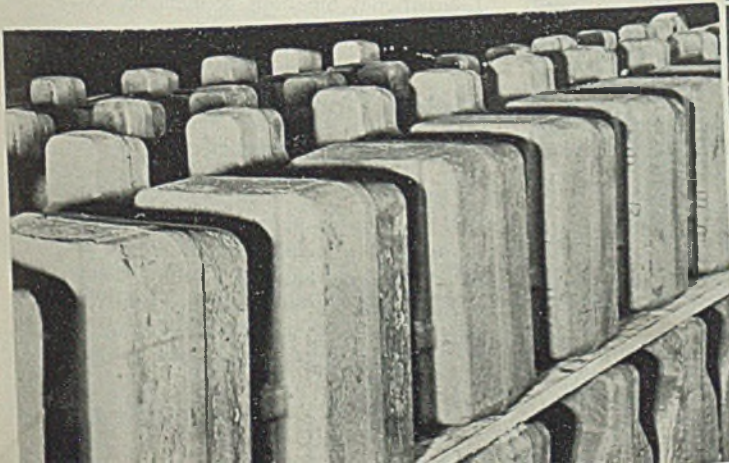
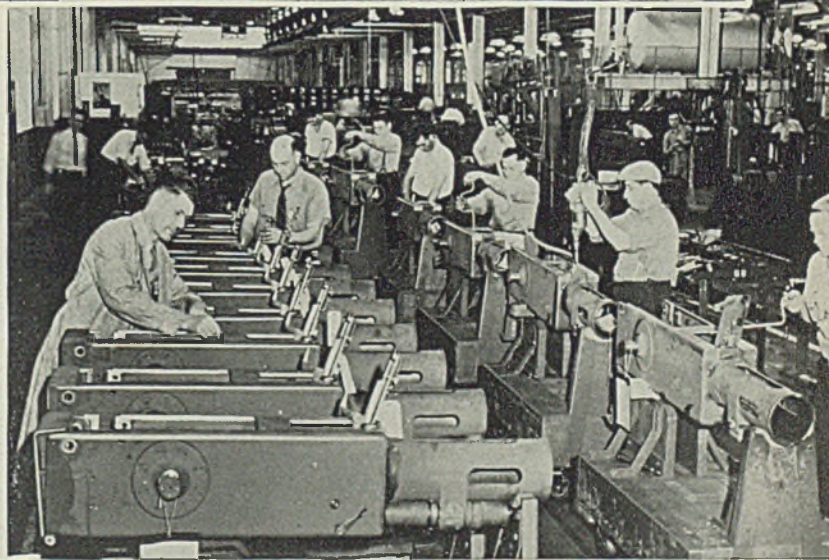


Complete pair of guns for the Navy, above. These need only to be test fired before being mounted on ship

Assembly line technique is shown at upper right where casings for Army ack-acks are starting down the line

Same technique is used in building Navy guns, lower right, but the guns are assembled in pairs

Steel forgings for breech rings, below, weigh more than 300 pounds when received by Chrysler assembly plants



ARMY-NAVY AWARDS

United's Ceremony Witnessed by 1500

UNITED Engineering & Foundry Co.'s Youngstown, O., works now flies the coveted Army-Navy "E" pennant. It was formally presented Thursday afternoon, Sept. 10, by Lieut. Col. Theodore H. Eickhoff to F. C. Biggert Jr., vice president of United, who accepted in behalf of George T. Ladd, the president, who was ill.

Fifteen hundred persons, including Army and Navy officers, industrialists, United Engineering executives and employees, attended the ceremony which was held in the high bay building designed especially for erection of presses for forging armor plate for the Navy. A pair of 105 mm. howitzers built by the company for the Army flanked the speakers' stand.

Colonel Eickhoff, who is chief of Cleveland ordnance district's procurement service, said men home from the war have been shocked by the indifference they found at home, with people wrangling about wages and hours and sugar rationing.

Lieut. F. W. Crooks, U. S. N., pointed out that the "E" long has stood for "Excellence" in the Navy, and Navy men vie for the right to carry it on their ships.

"It is only fitting therefore," he said, "that it should also serve as a symbol of excellence for war plant workers, who are in truth the men behind the guns."

He presented the first of the "E" pins to Michael Flannery, an employe 53 years; William H. Edwards, with 40 years; Alonzo Stevens, 38 years and Joseph Grady, 29 years.

United Engineering's Youngstown plant, whose peacetime output is steel plant equipment, won the award for outstanding work in building howitzers, armor plate presses, presses for forging various ship parts, and rolling mill equipment.

At Towmotor Co.

Accomplishments of the Towmotor Co., Cleveland, in building equipment for the fighting services were recognized Sept. 14 in a ceremony at company's plant celebrating the Army-Navy "E" award.

The banner was received from Col. William H. Clopton Jr., of the Army's Service of Supply, by Lester M. Sears, managing partner of the company, who turned it over to Elmer Redding, employe representative and manager of production planning. Presentation of "E" lapel emblems to individual workers was made by Capt. R. P. Schlabach, U.S.N., inspector of naval material for the district.

Flanked by Col. Harold Reedall, chief,

Cleveland ordnance district; Lieut. Col. R. W. Reuter; Frank J. Lausche, mayor of Cleveland; and officials from various war services, Col. Clopton complimented management and workers for a remarkable achievement attained in the course of a 750 per cent expansion of the organization.

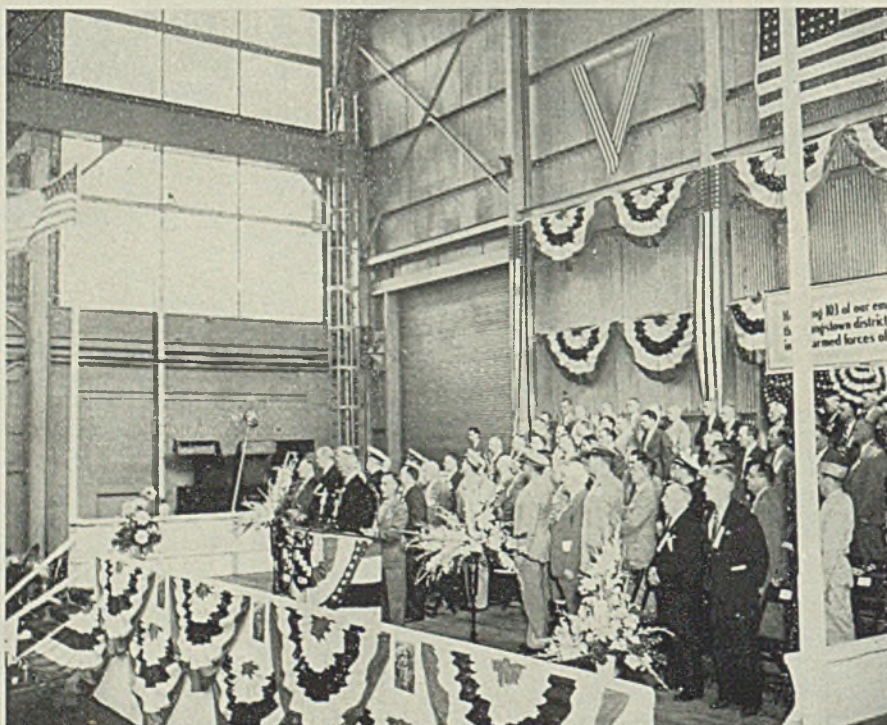
Thirty More Plants Named To Receive "E" Pennants

Thirty additional industrial plants were named last week to receive the joint Army-Navy "E" award. Those in the metal-working and related industries are:

- Boeing Airplane Co., Wichita Division, Wichita, Kans.
- Hayes Industries, Jackson, Mich.
- Mount Vernon Die Casting Corp., Mount Vernon, N. Y.
- General Motors Corp., Packard Electric Division, Warren, O.
- Universal Building Products Corp., Dallas, Tex.
- Wallace Barnes Co., Division of Associated Spring Corp., Bristol, Conn.
- Waverly Tool Co., Irvington, N. J.
- T. H. Wood Co., Inc., South Coventry, Conn.
- N. A. Woodworth Co., Ferndale, Mich.
- American Rolling Mill Co., for plants in Zanesville, Middletown, and Hamilton, O., Butler, Pa. and Ashland, Ky.
- E. I. du Pont de Nemours Inc., Neoprene Plant, Rubber Chemicals Division, Deepwater, N. J.
- National Carbon Co., Clarksburg Plant, Clarksburg, W. Va.
- National Wire Die Co., New York.
- Vanadium Corp. of America, Bridgeville, Pa.
- American Brake Shoe & Foundry Co., Upset Plant, American Forge Division, Chicago.
- Continental Roll & Steel Foundry, East Chicago Plant, East Chicago, Ind.
- Duiron Co. Inc., Dayton, O.
- Goodvear Engineering Corp., Hoosier Ordnance Plant, Charlestown, Ind.
- Hobart Bros. Co., Troy, O.
- American Smelting & Refining Co., Hayden Branch, Hayden, Ariz.
- International Smelting & Refining Co., Miami Plant, Miami, Ariz.

Metals Plants Stage War Bond Campaigns

September war bond campaigns are underway in many major metalworking plants and a number already have attained the goal outlined by the Treasury Department of 90 to 100 per cent participation, with employes investing at (Please turn to page 115)



Army and Navy officers, officials of United Engineering & Foundry Co., and guests assembled for presentation of Army-Navy "E" at the Youngstown, O., plant on Sept. 10. In front of the platform in this high bay press erection shop, were 1500 employes, with their families and friends

Ready-Power Co. Expands Manufacturing Facilities

Ready-Power Co., Detroit, increased production so that in August it was 150 per cent greater for industrial truck power units and 400 per cent for diesel and gasoline types than at the beginning of the year.

Plans early in the year called for a brick, steel and concrete building covering 33,000 square feet and three temporary wooden buildings with an additional 11,000 square feet, to house the power plant division. Priority difficulties prevented erection of the former and Detroit building regulations do not allow wooden structures of more than 5000 feet floor space. Accordingly seven wooden buildings 60 x 80 feet were erected, each housing a department. The power plant division has occupied the new plant, increasing its floor space six times. The industrial truck division has expanded about 30 per cent, to occupy the plant formerly used by the power plant division.

A special engineering department has been formed by the lamp division of

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., to study the application of recently developed light sources to the expanding lighting needs of the nation. Company announced the new unit will plan for present-day war plant use and post-war expansion of requirements for fluorescent, mercury vapor and other sources. D. W. Atwater, former manager of commercial engineering, will head the department.

Chisholm-Ryder Co. Inc., Niagara Falls, N. Y., has acquired the Niagara Searchlight Co. and will operate it under the name of Niagara Searchlight Co., division of Chisholm-Ryder.

Smith Tool Works Inc., Bucyrus, O., has changed its corporate name to Smith Tool & Engineering Co. The name Smith Incubator Corp. will be retained as a subsidiary of the parent company, and its activities confined solely to sale of incubators.

Ohmite Mfg. Co., manufacturer of rheostats, tap switches, chokes and attenuators, has again expanded its factory space and production facilities.

This is in addition to the increase in plant size made a short time ago.

Park Chemical Co., Detroit, has been appointed exclusive sales representative for the Thurner carbo-cleaner in the territories east of the Mississippi river, except Iowa.

Steelworkers' Share-a-Ride Plan Ready for Trial

Registration of automobiles of Weirton Steel Co. employes in the Share-a-Ride plan is being rapidly completed. The plan was originated recently by a labor-management transportation committee at Weirton, W. Va.

An official red, white and blue windshield sticker will appear on cars of registrants. While participation in the plan does not guarantee that the owner will be able to get replacements for worn-out tires, the transportation committee has served notice that the Weirton Rationing Board will be unable to grant replacements to any individual, no matter how vital his job, if he is not a member of the Share-a-Ride plan.

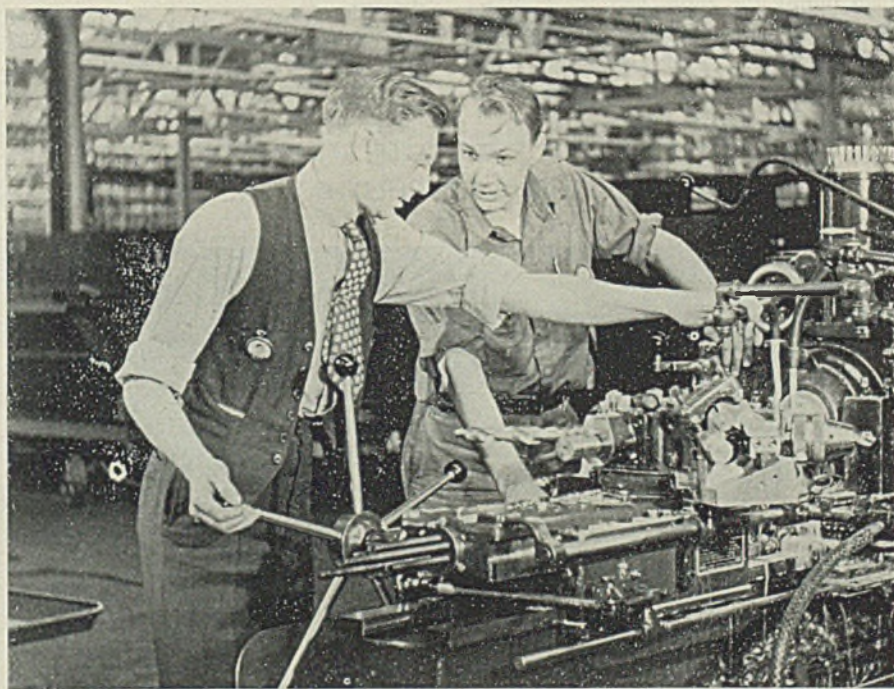
MOVIE HELPS INTRODUCE NEW EMPLOYEES TO WAR JOBS

To assist new employes obtain an overall picture of their jobs and how they fit into the war production program and to cultivate better relations between men and management, Thompson Products Inc., Cleveland, daily shows a five-reel sound film, "Men, Management, Production." Filmed in the company's plants and offices, the movie is said to be accomplishing its purposes.

Film first illustrates the vital importance of producing to win the war and emphasizes that defeat means slavery. How the individual's effort ties into the whole picture is shown in a scene in aircraft engine repair shop illustrating the part Thompson valves play in the construction and maintenance of engines.

Job stability is treated frankly by scenes showing the company's position before the war and today. That the concern may have an excess of manpower when the armament effort is finished is freely admitted, but the film shows what preparations, especially in engineering and research, are being made to prevent widespread dislocation.

Another scene depicts employment procedure. Every step of the company's manufacturing operations is traced and the new employe is shown what kind of



Typical operations scene from sound film shown to new employes at Thompson Products plant

jobs are available, to aid him select that for which he is best fitted.

Mechanics of obtaining a better job are discussed, as are wage rates and

bonuses and how they are determined.

Other subjects treated are the precautions taken against sabotage and the danger of idle conversation.

Industrial Capacity Doubled; Now Ships Machine Tools to U. S.

TORONTO, ONT.

EXPANSION of war plants in Canada in the past three years has practically doubled industrial capacity as it existed at the close of 1939, and at the same time has introduced many lines of manufacture never before represented.

According to officials of the Department of Munitions and Supply, guns provide a good example of adjustment to the needs of war. Before 1940, Canada's experience in this line was limited chiefly to a few small arms. Today nine types of guns with 11 different mountings are being made. One of the largest plants in the world for production of 25-pounders has been built, the process covering all steps from scrap to the finished gun. Deliveries started a few months ago on 3.7-inch anti-aircraft guns, the largest and most complicated arms Canadian builders have attempted. Bren guns, antitank guns and small arms also are in production.

Millions of shells and billions of rounds of small arms ammunition are being made annually in 40 plants. Linked with munitions production is a large development of chemical and explosive manufacture, first six month's output being greater than during the entire first World War. One ammunition filling plant occupies 450 buildings on a 5000-acre site.

The automobile industry is devoted en-

tirely to production of war vehicles and more than 250,000 such units have been completed. More than 100 types are being made, ranging from troop carriers to workshops on wheels. Two models of tanks, the medium-light 18-ton Valentines and the heavier Ram tanks, are in production.

Builds Aircraft and Ships

Aircraft manufacturing experience dates back to the 1914-18 period, when about 3000 planes were made. Now Canadian aircraft plants occupy about 500,000 square feet of floor space, with 50,000 employes and production of 400 planes a month, except for engines, which are imported, mainly from the United States. Nine types of planes are being manufactured, ranging from the Fairchild Cornell trainers to four-engined long range bombers and Curtiss Navy bombers.

Canadian shipyards launch a 10,000-ton cargo vessel every few days under a program calling for 172 merchant ships costing \$325,000,000. About 200 combat ships have been launched and work is proceeding on 700 more navy units, ranging from collapsible assault boats to destroyers.

Canada has reached the peak of wartime industrial expansion and future enlargements will be through utilization of

existing non-essential plants. Maximum production will be reached early in 1943, when practically all industrial effort will be confined to war materials production. Harry J. Carmichael, co-ordinator of production in the Department of Munitions and Supply, believes peak production will be reached in February. He states plans are tied closely to those of the United States and a constant process of standardization is being carried on.

Announcement is made by the Department of Munitions and Supply that Canada, once dependent almost entirely on Great Britain and the United States for machine tools, now is exporting tools to those countries and has increased production since the outbreak of the war by more than 800 per cent. Four general types of machine tools are being made in a wide range of sizes and almost half goes to war industries in the United States.

Machine Tools Are Salvaged

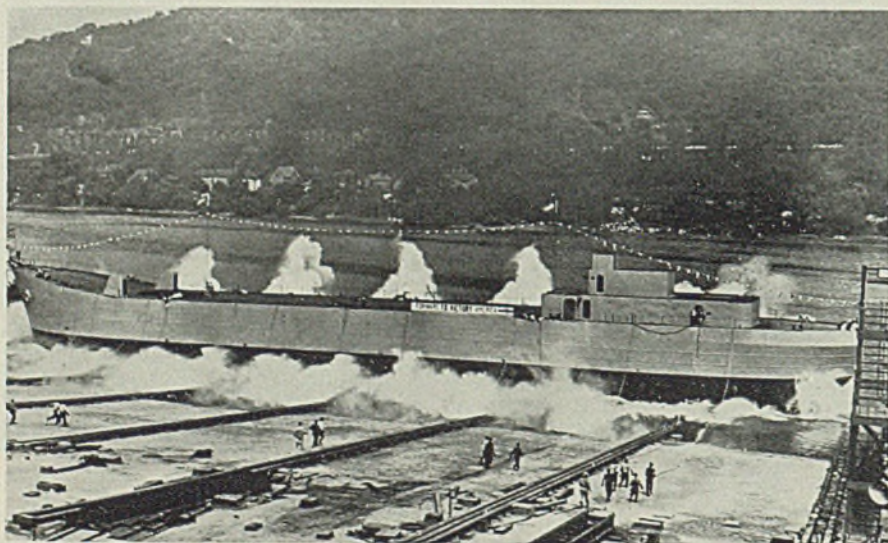
At the beginning of this year Machinery Services Ltd., a government-owned company, was established to utilize the services of skilled refugees from enemy countries in reconditioning and rebuilding machine tools. Cutting Tools & Gauges Ltd., another government-owned company, is engaged in reconditioning and salvaging tools and has placed in useful service thousands of dollars worth of tools which otherwise would have been valuable only for scrap. Co-ordination of production and procurement of machine tools is handled by Citadel Merchandising Ltd., also government-owned.

Use of copper and other nonferrous metals for extensions to public utility services and other uses has been curtailed to conserve supplies for munitions and other war materials. Necessary maintenance and repair, emergency requirements of the armed forces and essential military and civilian direct connections from existing lines are exempted.

The government has taken complete control of all sales of typewriters and no new machines can be sold to civilian users, while sales to industrial concerns engaged in war production can be made only under special permit. Machines more than 15 years old are exempted from the regulation.

Manufacture of metal road and traffic signs, name plates, advertising signs and other metal plates, tags and discs has been prohibited. The new order amends a previous regulation which permitted production of metal signs of less than one square foot area. The order does not affect manufacture of articles from precious metals.

TANK LANDING SHIP LAUNCHED AT INLAND YARD



LANDING ship for tanks is launched in the Ohio river at the Neville Island, Pa., yards of Dravo Corp. First of many of its type being built by Dravo and other shipyards, the vessel is similar to that used by the Marines in attacking the Solomon Islands. NEA photo

Pattern for Organization and Training of Personnel Outlined

AIR raid protection plant for steel mills, patterned after organizations already in effect in some plants, has been outlined for the industry by the American Iron and Steel Institute.

The first step is to establish and train an organization recruited from the regular personnel. This staff, says the institute, should function on a 24-hour basis. For all except perhaps the very large plants the defense co-ordinator need be the only member of the air raid protection staff to devote full time.

Qualifications for the co-ordinator include organizational and executive ability in high degree, thorough familiarity with plant layout and operating personnel, and full confidence of the management.

The institute emphasizes that it is fundamental a comprehensive and efficient organization be established. Frequent drills and tests are essential to the success of any protection system. Such drills and tests should be conducted first on a departmental basis and later made plant-wide in scope.

Division chiefs should be selected from the persons normally qualified to fill such posts. Thus the company doctor is the logical man to be appointed as chief of the medical division. The regular head of the plant police force should be the chief of police division.

Methods of blacking out steel plants in case of an emergency air raid are

described. The War Department is said to have approved the recommendations.

Experience gained by British and other European steel mills was of great value in working out rules for the American steel industry, but in the main the air raid protection plan represents the careful work of an Institute committee over a period of months.

Co-ordination Is Requisite

"To black out a steel plant quickly and effectively requires a high degree of co-ordination among a selected group of employes," it is stated.

"Coke plant operations are such that in an emergency it is possible to enter a temporary work stoppage period up to one hour without an actual loss of production over a certain period of time. This is possible because coke ovens not pushed on schedule may be made up through increased rate of charging after the emergency has passed.

"In normal blast furnace operations," in pig iron production, "furnaces are usually cast on a five-to-six hour cycle. When advance warnings are received, it is possible to delay the casting operation at least one hour by reducing the amount of wind blown. This operation is often referred to as 'fanning' or 'furnace on check'.

"This procedure assures the elimination for the period involved of visual

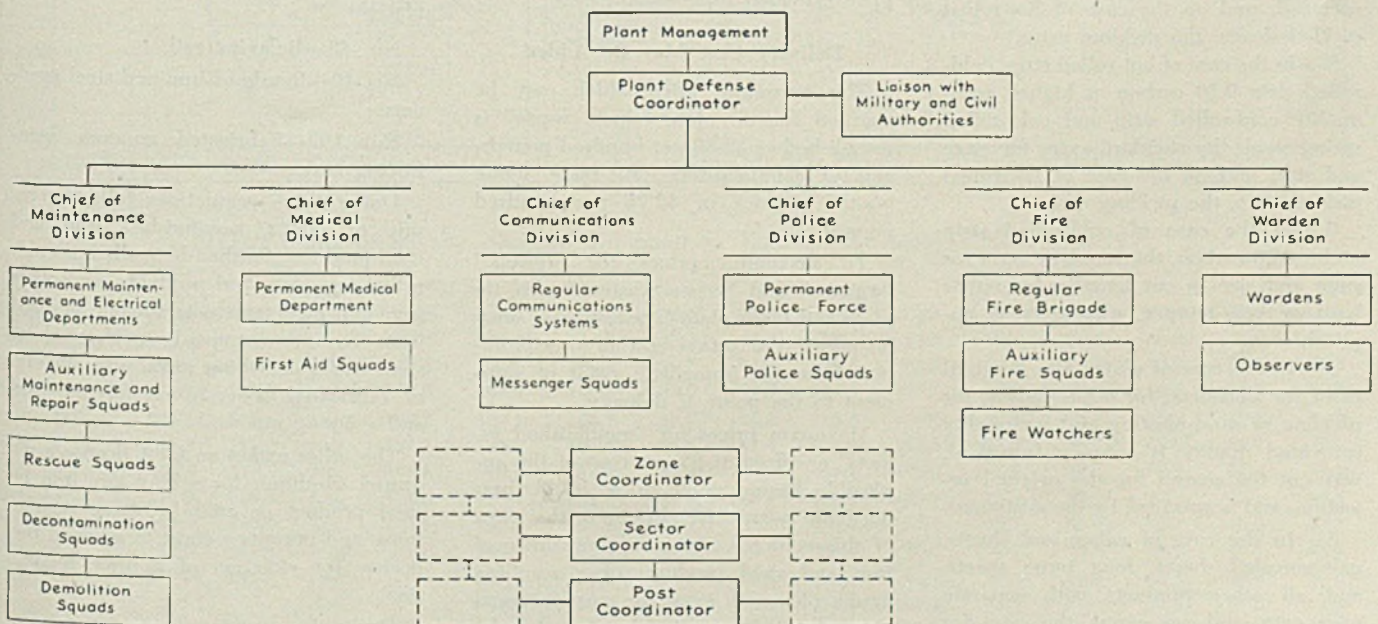
illumination from hot metal, slag or burning gas. Any hot metal or slag in ladle at the blast furnace would be covered with coke dust and this would immediately adequately eliminate any glow from this source. Pig machine operations would be immediately stopped, with all hot pig promptly quenched below the glow point.

"A normal bessemer converter operating cycle lasts from 10 to 20 minutes. In case of an air raid alarm the converter can be emptied and the vessel turned nose down so as to eliminate the glow from the vessel itself. Where necessary, the nose of the vessel can be mudded and bricked up, or otherwise covered. Hot metal in ladles can be held under cover and, when necessary, covered with coke dust. Hot steel in ladles will be immediately released into molds and the tops of the molds covered. Ladles which are still glowing will be moved under cover. Any glow from cinder pans would be immediately dissipated by spraying with water."

The normal operating cycle of open hearth operations, which produce most of the nation's steel, is 10 to 12 hours, although certain special processes take less time.

"In case of an air raid alarm" steps can be taken to "black" the furnace or, in other words, delay its tapping time.

"Upon receipt of an air raid alarm, finishing mills will cease drawing heated slabs, blooms or billets. Gas in furnaces will be reduced or shut off, and such openings in the furnaces will be mudded or bricked up as required. Hot steel in the mills will be rolled and held under cover on the hot beds."



Typical air raid organization chart for a steel plant, above, is suggested by the American Iron and Steel Institute. Plan should not be considered inflexible as far as personnel is concerned

Rejected Steel Ceilings Set at 65-85 Per Cent of Prime Products

MAXIMUM prices for rejected flat-rolled and semifinished iron and steel products have been established by the Office of Price Administration at levels ranging from 65 to 85 per cent of the base prices for comparable products of prime quality, plus a percentage of a limited number of trade extras.

The new maximum prices amount to a 15 to 35 per cent reduction in ceiling prices of rejected iron and steel products. Previously they could be sold at levels as high as those established for top-quality products.

The new prices for rejected items are provided in Amendment No. 7 to Revised Price Schedule No. 6, iron and steel products, and became effective Sept. 17, 1942.

For purposes of establishing the maximums, products not meeting prime requirements are classified by OPA as "rejects," "wasters," "waste wasters," and under other names known to the trade.

"Rejects", "Wasters" Defined

Ceiling prices for "rejects" are fixed at 85 per cent of the applicable basing point price for a prime product at the basing point nearest freightwise to the point of shipment, plus 85 per cent of such of the following extras as may be applicable:

1.—In the case of hot-rolled sheets and cold-rolled sheets, the standard extra for 32-inch by 96-inch sheet in the gage specified; and, in the case of hot-rolled pickled sheets, the pickling extra.

2.—In the case of hot-rolled strip, cold-rolled strip 0.26 carbon or higher, commodity cold-rolled strip and cold-rolled spring steel, the standard extra for gage and size; and, in the case of hot-rolled pickled strip, the pickling extra.

3.—In the case of cold-rolled strip under 0.26 carbon, the standard extra for gage and size in cut lengths, for either hard or soft temper, whichever is applicable.

4.—In the case of plates, the standard extra for thickness, for wide widths, for pickling or sand-blasting and for quality (provided quality is actually furnished, was not the reason for the original rejection, and is specified by the customer).

5.—In the case of galvanized sheets, galvanized sheets, long terne sheets, and all other products with separate gage extra and size extras, the extra for gage.

"Rejects" for pricing purposes are de-

finied as flat-rolled iron or steel products of a designated specific size and gage, and which have minor imperfections such as minor surface defects, lack of flatness, camber, off or fluctuating gage or temper and similar imperfections, but which may be utilized without requiring unusual processing in order to remove or minimize injurious defects.

Maximum prices fixed for "wasters" are the aggregate of 75 per cent of the applicable basing point price at the basing point nearest freightwise to the point of shipment plus 75 per cent of the foregoing extras. "Wasters" are defined as flat-rolled iron and steel products which are of a designated specific gage but are unassorted to size, and which otherwise are of the same quality as "rejects."

Ceiling prices for "waste wasters" are 65 per cent of the applicable basing point price at the basing point nearest freightwise to the point of shipment plus 65 per cent of the foregoing extras. "Waste wasters" are products unassorted as to gage and size, and which have serious imperfections. The amendment provides that in computing the maximum unit price for any lot of "waste wasters" containing a range of gages, the maximum price for the gage within the range carrying the lowest gage extra shall be the price used in determining the maximum price for the entire lot. It further provides that the maximum price for plates which are "waste wasters" shall be the price provided for "wasters."

Delivery Cost May Be Added

The maximum price which may be charged for tin plate "waste waste" is established as \$2.80 per hundred pounds, and for manufacturers' terne plate "waste waste" a price of \$2.25 per hundred pounds.

To maximum prices for "rejects," "wasters" and "waste wasters," also tin plate and terne plate "waste waste," may be added the actual cost of transportation from the immediate point of shipment to the point of delivery.

Maximum prices for "semifinished rejects" are fixed at 85 per cent of the applicable basing point price at the basing point nearest freightwise to the point of shipment for an identical quantity of iron and steel products of a rerolling grade, plus such extra for cross-sectional area as may be applicable, and plus the actual cost of transportation from the immediate point of shipment to the

point of delivery. "Semifinished rejects" are defined as partly-finished iron or steel products, such as blooms, billets, tube rounds and slabs, which have been rejected because of poor surface condition, lack of internal soundness or other defects which render the steel unsuitable for sale or use by the mill as a prime product.

The maximum delivered price for any secondary or off-grade iron or steel product for which a maximum price is not established by the amendment is to be an amount not in excess of maximum delivered prices established in Revised Price Schedule No. 6 for an identical quantity of the same iron or steel of prime quality.

The amendment points out that any product which has been rejected from the original order for which it was rolled may be applied against a different prime order and sold at the full applicable prime price if it fulfills in every respect the quality and other requirements in the second order, and if it may be used by the purchaser without additional processing not usually performed to adapt it to his requirements.

Steel Warehouses Brought Under OPA Licensing Control

Warehouse and other resellers of iron and steel mill products and some finished iron and steel products have been brought under uniform licensing control by OPA in Supplementary Order No. 17. This automatically licenses all sellers of products for which ceiling prices are established by any of the following regulations:

No. 46—Relaying rail.

No. 49—Resale of iron and steel products.

No. 159—Fabricated concrete reinforcing bars.

Under these regulations falls the resale of ingots, semifinished iron and steel products, finished hot-rolled or cold-rolled iron and steel products, and other iron and steel products further finished in a manner commonly performed at steel works or rolling mills; also, all sale of fabricated concrete reinforcing bars and relaying rail.

The order makes an OPA license a required condition for selling any iron or steel product covered by these regulations, and permits a court to suspend the license for violation of a price regulation.

Order also contains a provision permitting OPA to require licensees to register at a date to be determined later.

Activity Index Dips During Holiday Week

STEEL's index of activity declined less than usual during the holiday week ended Sept. 12. In that period the index stood at 170.7, off 3.8 points from the preceding week's index figure. During the comparable period of 1941, 1940, 1937 and 1929 the index dropped 6.4, 4.8, 10.5 and 10.6 points respectively.

Steel ingot production held steady at 98 per cent of capacity during Labor day week. On a tonnage basis steel output remains well above a year ago. Iron and steel scrap shipments to mill yards are showing a slight improvement, but are still substantially below necessary quantities to build up producers' stocks.

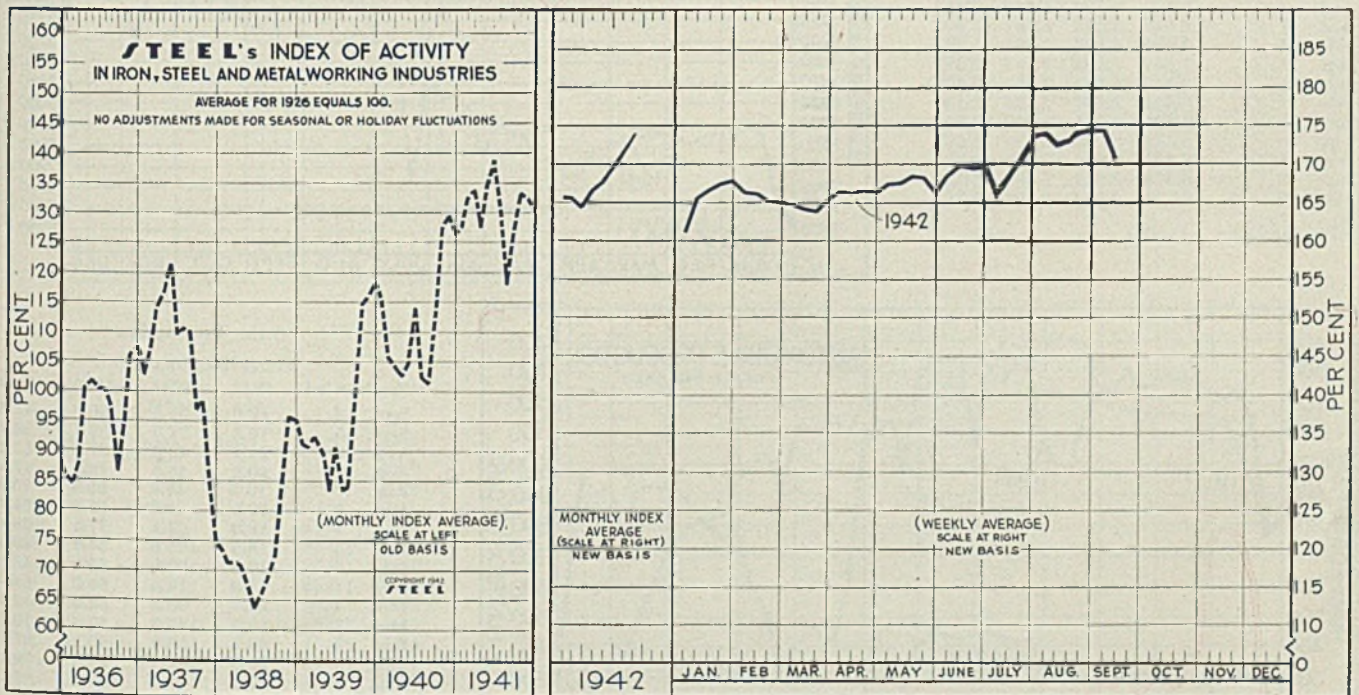
Revenue freight carloadings dropped to an estimated

total of 805,000 in the period ended Sept. 12. This compares with 887,960 in the preceding week and 797,740 in the holiday week last year.

Electric power consumption amounted to 3,570,919,000 kilowatts during the latest period. This represents a sharp drop from the preceding week's figure of 3,672,921,000 kilowatts, due primarily to the holiday interruption. Over the next few weeks electric power production is expected to climb to a new all-time peak.

Dollar valuation of building construction in the 37 eastern states recorded the second consecutive monthly decline during August, according to F. W. Dodge Corp. In the latest period construction was placed at \$721,028,000, compared with \$943,796,000 in July and \$577,392,000 in the corresponding month last year. The all time monthly peak of \$1,190,264,000 was recorded in June of this year.

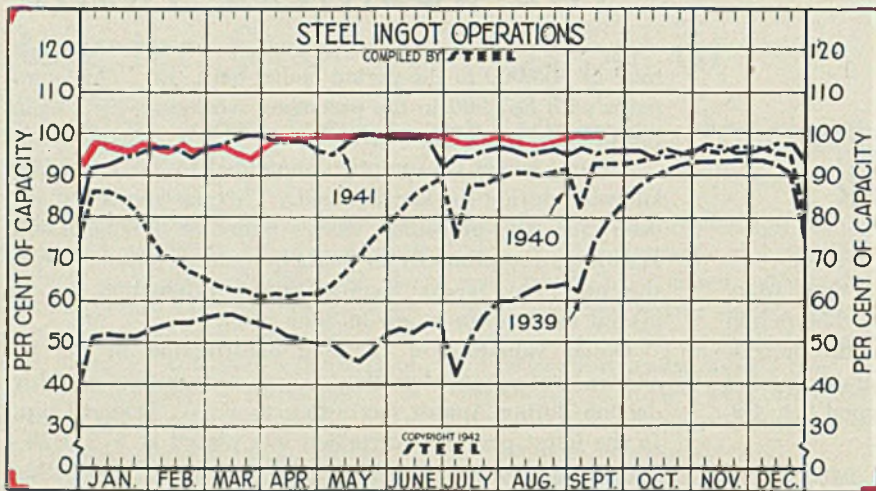
Raw material shortages and dwindling labor supply remain the chief factors hampering further expansion in industrial activity.



STEEL's index of activity declined 3.8 point to 170.7 in the week ending Sept. 12

Week Ended	1942	1941	Mo. Data	1942	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931
July 11	168.9	133.4	Jan.	165.7	127.3	114.7	91.1	73.3	102.3	85.9	74.2	58.8	48.6	54.6	69.1
July 18	172.1	133.2	Feb.	165.6	132.3	105.8	90.8	71.1	106.3	84.3	82.0	73.9	48.2	55.3	75.5
July 25	173.6	132.9	March	164.6	133.9	104.1	92.6	71.2	114.4	87.7	83.1	78.9	44.5	54.2	80.4
Aug. 1	173.8	123.3	April	166.7	127.2	102.7	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0
Aug. 8	172.8	117.5	May	167.7	134.8	104.6	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6
Aug. 15	173.3	118.2	June	169.4	138.7	114.1	90.9	63.4	109.9	100.3	77.4	80.8	70.3	51.4	72.1
Aug. 22	174.0	118.5	July	171.0	128.7	102.4	83.5	68.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3
Aug. 29	174.5	118.2	Aug.	173.5	118.1	101.1	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4
Sept. 5	174.5	111.8	Sept.		126.4	113.5	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3
Sept. 12	170.7†	131.3	Oct.		133.1	127.8	114.9	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2
			Nov.		132.2	129.5	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4
			Dec.		130.2	126.3	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3

†Preliminary. Note: Weekly and monthly indexes for 1942 have been adjusted to offset the forced curtailment in automobile production and to more accurately reflect expanding steel production.



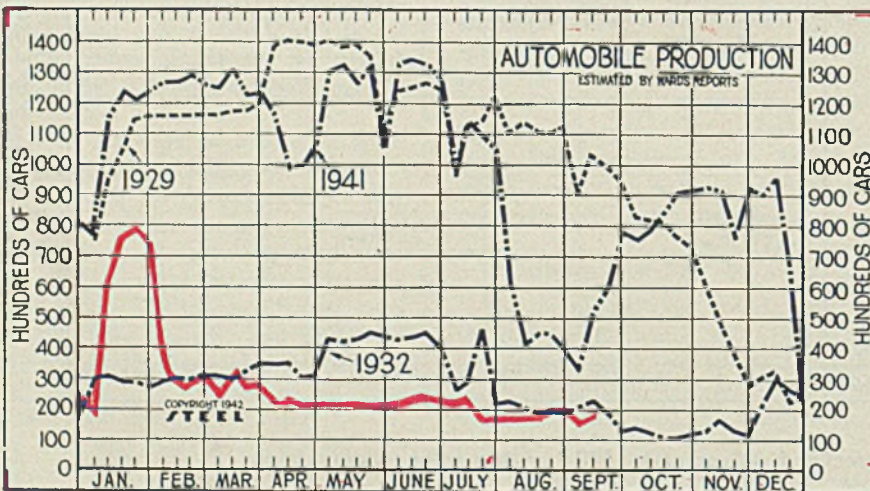
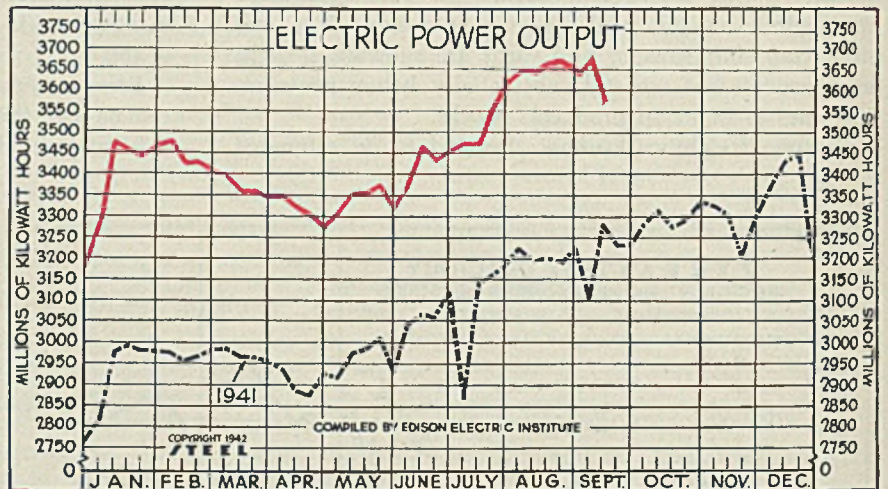
Steel Ingot Operations
(Per Cent)

Week ended	1942	1941	1940	1939
Sept. 12	98.0	96.5	93.0	74.0
Sept. 5	98.0	95.5	82.0	62.0
Aug. 29	98.0	96.5	91.5	64.0
Aug. 22	97.5	96.0	90.5	63.5
Aug. 15	97.0	95.5	90.0	63.5
Aug. 8	97.5	96.5	90.5	62.0
Aug. 1	98.0	97.5	90.5	60.0
July 25	98.5	96.0	89.5	60.0
July 18	98.0	95.0	88.0	56.5
July 11	97.5	95.0	88.0	50.5
July 4	97.5	92.0	75.0	42.0
June 27	98.5	99.5	89.0	54.0
June 20	99.0	99.0	88.0	54.5
June 13	99.0	99.0	86.0	52.5
June 6	99.0	99.0	81.5	53.5
May 30	99.0	99.0	78.5	52.0
May 23	99.0	100.0	75.0	48.0

Electric Power Output
(Million KW/H)

Week ended	1942	1941	1940	1939
Sept. 12	3,571	3,281	2,773	2,532
Sept. 5	3,673	3,096	2,592	2,376
Aug. 29	3,640	3,224	2,736	2,442
Aug. 22	3,674	3,193	2,714	2,434
Aug. 15	3,655	3,201	2,740	2,454
Aug. 8	3,649	3,196	2,743	2,414
Aug. 1	3,649	3,226	2,762	2,400
July 25	3,626	3,184	2,761	2,427
July 18	3,565	3,163	2,681	2,378
July 11	3,429	3,141	2,652	2,403
July 4	3,424	2,867	2,425	2,145
June 27	3,457	3,121	2,660	2,396
June 20	3,434	3,056	2,654	2,362
June 13	3,464	3,066	2,665	2,341
June 6	3,372	3,042	2,599	2,329
May 30	3,323	2,924	2,478	2,186

†Preliminary.



Auto Production
(1000 Units)

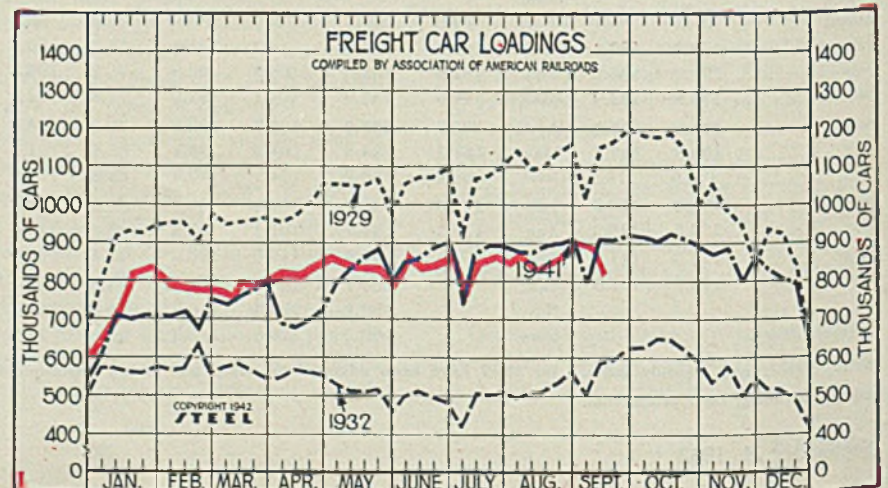
Week ended	1942	1941	1940	1939
Sept. 12	19.6	53.2	66.6	41.2
Sept. 5	16.9	32.9	39.7	26.9
Aug. 29	21.1	40.0	27.6	25.2
Aug. 22	20.2	45.5	23.7	17.5
Aug. 15	19.2	45.6	20.5	13.0
Aug. 8	19.2	41.8	12.6	24.0
Aug. 1	18.3	62.1	17.4	28.3
July 25	18.3	105.6	34.8	40.6
July 18	17.9	109.9	53.0	47.7
July 11	23.0	114.3	65.2	61.6
July 4	22.7	96.5	52.0	42.8
June 27	22.9	127.9	87.6	70.7
June 20	23.2	133.6	90.1	81.1
June 13	22.3	134.7	93.6	78.3
June 6	22.0	133.6	95.6	65.3

Figures since Feb. 21 last include Canadian trucks and automobiles and United States trucks.

Freight Car Loadings
(1000 Cars)

Week ended	1942	1941	1940	1939
Sept. 12	805†	914	804	806
Sept. 5	888	798	695	667
Aug. 29	899	913	769	722
Aug. 22	869	900	761	689
Aug. 15	869	890	743	674
Aug. 8	850	879	727	665
Aug. 1	864	883	718	661
July 25	856	897	718	660
July 18	857	899	730	656
July 11	855	876	740	674
July 4	759	741	637	559
June 27	853	909	752	660
June 20	840	886	728	643
June 13	833	863	712	638

†Preliminary.

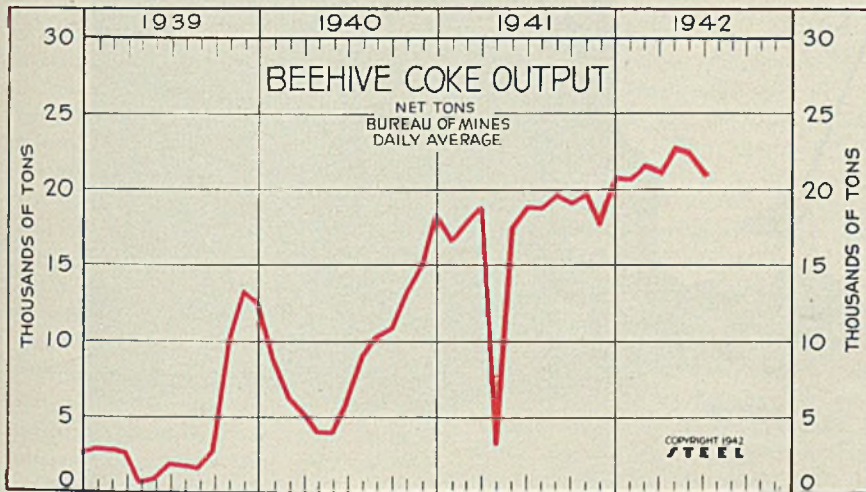
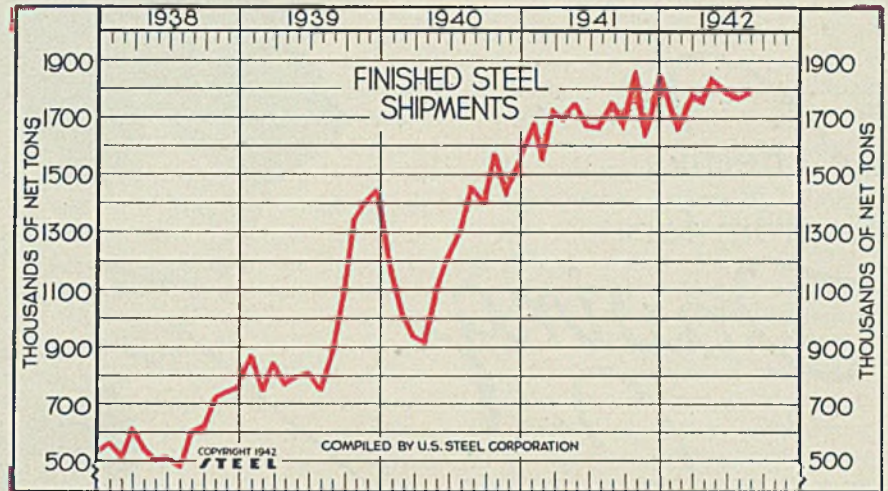


Finished Steel Shipments U. S. Steel Corp.

(Unit 1000 Net Tons)

	1942	1941	1940	1939	1938
Jan.	1738.9	1682.5	1145.6	870.9	570.3
Feb.	1616.6	1548.5	1009.3	747.4	522.4
Mar.	1780.9	1720.4	931.9	845.1	627.0
Apr.	1758.9	1687.7	907.9	771.8	550.5
May	1834.1	1745.3	1084.1	795.7	509.8
June	1774.1	1668.6	1209.7	807.6	525.0
July	1765.7	1666.7	1296.9	745.4	484.6
Aug.	1788.7	1753.7	1455.6	885.6	615.5
Sept.	1664.2	1392.8	1086.7	635.6	
Oct.	1851.3	1572.4	1345.9	730.3	
Nov.	1624.2	1425.4	1406.2	749.3	
Dec.	1846.0	1544.6	1444.0	765.9	
Tot.†	15,013.7	11,707.3	7,315.5		

†After year-end adjustments.



Beehive Coke Output

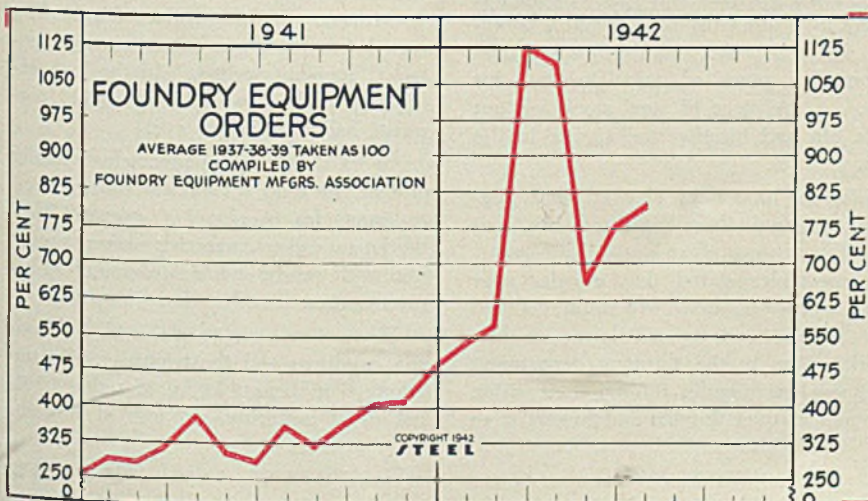
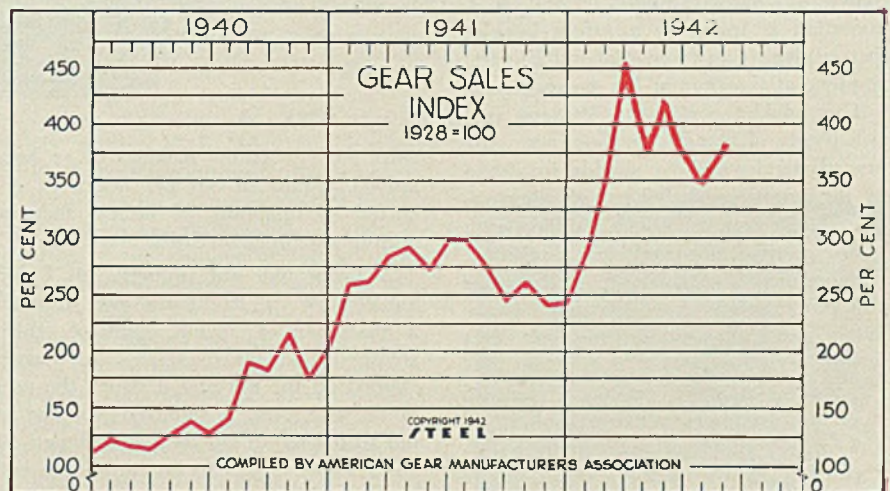
(Daily Average)

	1942	1941	1940	1939
Jan.	20,874	16,581	8,826	2,973
Feb.	21,771	17,729	6,212	2,954
March	21,032	18,890	5,196	2,544
April	21,843	3,100	3,928	796
May	22,571	17,458	3,930	919
June	22,487	18,803	6,036	1,992
July	21,332	18,655	8,877	1,852
Aug.	19,697	10,293	1,633	
Sept.	19,133	10,872	2,892	
Oct.	19,768	13,441	9,831	
Nov.	17,727	15,138	13,315	
Dec.	20,968	18,516	12,544	
Total	17,402	9,256	4,498	

Gear Sales Index

(1928 = 100)

	1942	1941	1940	1939	1938
Jan.	288	259	123	91.0	93.0
Feb.	353	262	116	86.0	77.0
Mar.	455	288	114	104.0	91.0
April	378	292	128	88.0	74.0
May	421	273	133	93.0	70.0
June	373	299	129	90.0	58.0
July	344	298	141	89.0	67.0
Aug.	380	276	191	96.0	76.5
Sept.	243	183	126.0	80.5	
Oct.	261	216	141.0	72.5	
Nov.	241	173	126.0	72.0	
Dec.	243	208	111.0	81.0	
Ave.	269.6	155.0	103.0	76.0	



Foundry Equipment Orders

Monthly Average
(1937-38-39 equals 100)

	1942	1941	1940
Jan.	532.7	285.3	149.0
Feb.	567.9	281.1	135.7
March	1122.4	315.2	183.2
April	1089.3	377.2	145.2
May	653.6	298.7	129.1
June	774.0	281.1	164.9
July	800.8	358.1	194.4
Aug.	312.9	165.4	
Sept.	363.8	161.2	
Oct.	403.8	264.0	
Nov.	408.5	254.2	
Dec.	481.2	257.8	
Year	345.6	184.0	

September 21, 1942

An Effective Program for

Saving Eyes

... creates much good will, reduces accidents, increases production

"AN INJURED eye has no trade-in value on a glass eye" is a truism that could well take its place alongside those homely but expressive bits of wisdom known as *Aesop's Fables*. And that quotation is found in a safety booklet that is given every new General Electric employe at the time of his engagement.

This booklet continues, "We can furnish plenty of goggles, but no eyes. Approved goggles and eye shields, furnished by the company, shall be used when required. Examples: When working with or near splashing materials, grinding, chipping, cutting, cleaning, welding, or any other operation which may release flying particles, dust or injurious light or heat rays."

To carry out this policy, a plentiful stock of goggles was maintained in all tool cribs. Any workman could obtain a pair at any time upon request at the tool crib in his department. We thought we were doing a good job of eye protection. Yet our works hospital recorded too many eye injuries.

So we analyzed our records for the past five years, investigated these accidents and gave the subject of eye protection concentrated attention. We learned much.

First, we found that workmen supplied with goggles were not wearing them over their eyes when injured; they did not think there was any hazard in the work they were doing at that time; they were not pleasant to wear, so why wear them? Second, most eye injuries were at

work not generally recognized as hazardous. Many of our eye accidents occurred to operators of lathes, shapers, milling machines or drills.

A flying nail not properly hit found a man's eye. . . . Another worker dropped a quart can of solvent, some of which splashed into his eyes. . . . A wrench slipped off the nut and it struck the user in the eye. . . . A toolmaker in one of our model rooms cut off a short length of silver solder wire. As he did so, one end penetrated his right eye. . . . A man was doing light assembly work when a porcelain fell and broke. At the hospital they removed a piece of porcelain from his eye. . . . A piece of steel stock fell out of a bin and hit the stockkeeper in the eye.

Machine operators claimed that goggles bothered them, steamed up, limited their range of vision. Those wearing spectacles stated that goggles over their spectacles caused eye strain, claimed they were a handicap and slowed up their work. Men in the shipping department claimed that goggles limited their vision—some mashed thumbs and fingers were

These safety glasses saved this machinist from a bad eye accident when one lens was hit by a piece from a broken drill

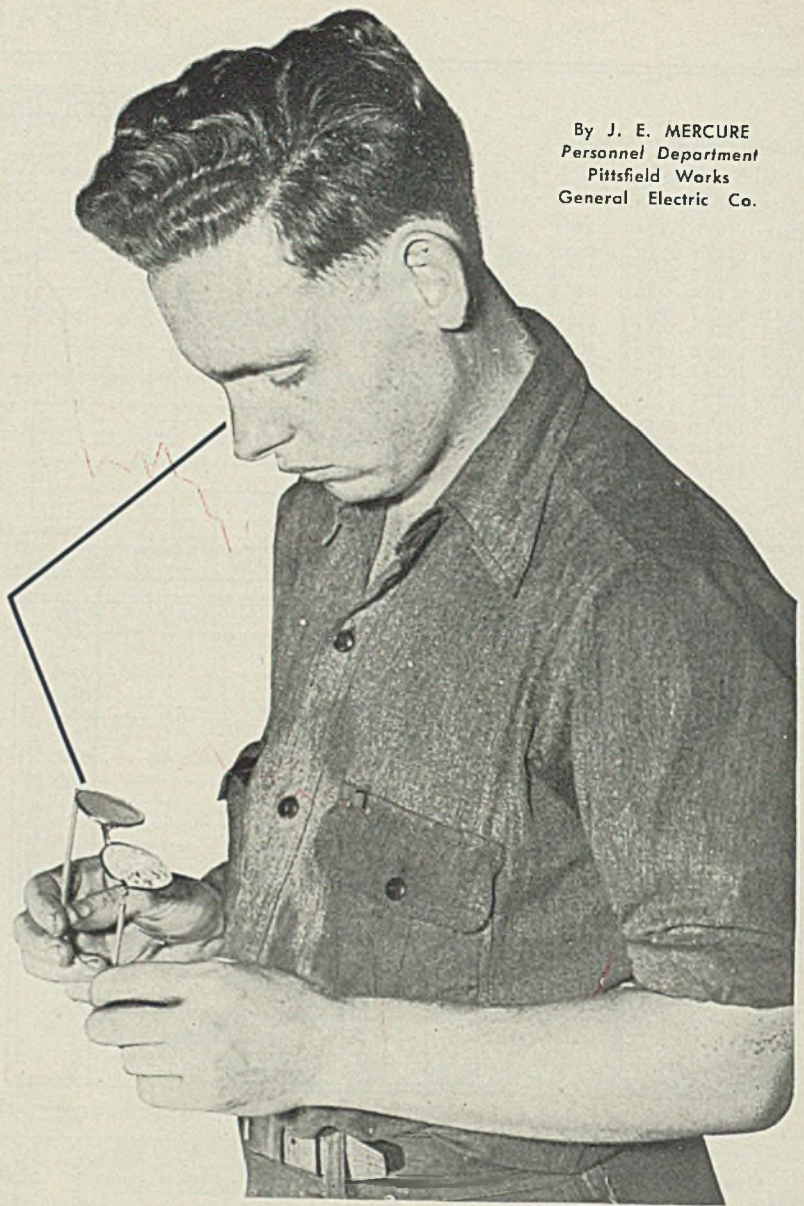
shown to prove it. Stockkeepers would not be convinced they should wear goggles.

It was apparent soon after the start of this investigation that most eye injuries happened to men not wearing spectacles. I arranged with our hospital staff to record whether spectacles were worn on every accident report involving an eye injury. Nine months of recording revealed but one eye injury among spectacle accident victims. In the lone exception, a lens was broken and fragments had injured the eye.

An idea! Ordinary spectacles actually protect the eyes. *Why not supply safety spectacles in place of goggles?* If a workman wears corrective lenses, supply him with safety spectacles ground to his prescription.

There were benefits in this idea to both the employes and the company. To the employe it meant saving of sight, elimination of suffering, no loss of income.

By J. E. MERCURE
Personnel Department
Pittsfield Works
General Electric Co.



To the company it meant a reduction in accident costs, no lost time, more production, and one more chance to better the good relations between the company and its employees.

At this point we encountered a real problem. Every pair of safety spectacles must be fitted to the individual by someone trained in the art. Goggles had been issued from tool cribs in the past, but training tool crib attendants to fit spectacles was obviously out of the question.

Besides, there were many features about the issuing of safety goggles from tool cribs that were not desirable. The inventory of goggles was too high. Handing safety goggles to a workman across the tool crib counter was haphazard. Sometimes they were suitable to his work, sometimes not; sometimes they fitted, but not always; sometimes they were new; sometimes they had been worn and returned, not too clean, and were given out again in the same condition. Such a setup did not encourage the wearing of goggles.

Why not train our hospital staff in the art of fitting spectacles and goggles and then have all goggles and spectacles issued to the individual from the hospital?

With the approval of our plant doctor, we arranged for this training. We obtained the services of an expert from a company manufacturing goggles and spectacles. He not only taught our staff to fit them but also how to measure for pupillary distance, distance between lenses, temple length, and how to determine the size of lens and type of frame. These measurements are equally essential when corrective lenses are prescribed.

A chart showing what type of goggles or spectacles should be worn for each class of work in the plant was prepared for use by our hospital staff. We then withdrew all safety goggles from every tool crib in the plant. At the same time a notice was issued that from that date all forms of eye protection would be issued from the works' hospital and then only to the individual for whom intended. In every case the worker would be carefully fitted and special attention would be given to supplying the correct type of goggles or spectacles.

Now, an employe who wears prescription spectacles brings in a copy of his prescription, obtains an order from his supervisor, and presents these to the hospital. A nurse measures the pupillary distance, distance between lenses, temple length, determines the size of lens and type of frame and enters this information on the prescription. Spectacles made up to this prescription are then ordered and personally fitted to the workman at the hospital. He is urged to return the

glasses for readjustment if they feel uncomfortable at any time.

Establishing a central point in the plant where goggles or spectacles could be repaired at any time upon presentation solved the problem of keeping every pair in good condition.

Whenever an employe is finished with a pair of goggles or spectacles not made to a special prescription, they are sent to this central point for inspection. If possible, they are reconditioned, cleaned, sterilized, and placed in stock to be reissued; otherwise they are scrapped.

After carefully preparing this setup we were ready to start an intensive campaign to promote 100 per cent use of safety spectacles where needed.

"Doubting Thomases" Satisfied

Supervisors were first convinced that there was need of more eye protection in the plant and that the safety spectacle was the answer. The "doubting Thomases" were satisfied by a demonstration of driving eight-penny nails through a 2-inch thick block of wood using a pair of spectacles as a hammer.

Safety talks on eye protection were given to group of workmen, telling them of the value of safety spectacles. The nail-driving demonstration was repeated with one of the workers performing the stunt. By this means we gradually educated our employes to the value of safety spectacles in their work. We have not attempted to force the workers to wear them. Instead, we worked along lines that would create interest and demand.

Today, approximately 3000 pairs of safety spectacles are worn in the plant, 2040 of these having prescription lenses.

What has the company gained by this campaign of eye protection? A great reduction in the number of eye accidents with a natural decrease in accident cost; the goodwill of the employes, who really appreciate such a service. And this is only a part of the gain. We have actually improved the vision of many workers through the use of safety spectacles with resultant improvement in production.

Shortly after our campaign on safety spectacles began, I investigated the cause of a finger injury of a lathe operator. The foreman told me he would have to remove the injured workman because his work was not up to standard and he was slowing up. This lathe operator was about 50 years old. He wore no spectacles, and I suspected he should have been wearing safety spectacles.

The workman admitted he needed spectacles, but he did not feel financially

able to purchase them. He had his eyes examined and brought in a prescription. We purchased a pair of safety spectacles for him at a cost to the company of \$6.68. Ten days after this workman received his safety spectacles *he had almost doubled his daily production and, what was equally important, not one piece of his work had been rejected.*

The prescriptions filed by our hospital staff have provided much information that has been helpful in furthering the program. An analysis of the first 700 prescriptions, for example, showed that few persons had eyes with equal vision. This emphasized to us the importance of thorough eye examinations. If a workman presents a prescription based on a perfunctory examination or one three or four years old, we encourage him to have another examination by an accredited eye man.

Recently a machinist presented a prescription which had been made out for the dress glasses he was then wearing. He could not read the small graduations on his steel scale without using a magnifying glass. A thorough eye examination revealed that his vision in one eye was better than in the other, but his glasses didn't compensate for the difference. The safety glasses obtained for him were correctly prescribed, and just the other day the man told me he still had pep at quitting time, whereas formerly he had been tired at mid-afternoon.

Another thing we have learned is that you must fit the spectacles correctly and not have them any larger generally than

(Please turn to Page 105)



Nurse in works hospital measuring for pupillary distance as part of the procedure in fitting safety spectacles

Effect of Aerial Warfare on

STEEL-FRAMED BUILDINGS

BOMBS FROM the air are quite real. They can do considerable damage. The fall of France focussed attention on the Germans' subsequent attempt to "soften up" England preparatory to an invasion. That they did not "soften up" the English testifies to the sturdy character of the people rather than to the quality of their buildings. During the winter of 1940-41 an aerial bombardment was let loose on London, Coventry, and other cities of England, the like of which the world had never experienced.

The photographs of those bombings that were sent us obviously were focussed on the human interest story rather than any scientific facts that might be disclosed. In the early spring of 1941 I approached Sir Gerald Campbell and our own state department to see if I could not get from England some photographs of the damage that would provide us with some means of making a clinical study of the resistance of certain types of structures to aerial bombardment.

As a result of our inquiries, the British finally sent 47 photographs which indicate that buildings fully framed in steel

By V. G. IDEN
Secretary
American Institute
of Steel Construction
New York

resist the indiscriminate and wholly unpredictable stresses resulting from bomb blasts—even under direct hits—to an amazing degree.

They prove that the American type of skyscraper is a very safe structure. London wishes they had built more of them. We may be thankful that we in the United States have built so many of them. The captions for the illustrations tell the story of each.

Most of the pictures of such bombing damage to appear so far in the American press have been taken to provide a human interest. They have shown the terrific damage done to the flimsier types of structures and *therefore have not provided any clinical study of how various building materials stand up.* It should be borne in mind that the damage shown in these pictures is the result of *direct hits* and therefore much worse than would have been the case had the explosions occurred further away.

The British Steelwork Association, collaborating with the British governmental authorities have been making an inten-

From a paper presented before the twenty-seventh annual meeting of the Building Officials Conference of America Inc., Pittsburgh, May 21, 1942.

Fig. 3—Here again, bomb damage has been confined to only a portion of three or four stories. The remainder of the building is intact. In many instances, damage is done to only one or two stories. This shows damage at Grove End Gardens, N. W. 8

Fig. 4—Here the walls and concrete floor slabs were blown away by the explosion. Steel frame is intact, ready for new floors and a new wall, both of which can be supplied quickly without too much expense



sive research in connection with this very modern structural problem. Their observations to date have prompted the following statement: (I quote from a report accompanying the photographs.)

"The fully steel-framed building has suffered only to a very minor extent and has shown remarkable resilience, which has tended to localize the damage. This local damage in many cases has been subject to rapid repair. The bulk of the damage caused has been in old buildings of ordinary brick construction, and included in this type are those in which cast iron, wrought iron or steel units have been used as individual members, usually resting on pad-stones. Naturally with the collapse of the walls following the blast, these unframed members have also collapsed."





Those conclusions have been fully corroborated by reports of competent and unbiased observers from America who have had the opportunity to study the problem first-hand.

The incessant bombing raids on London and other cities of Europe have proved that steel bridges and steel-framed buildings provide the greatest degree of safety against the ravages of modern warfare.

Engineers who have studied the bombing damages in London are the authority for this statement.

The United States Army has made tests of various kinds of construction from which it appears that structures fully framed with structural steel are the best.

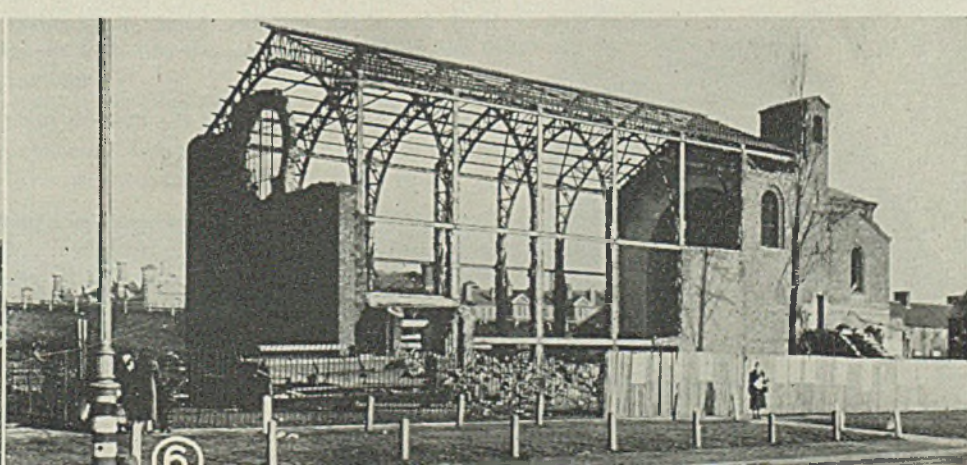
The Office of Civilian Defense has proceeded upon the assumption that it

Fig. 1—These views show that steel-framed buildings have the ability to withstand severe punishment from bombing without damage to the structure as a whole. Crater indicates detonation occurred when bomb struck foundation walls in this apartment house at Westminster Gardens, S. W. 1.

Fig. 2—Closeup view of same structure as in Fig. 1. Note that bomb effect is localized in the first story. Stability of building as a whole is unimpaired even with the loss of two columns sheared off by the blast at basement level.

Fig. 5—In most instances, bombing has had but a localized effect upon steel-framed structures. Here a bomb exploded against elevator penthouse without appreciable damage to roof and lower floors. Steel frame still stands at place of direct hit. Bent frame members are straightened or new member inserted and other repairs made with little difficulty or expense. This is Terminal House, S. W. 1

Fig. 6—The relatively large unsupported wall panels in this church in Westway were no match for the bomb. Excellent condition of the steel framing is remarkable in contrast. A new overcoat will put this structure back in service again



is not feasible to construct bomb shelters to withstand direct hits.

Today we are at war. Ours is no longer an effort to aid our friends, but an effort to defeat our enemies. Everything must be put to that one use—to prosecute the war to a successful conclusion. The War Production Board tells us that it is going to require every pound of steel we can produce to make the equipment essential to our fighting forces. There is going to be precious little material left with which to build air-raid shelters. Unless buried deep in the ground, no shelter can insure complete immunity to the bomb hazard. It would not be possible to build such places of refuge for more than a tiny fraction of the people who will be exposed to the hazard if enemy planes appear over us. We must all accept with fortitude the fact that there are no longer lines behind which the civilian population is completely secure.

Skyscrapers Safe

The first bulletin of the government on defense structures flatly states that aerial bombing causes but slight damage to steel bridges; that steel-framed buildings stand up best under attack. All of the steel bridges of London are still functioning. A report made to the American Institute of Architects likewise claimed that skyscrapers are likely to be safer in case of bombing attacks than the lower buildings alongside. The architect who made that report, William Orr Ludlow, said that the nature of high buildings should dispel "unnecessary fears and misapprehensions". Skyscraper floors are the most difficult type of construction to penetrate and destroy, he added.

In the British Institution of Structural Engineers' A.R.P. report, published in October, 1938, great stress was laid on the undoubted superiority of steel-framed buildings against aerial attack. In a report published by that same institution in April, 1941, it was stated that "experi-

ence has more than justified those recommendations. This is perhaps the most remarkable conclusion from our experience." Realizing what British cities have experienced from aerial bombing between October, 1938, and April, 1941, that is indeed a strong endorsement of steel-framed buildings.

The British committee calls attention to the value of soundly jointed structures as evidenced by the experience in England. This is particularly recommended in the case of main beams in single-story factory construction where insurance against "spreading collapse" is desired. They have found, however, that steel members heated as the result of bombing and of subsequent fires may normally be used again after straightening. This particular quality in steel has undoubtedly enabled English industry to continue effective production despite the alleged devastating bombing raids by the Germans.

A pamphlet, *Civilian Defense, Protective Construction*, was prepared by the War Department and issued this spring by the Division of State and Local Cooperation Offices for Emergency Management. It was prepared only after careful study and actual observation of the damage sustained from bombings in England.

The pamphlet stated: "When all the effects of bombs are considered, steel-framed structures are much more resistant to collapse than any other type. It is difficult to destroy by a bomb even a single important member of a frame, except by direct impact or when explosion is in contact with the member. A near miss simply scars the steel with fragments and perhaps displaces it by a few inches. The most serious effect results when a bomb bursts in the floor and displaces the base of a column. Here the damage may be widespread. However, if such a member were severed

(Please turn to Page 104)

Fig. 7—Structural damage to Thames House shown here was confined to a limited portion of top two stories only. Damage to first five stories consisted principally of broken windows. A damaged area no longer than this one would be lost in the vastly larger areas of a modern skyscraper

Fig. 8—Even in older type of steel-frame buildings such as this one at Torrington, W. 1, loss of the first-story length of the corner column had little effect on remainder of the structure. Examples like this show the adequacy of even the older fully-framed buildings

Fig. 9—Bomb that damaged the General Building, Aldwych, appears to have struck against the side wall. In such a case, damage usually is confined to one, two or, at the most, three stories. Similar damage in a tall skyscraper would be minor

Fig. 10—This view of the apartment house at Cranmer Court, S. W. 1, discloses the severity of the bomb explosion which smashed all windows and blasted away some of the curtain walls. Explosion had little effect on steel frames, however. Havoc was work of more than one bomb, one exploding within the second story at the corner of the building and at least one other outside the building in the vicinity of the bay windows.

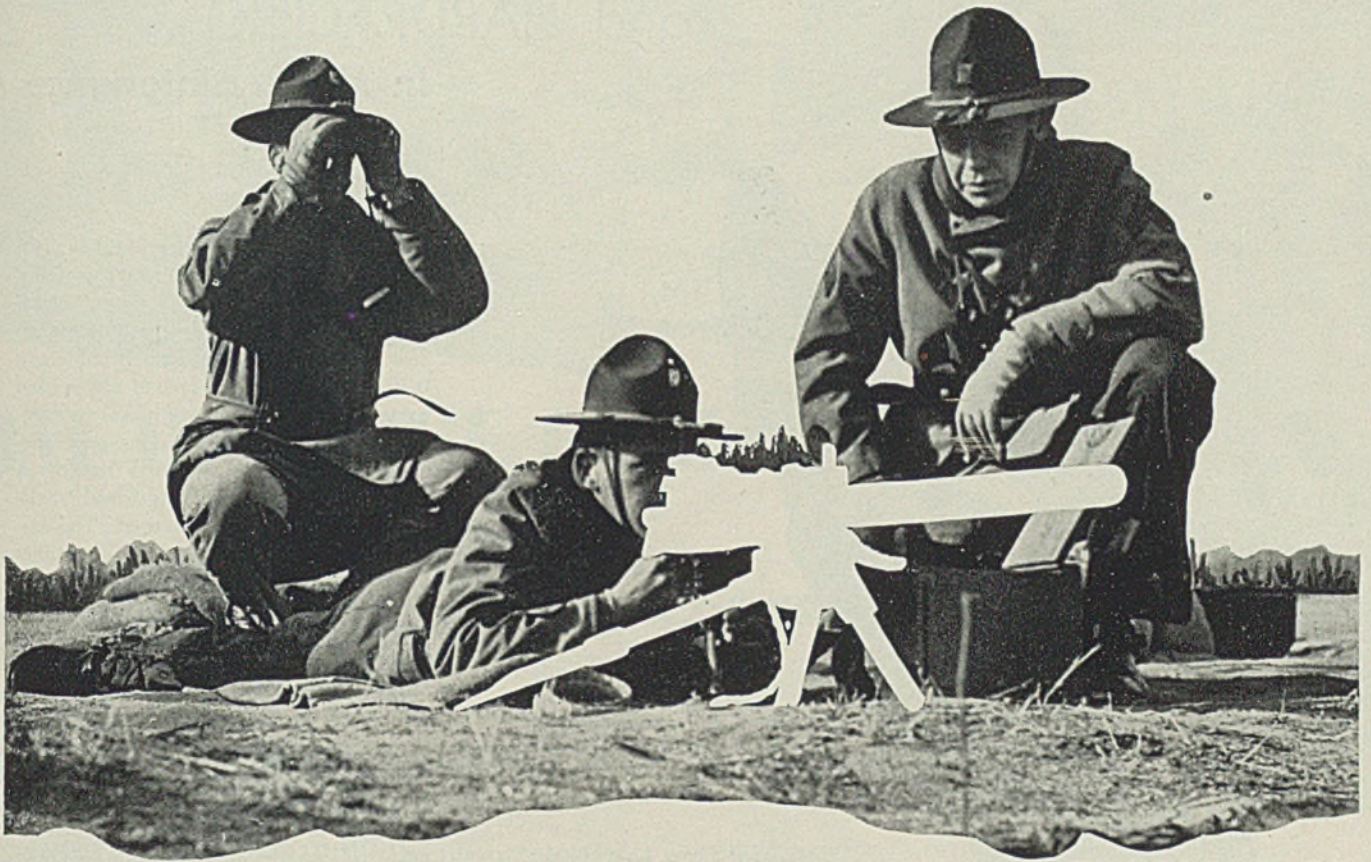


Photo by U. S. Army Signal Corps

Do you want YOUR boy to be short of equipment?



When he is called upon to go into action against the enemy, do you want him handicapped by lack of proper fighting equipment... all because the rest of us back home failed to supply *enough scrap* to keep the steel mills running full speed?

There is no fooling about this scrap shortage. It's really serious! And it must be corrected speedily by a whole-hearted, determined job on the part of every man in industry. We *must* find that much-needed scrap and *turn it in!*

It's not only our *job*... it's our moral *responsibility*...

to turn in every pound of metal that is not actually at work in our plants! The men on the battle front *need* the worn-out machines, old gears, obsolete tools—all the junk metal in *your* plant. They need it **NOW!**

Place a responsible executive in charge of your salvage program. Put properly marked boxes throughout the plant.

Even old screws, nuts and bolts can soon be converted into bullets and guns to back up the boys who are doing the shooting at the front.

Dig out *your* scrap! Get *in* the scrap to lick the Axis!

THE *Carpenter* STEEL COMPANY, READING, PA.

BUILDING-UP and HARDFACING

In Mill Maintenance

By SCOTT D. BAUMER
Steel Mill Representative
Air Reduction Sales Co.
New York

(Concluded From Last Week)

REBUILDING Wabblers: One of the most outstanding restorations and one which may be done repeatedly is the rebuilding of roll, pinion and spindle wabblers and coupling boxes. Whether of cast iron or steel, reclamation offers no serious problems, but a procedure should be worked out according to the metal composition. It is advisable first to pre-heat the part both to eliminate oil and grease and to show up any surface cracks or spalled metal caused by continued mill hammering. The preheat temperature varies, of course, with the composition of the part, and the welding process likewise may be so determined, though the amount of build-up required also influences the choice of process.

The piece is mounted on rollers for easy positioning during welding, surrounded by a brick furnace, and pre-

heated to about 1000 degrees Fahr. for cast iron, and about 400 degrees Fahr. for alloy steel rolls. Molybdenum-nickel cast iron rod is suitable for building up cast iron wabblers. On steel wabblers, a 0.40 to 0.50 per cent carbon rod is used in building-up, with a nickel manganese steel rod for final passes, each successive layer being peened lightly. A hardsurfacing rod such as Stoody Self-Hardening may also be used. The operator should frequently use a templet to determine the shape and amount of metal required to build to the proper dimensions, thus avoiding unnecessary grinding.

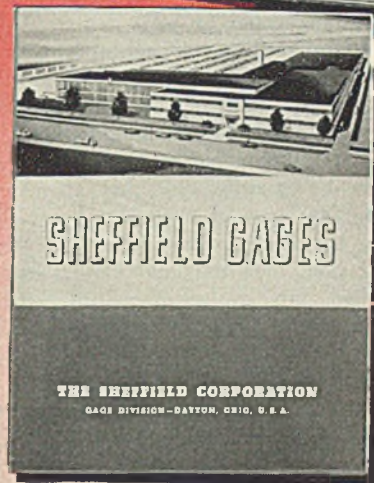
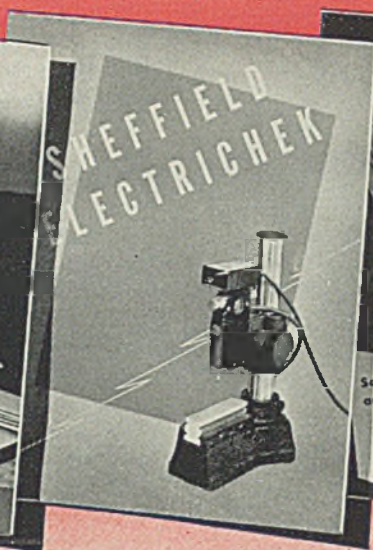
Press Dies: Another maintenance problem which can be solved by hardfacing is the reclamation of worn press and hammer dies. These dies, whether made of alloy steel or of a less costly substitute as is often the case since the alloys have become scarce, may be restored to their original condition, or better, by building up with mild steel rod and finishing off with a carbon molybdenum rod or an impact-resistant hardfacing material, as the occasion may demand. The contours of many such dies have been redesigned to accommodate hardfacing. In any case discarded dies may be salvaged by machining a shoulder where necessary to give support to the hardfacing application. The overlay should be peened while hot to relieve stresses and to produce a hard, dense deposit.

Mill Guides: The solution to the problem of maintaining mill guides is also met by build-up reclamation, though details of procedure differ from one mill to another. Certain mills use guides cut from steel plate and hardsurfaced, finding these to work satisfactorily without

Fig. 7. (Top)—This worn shaft was first turned down $\frac{1}{4}$ -inch below finished diameter, then built up with Airco No. 91 electrode, a material selected for its hardness and resistance to abrasion. Shaft was then ground down and flame hardened

Fig. 8. (Middle)—Another type of mill guide, hardsurfaced on the wearing edge. Service life of this cast iron guide is increased eight times by this application of Stoodite

Fig. 9. (Bottom)—Completely restored to original size and shape, this wabblers is again ready for service. The job required the application of 70 pounds of molybdenum-nickel cast-iron rod which was applied in 22 hours, while maintaining pre-heat temperature to prevent warping and cracking



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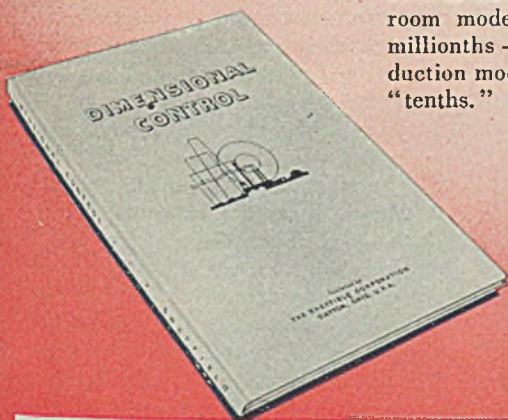
operate—extremely rugged in construction.

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scratching the steel in process of rolling. Others have standardized on brass or bronze guides, while another mill may be compelled to use cast iron or cast steel guides to avoid metal build-up and scoring of the rolled steel. It is generally, though not always, true that the harder the guide material, the more tendency there is to such scratching.

Where rolled steel guides are used, hardfacing has been applied with considerable success. The guides are grooved $\frac{1}{8}$ -inch deep and 2 inches wide on both sides, preheated to 1100 degrees Fahr. and hardfaced by the oxyacetylene process. The overlay is built up slightly above the depth of the groove, to insure a smooth after finish grinding.

The cast iron guides used at one mill were customarily discarded after rolling 3000 tons of steel. By hardfacing this has been increased to 7500 tons, and even then the guides are not discarded, but are resurfaced repeatedly. Both the oxyacetylene and the metallic arc processes are suitable for this application.

Brass or bronze mill guides are reclaimed when worn by burning out any adhering steel with a torch, preheating to remove dirt and grease, and filling up the grooves with phos-copper rod using the carbon arc process. These guides are used on both sides and may be restored four times, on the average, before being discarded.

Hardfacing of Shafts: The restoration of worn shafts is a good example of the importance of proper selection of build-up material. According to the purpose of the shaft, it may be subject to abrasion, friction or corrosion or a combination of these factors. Since considerable time and effort may be spent in dismantling the machine to remove the worn shaft, careful consideration should

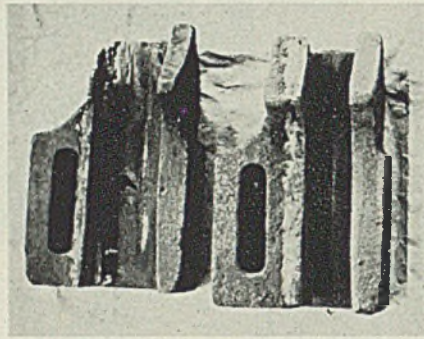


Fig. 10—Reclaimed mill guide is shown at right after it was built up with Stoody Self-Hardening and faced with Stoodite. This treatment increased its life 10 times over that of the original. A worn guide is shown at left to indicate the severe wear that these guides experience

be given to these service conditions in choosing the proper build-up material which will give the longest service life. The building-up process presents no difficulties, but precautions must be taken in hardfacing to minimize the tendency toward checking.

In hardfacing a shaft the entire area to be treated should be held at a fairly constant heat while the overlay is being applied. For some operations a torch is preferable since it aids in holding the heat, although the metallic arc is equally suitable provided frequent current adjustments are made to avoid excessive penetration. Each bead is run lengthwise for the full distance. When the surfacing is completed the shaft is cooled slowly in hot sand or ashes, and is rough-ground at about 500 degrees Fahr. Finish grinding should be done with a coolant so that the shaft temperature never exceeds 150 degrees Fahr. Other

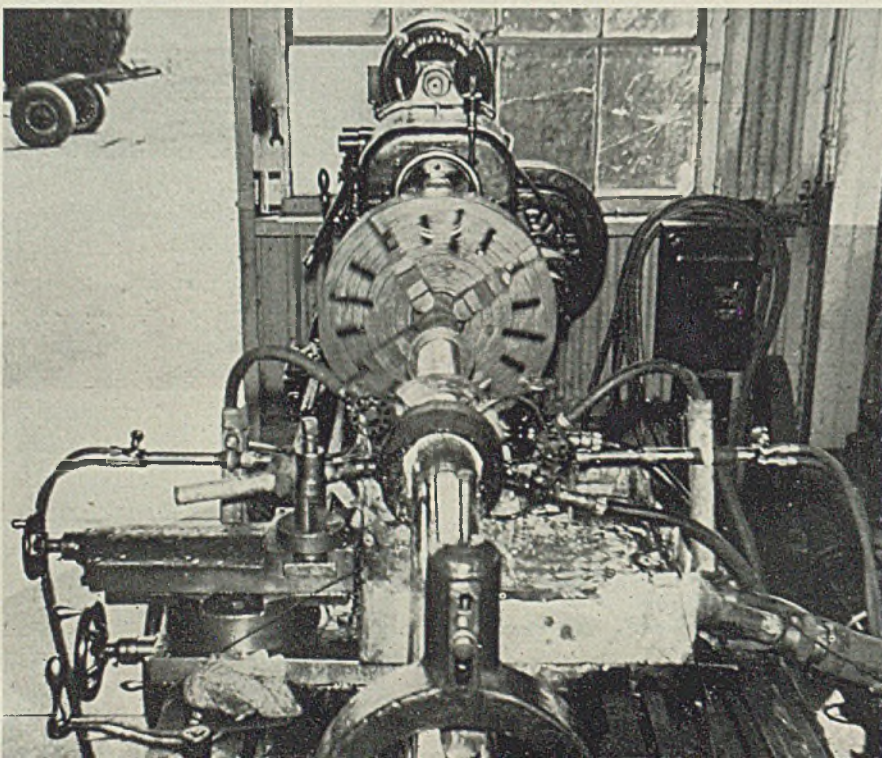
shafts may be welded without preheat depending on their composition and size.

High-Temperature Applications: One of the benefits of hardfacing which is most valued today is that by prolonging the life of wearing parts it reduces the frequency of shutdowns for repairs. This is nowhere more evident than in such equipment as billet heating furnaces, which are being forced to the limit to produce maximum tonnages. The severe abrasion which the furnace skid pipes receive while at high surface temperature ordinarily means frequent shutdown of the furnace for replacement and repair. However, an application of Stoodite or similar hardfacing material which retains its physical properties at high temperatures, will increase the life of the skid pipes many times over. Only the top surfaces of the pipes need be hardfaced, and for such applications as this, the capacity of this hardfacing material to smooth out under wearing action further contributes to lengthy service, and avoidance of production delays.

Similar working conditions prevail with coke pusher shoes, ingot stripper bits and other parts subject to both high temperature and abrasion. Hardfacing gives these parts many times the life of the original part, eliminating work stoppages and unnecessary replacement. For resurfacing coke pusher shoes, the face should be machined or ground clean, preheated to a red heat, and a double layer of hardfacing material applied while maintaining this heat. Subsequent grinding is unnecessary if the surface deposit is comparatively smooth, and after brief use the hardfacing becomes quite smooth, causing less abrasion on the brick floor than an ordinary steel shoe.

General Purposes: The number and variety of wearing parts of steel mill equipment which can be effectively reclaimed when worn are far too numerous to be described individually. However, the operations described in this article are representative of most such problems, and the methods used apply with variations to other building-up and hardfacing operations of similar nature. Certainly there can be no question of the desirability of extending the service life of mill equipment as long as possible. Mill maintenance departments are performing an increasingly important function in these times, and their services will be called upon more extensively than ever before.

Fig. 11—The restored shaft is being flame hardened for still greater wear resistance. Two 3-flame torches are used with a quench ring, all mounted on a lathe carriage for hardening the shaft by the progressive spinning method



SMALL DIE CASTINGS ALSO SERVE



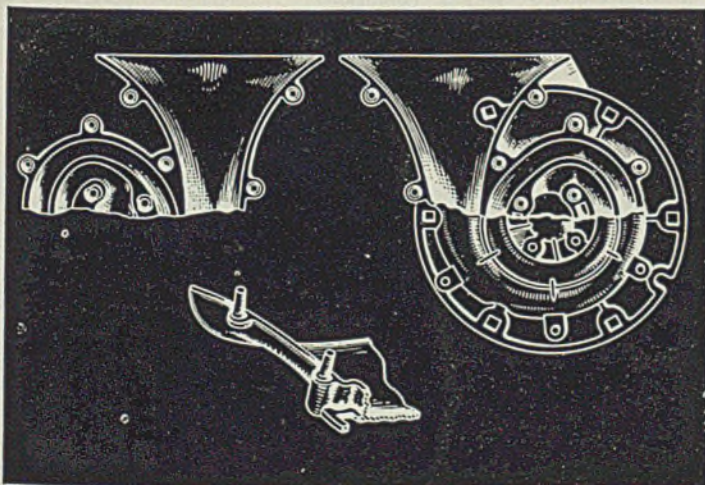
Shank shown in inset approximately $\frac{1}{2}$ actual size—4,100 castings to the pound.

When the manufacturer of the tiny ZINC Alloy Die Castings shown above supplies one pound of his product to the Government, he is providing cup-eye shanks for 4,100 doctors' and nurses' uniform buttons. As shown in the inset, these die cast shanks are used in conjunction with toggle pins to form detachable button fasteners.

The die casting machine which produces these button shanks is one of a special design for turning out small parts at high speed. Such a machine is capable of production quantities as high as 320 castings per minute!

INTEGRALLY CAST RIVETS FACILITATE ASSEMBLY

One of the outstanding advantages of the die casting process is its ability to provide fastening elements as integral parts of a casting. These elements usually take the form of studs or rivets, either hollow or with hollow ends, and assembly is completed by merely riveting, staking or spinning over the ends. This makes it unnecessary to provide and to handle



The cutaway shows the mating of rivets and cored holes.

THE

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ALLOY POT

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STEEL MAGAZINE EDITION

separate fastening elements, and effects considerable savings.

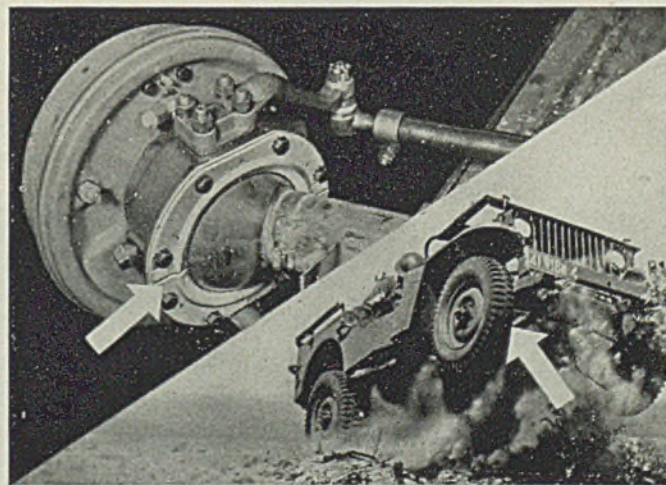
An interesting case in point is the assembly illustrated in the drawing below. Several integral studs on one ZINC Alloy Die Cast part mate with cored holes in another casting. When the mating castings are put together, assembly is effected by simply heading over the ends of the rivets.

ZINC ALLOY DIE CASTINGS ARE TOUGH

The ability of ZINC Alloy Die Castings to "take it" is graphically illustrated by the die cast grease seals for steering knuckle universal joints on Army "Jeeps." One part stands up on a "Jeep" it will stand up almost anywhere.

Here is what the manufacturer of the "Jeep" axle assemblies has to say about the die cast grease seals: "This seal has proven highly satisfactory . . . is sturdy enough to withstand abuse from flying stones and gravel and cannot be torn off by striking sticks, stumps, small trees and rocks." "It will stand up almost anywhere."

The strength of ZINC Alloy Die Castings exceeds that of most other commonly cast materials. For specific technical data on strength and other properties we suggest that you read the bulletin "Zamak Alloys for Zinc Alloy Die Castings." Just ask us for a copy—on your company letterhead.



The die cast grease seals serve in a vulnerable spot.

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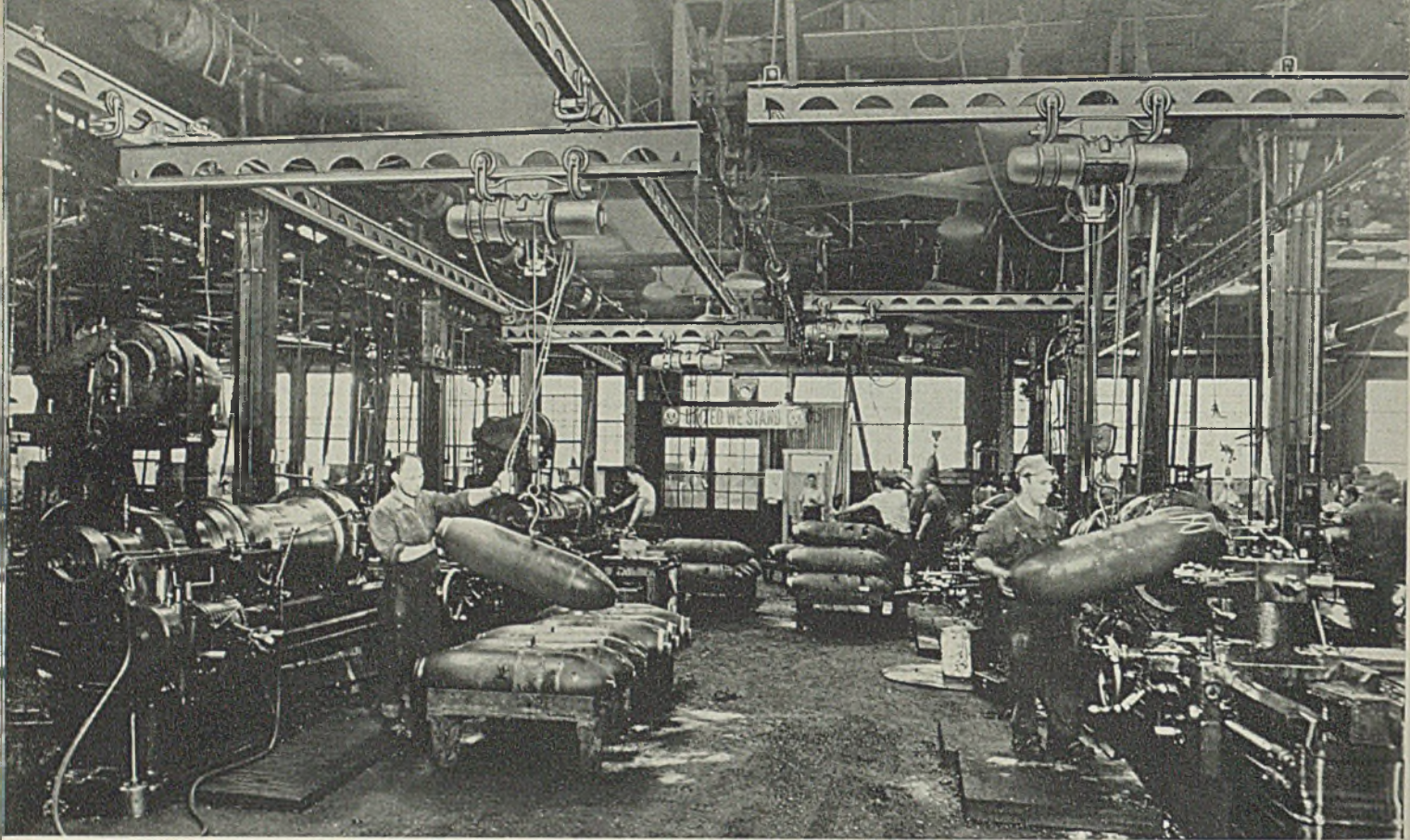


Fig. 1—Final machining and threading of the bomb ends is done in this machine shop. The several bays of the building are served by a number of short span cranes with push-button controlled electric hoists. Approximately one crane or hoist is provided per machine here

Better Handling Equipment

SPEEDS BOMB PRODUCTION

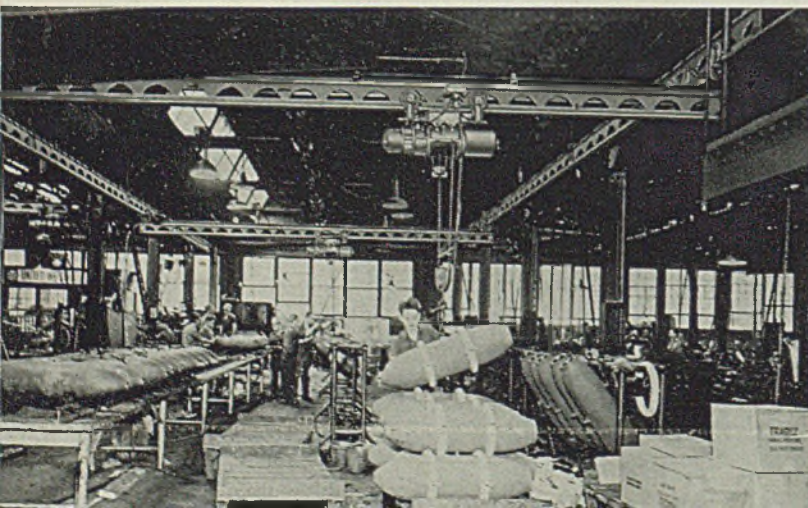
Fig. 2. (Left, below)—Bombs are given final inspection and painting here and readied for shipment. They are moved with overhead handling equipment. All photos from Cleveland Tramrail Division, Cleveland Crane & Engineering Co., Wickliffe, O.

Fig. 3. (Right)—Overhead cranes with electric hoists handle bombs in this inspection and intermediate storage department

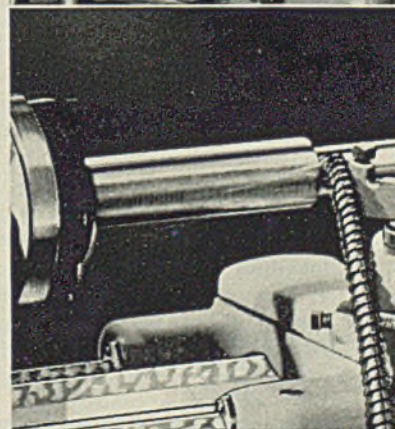
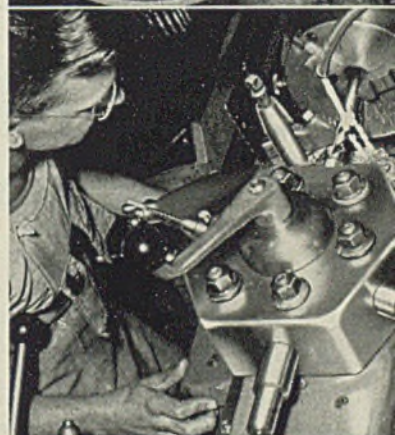
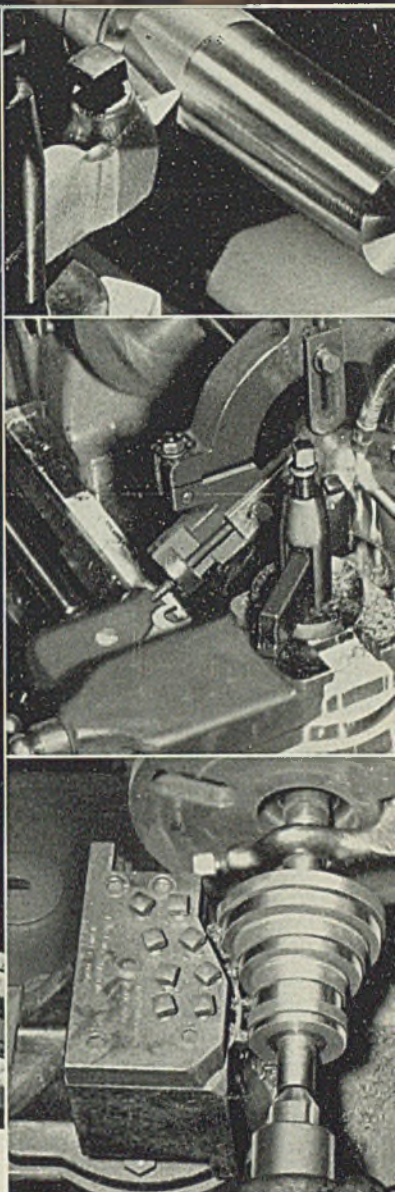
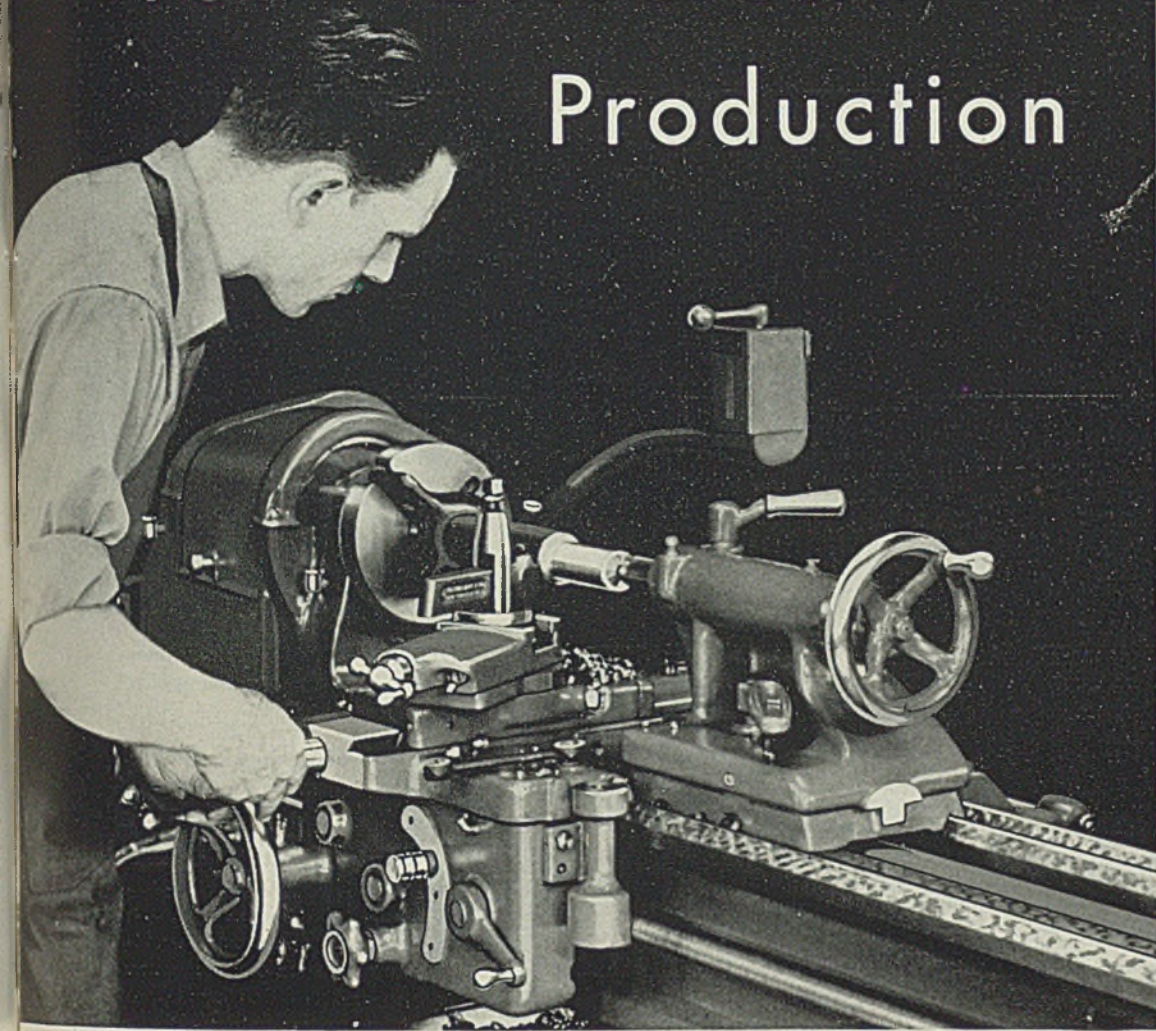
AN EFFICIENT Cleveland Tramrail system is considered especially important in the production of bombs in the plant of a large Pennsylvania steel company—a plant recently awarded the coveted Army-Navy "E" for meritorious work.

As the overhead monorail handling system serves every department from the beginning to the completion of the bombs, it is of paramount importance that this equipment operate smoothly at all times, seven days a week, 24 hours a day. Since its installation two years ago when the plant was converted for bomb manufacture, the handling equipment has done just that. The work is hot, hard and dirty. So the equipment must withstand the most rigorous of operating conditions.

The bombs are made from heavy plates of high-tensile-strength steel. The plates are fed to the traveling conveyors of two furnaces by means of a Cleveland Tram-



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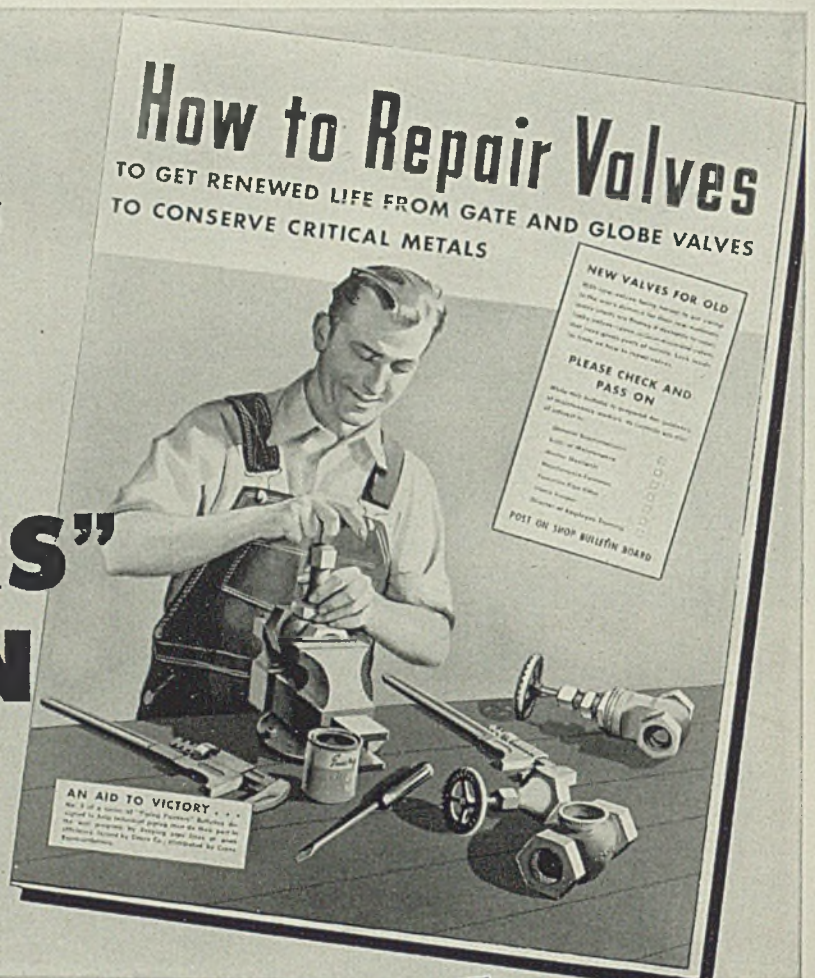
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AFTER almost 100 years of speculation and planning, the iron ore and coal resources of Utah are seemingly about to rise to a position before only hoped for in the industrial and economic life of the western part of the United States. The far-reaching influence of the projected iron and steel development now under way in Utah and the West is not easy to measure accurately, but that it is one of the most significant economic events ever to occur in Utah there can be little doubt, and for the entire West it will have far-reaching consequences.

Iron and steel occupy a position in our modern economic life of tremendous importance—approximately 30 per cent of all of the employment in manufacturing in the country is based on iron and steel materials. The West has heretofore had only a small portion of this important segment of industrial activity. Employment is not extensive in the first stage of production, that of pig iron, a segment of which has been established in Utah for 18 years, but it becomes extensive as we move out toward the

Initial blast furnace of the Columbia Steel Co. at Provo, Utah

more and more finished steel products.

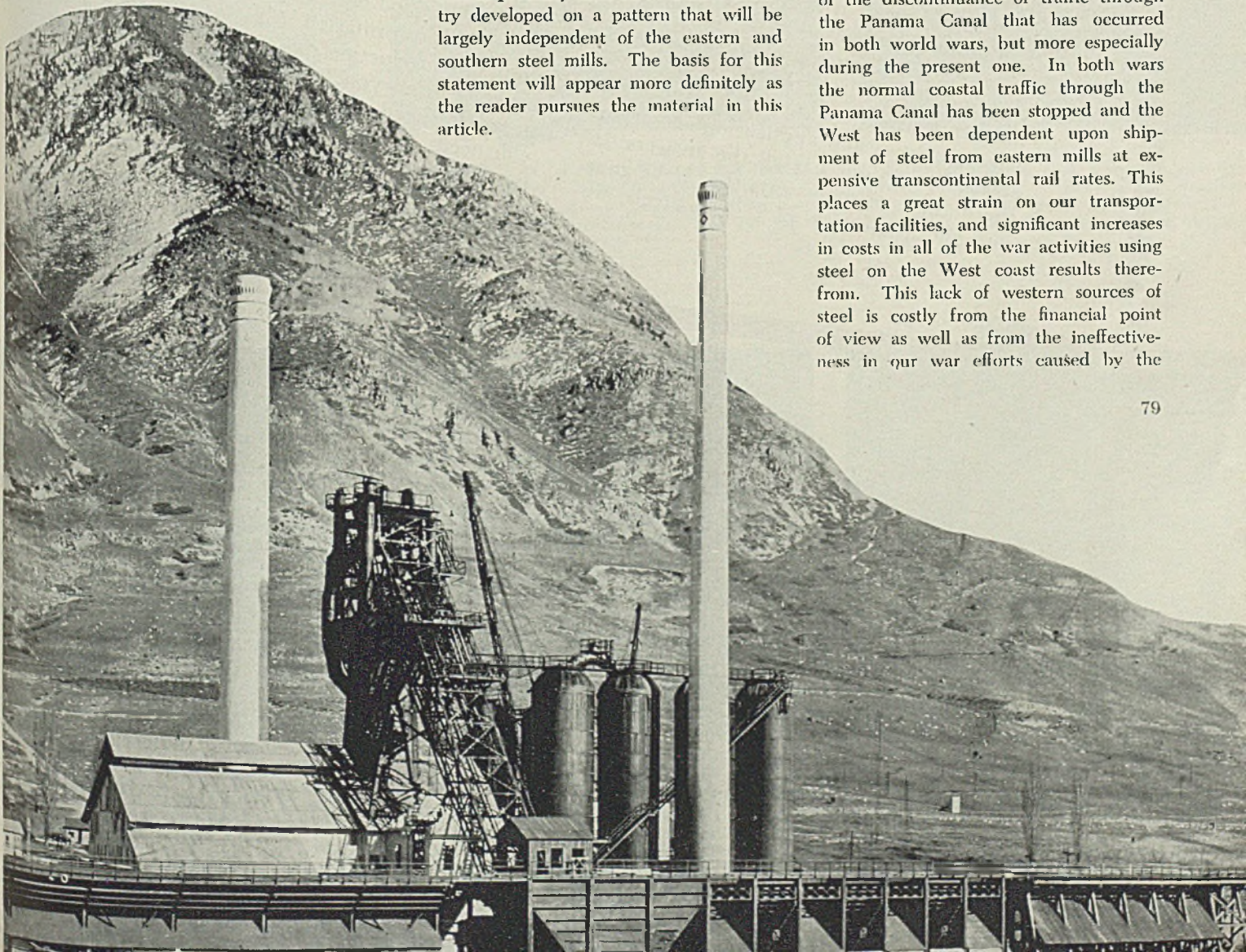
Marked increases in mining activity for coal, iron ore and limestone necessary for the new blast furnaces will add significantly to Utah's economic structure. To meet the needs of iron ore for the installed capacity of the blast furnaces at both Ironton and Geneva will require approximately 4,000,000 tons of iron ore per year. The coke for this operation will require about 3,650,000 tons of coal, an amount in excess of the entire Utah production in some recent years, and to this must be added more than 900,000 tons of the limestone. All of this adds up to mining operations on a large scale.

The great increase in blast furnace and steel capacity projected for Utah is definitely a segment of the industrial pattern that is developing in the western region of the United States and is one of the great new activities knitting the industrial fabric of the West together, with Utah definitely assuming an extremely important part in that pattern. One can not help but be convinced that this development is long overdue. The rapid growth of the western part of the United States and its potentialities have brought us to the point where the West should probably have its own steel industry developed on a pattern that will be largely independent of the eastern and southern steel mills. The basis for this statement will appear more definitely as the reader pursues the material in this article.

Development of Western IRON and STEEL Industry

By J. R. MAHONEY
Director, Bureau of Economic
and Business Research
School of Business,
University of Utah
Salt Lake City, Utah

Aside from the basic economic factors supporting this western steel development, there is the military aspect growing out of the discontinuance of traffic through the Panama Canal that has occurred in both world wars, but more especially during the present one. In both wars the normal coastal traffic through the Panama Canal has been stopped and the West has been dependent upon shipment of steel from eastern mills at expensive transcontinental rail rates. This places a great strain on our transportation facilities, and significant increases in costs in all of the war activities using steel on the West coast results therefrom. This lack of western sources of steel is costly from the financial point of view as well as from the ineffectiveness in our war efforts caused by the



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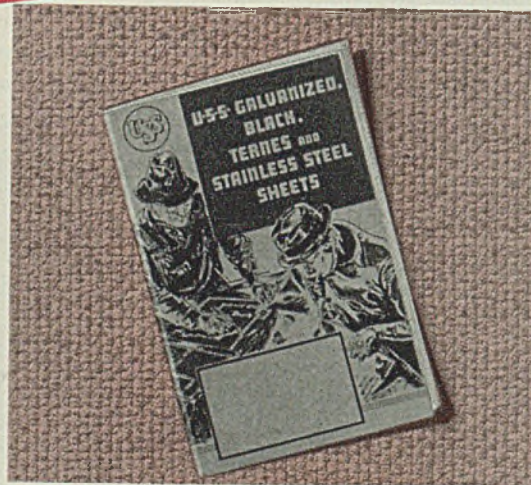
Take steel, for instance—the most basic material of war. Individually, experienced industrial designers know a lot about the characteristics and application of various steels, but no one has all the answers. In the millions of man-years that have gone into the production of U·S·S Steels, we

have gradually accumulated a tremendous reservoir of facts on this key material. These facts (if not subject to military secrecy) are available to you—either in our published literature or in any other way we can communicate them.

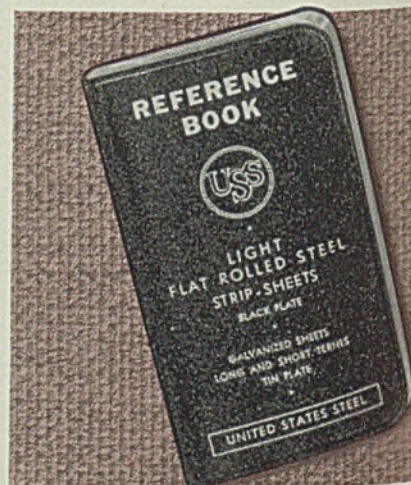
Look over the books illustrated and briefly described on these two pages. Will any of this information help you to make your war production more *productive*? If it will, send us your request on your business letterhead, and we'll mail the books you need. Address any of the companies listed below.



U·S·S PAINTBOND BONDERIZED GALVANIZED STEEL SHEETS. Complete information on the characteristics and application of this special galvanized sheet, which is Bonderized to give it the quality of immediate paintability, plus the ability to hold paint longer.



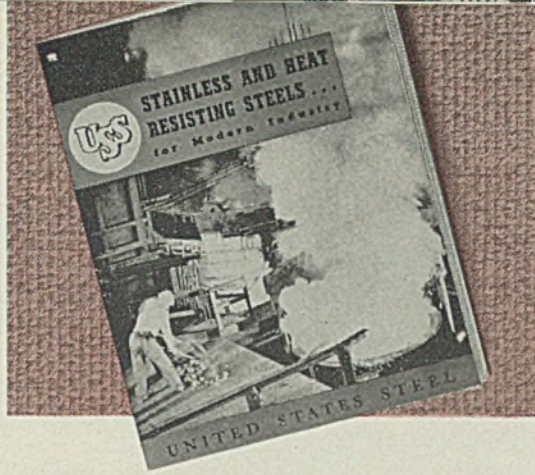
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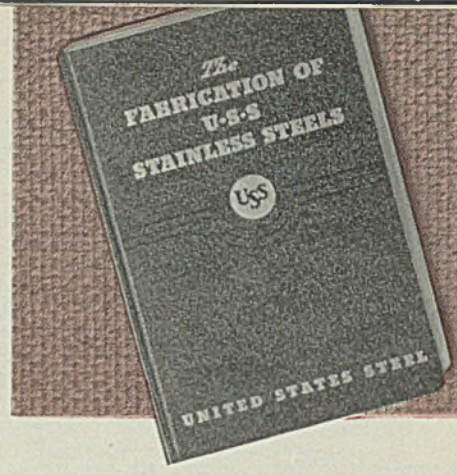
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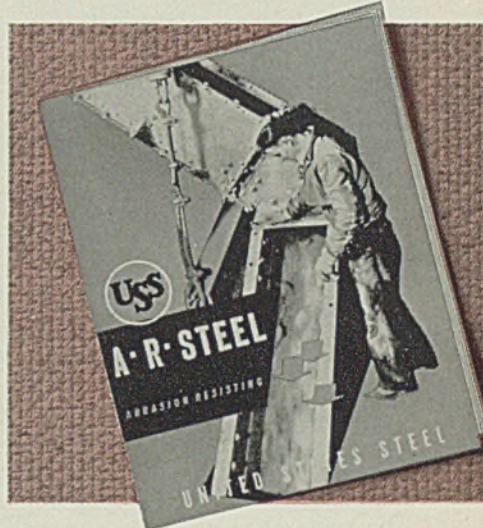
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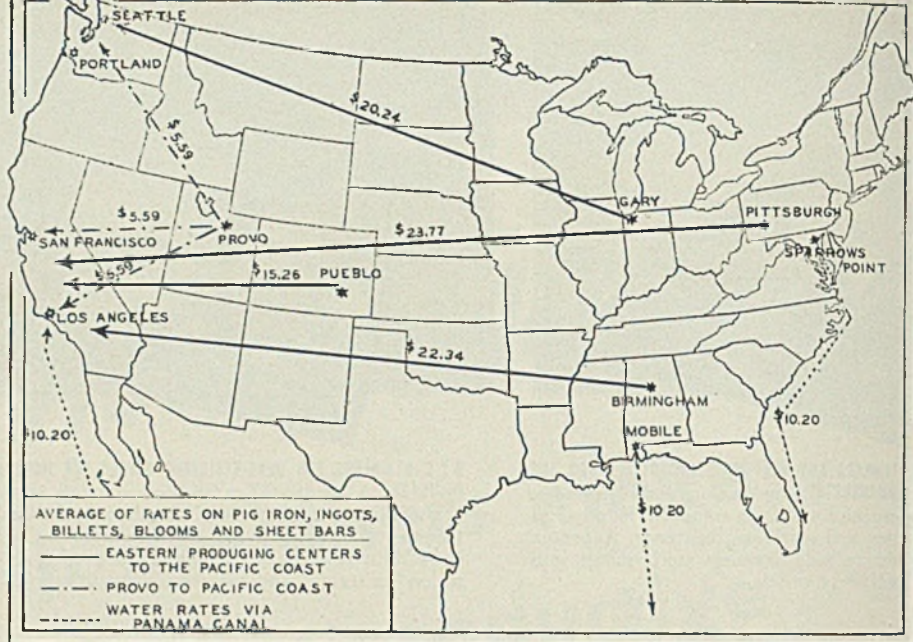
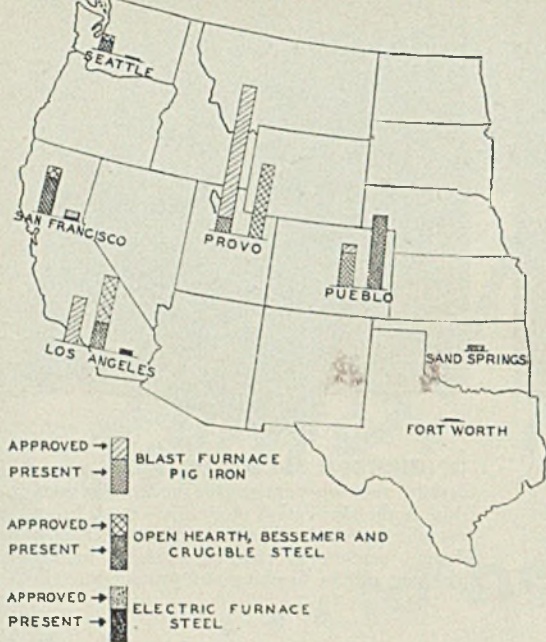


UNITED STATES STEEL

Whether you are designing to meet the needs of today or tomorrow, we can help you select the right materials from these U-S-S Steels:

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- U-S-S Copper Steels** to give twice the atmospheric corrosion resistance of plain steel at little additional cost.
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- U-S-S Carilloy Alloy Steels**—Special steels for the special jobs of industry.
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- U-S-S Vitronamel**—Designed especially for porcelain enameling. Etched to give excellent adhesion and finer finish.

IMPORTANT—All available steel is needed for applications essential to war. If your designs qualify and you have been granted sufficiently high priorities, we will serve you to the best of our ability. In any case, we will be glad to help you plan for the use of steel in your designs for the future.



Left, above, Western iron and steel capacity showing present capacity and approved expansion. Right, freight rates on iron and steel products from production centers to Pacific coast points, in dollars per gross tons

delay in shipbuilding and other basic war industries.

To the extent to which there is a sound economic basis for this western steel development, there would be a close approach to making the West independent for its main steel needs, except possibly in specialized types where the limited consumption in the West would not merit duplication of specialized eastern plants. As long as the market is only partially supplied from western plants, the competitive situation must be such as to still make the price enough to cover the cost of transportation from the East or part of this must be absorbed by the eastern plants. For most steel products, the West must now pay from 20 to 30 per cent more than current prices near eastern steel centers.

The prominent position of the iron and steel industry in our modern industrial picture has meant that the lack of a full complement of these steel facilities in the West has been a factor in the retardation of this area. A more complete development of steel facilities should remove a great handicap to western development and provide for an important increase in population and industry that would in turn increase the needs for more steel and lead to still further development. At this point one can not help but speculate on the possibilities of expansion in the trade relations between the United States, China, India and other Pacific areas that may follow the successful culmination of the present world war and what this may mean in the way of increased steel production in the West.

The basic soundness of this development in Utah and the West hinges, of course, on certain fundamental factors. In the first place, the presence of raw materials in sufficient quantity and quality is required such as will give the proper foundation to the industry. Next comes

the cost of assembling the raw materials—iron ore, coking coal and limestone used to produce the basic pig iron. This cost of assembly is of great significance because it takes in excess of 4 tons of the raw materials to produce 1 ton of

Table I—Estimated Assembly Costs in the Production of Pig Iron

Producing Center	Ore	Coal	Flux	Total
Birmingham, Ala.	\$1.25	\$1.64	\$0.09	\$2.98
Gary, Ind.	3.52	3.99	0.26	7.77
Pittsburgh	5.88	0.31	0.37	6.56
Utah	2.87	2.30	0.14	5.31

pig iron, the basic product of the steel industry. The blast furnace plant location, therefore, needs to be such as will minimize these costs, but other factors must also be considered.

There must be sufficient market served by the plant so that its size will be large enough to secure the economies that can only come with large plant installations. But this is no longer a problem for an extensive steel development in the West.

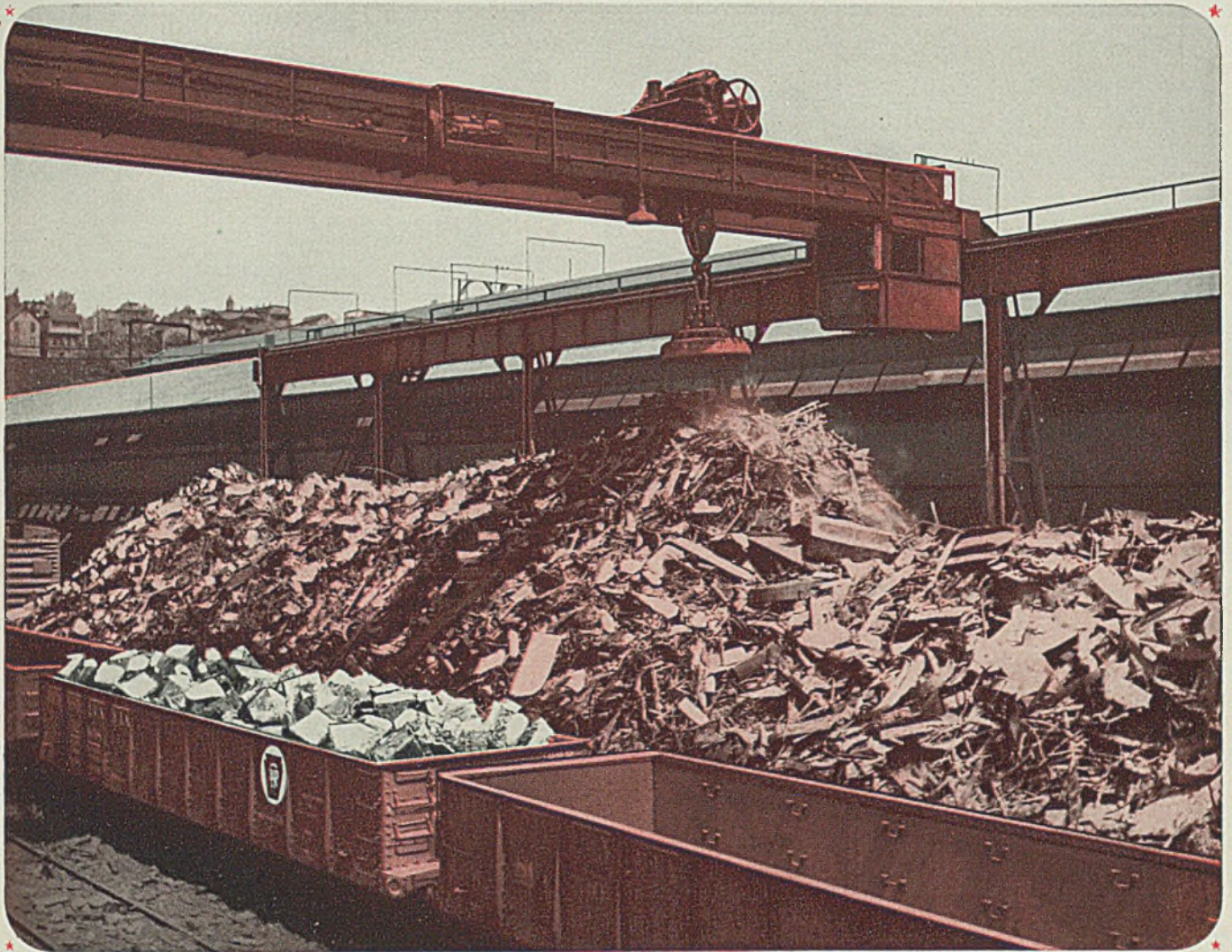
The western region will show some important increases with this steel development and then the proportionate part of the economy of the country as a whole represented by the West would be still further increased. These broad generalities will be treated more specifically to bring out the fundamental factors on which the economic soundness of this steel development depends.

The most fundamental factor drawing the iron and steel industry to Utah is the tremendous resources in coal. The virtual absence of coal in the regions of the United States west of Central Utah is a striking feature of the basic factors shaping the pattern of western industrial development. The coal resources of Washington are seemingly not favorable for use in the steel industry mainly because of their high ash content.

For blast furnace operations the coal needs to be of the coking variety. While most Utah coals are not coking types yet fairly large areas are, and the quantity is sufficient for a large iron and steel development. Full information on the ex-

Table II—Cost of Materials Per Ton of Pig Iron

	Iron Ore	Flux	Coke	Total
Birmingham				
(Value of ore at mine \$1.65 per ton) (2.7 tons)	\$4.45	\$0.30	\$3.40	
Cost of Assembly	1.25			
	\$5.70			\$9.40
Gary				
(Value at mine \$2.59 per ton)	\$4.80	\$0.15	\$5.74	
Cost of assembly (1.85 tons)	3.52			
	\$8.32			\$14.51
Pittsburgh				
(Value at mine \$2.59 per ton)	\$4.80	\$0.15	\$3.38	
Cost of assembly (1.85 tons)	5.88			
	\$10.38			\$14.51
Utah				
(Value of ore at mine \$1.00 per ton)	\$1.85	\$0.45	\$4.60	
Cost of assembly (1.85 tons)	2.87			
	\$4.72			\$9.77



O E M Photo by Palmer, in an Allegheny Ludlum plant

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But don't stop there! Rounding up the scrap and instituting more thorough salvage methods are only part of the job of conserving the nation's resources. Start at the beginning and make better use of *new* steel . . . aim to get more finished products out of it, with less waste.

That is particularly necessary with electric-furnace steels, and the critical alloys they contain. There are many ways to save. Both stainless and tool steels can be more efficiently selected and better used, to step up production and cut down the amount of rejects and spoilage. The substitution of lower alloys, and of standard analyses, sizes or finishes instead of special ones, all offer good opportunities to save.

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Table III—Comparative Freight Rates on Selected Iron and Steel Commodities to the Pacific Coast*

	Pig Iron \$ Gross Ton	Ingots, Billets, blooms \$ Gross Ton	Sheet Bars \$ Gross Ton
All-Rail Rates:			
Ironton, Utah	\$4.95	\$5.78	\$6.05
Pueblo, Colo.	7.70	19.04	19.04
Gary, Ind.	11.44	24.64	24.64
Birmingham, Ala.	13.70	26.66	26.66
Pittsburgh	15.41	28.45	28.45
Water Rates:			
Sparrows Point, Md.	10.20	10.20	10.20
Mobile, Ala.	10.20	10.20	10.20

*Freight rates compiled from special reports from freight agents in eastern and southern steel regions and compared with a report prepared by H. W. Prickett, traffic counsel, Department of Publicity and Industrial Development, State of Utah.

Table IV—Western Steel Capacity (Gross Tons)

Producing Center	Present	Additions	Total
Pueblo			
Blast furnaces	564,000	84,000	648,000
Open hearth	1,131,210		1,131,210
Electric			
Provo			
Blast furnaces	193,000	1,835,000	2,028,000
Open hearth		1,098,000	1,098,000
Electric			
San Francisco			
Blast furnaces			
Open hearth	554,970	120,000	674,970
Electric	22,000	84,000	106,000
Los Angeles			
Blast furnaces		607,000	607,000
Open hearth	328,100	652,000	980,100
Electric	45,100		45,100
Seattle			
Blast furnaces			
Open hearth	165,000	60,000	225,000
Electric	8,000	7,000	15,000

tent and quality of Utah coking coals is not readily available, but that the coal used for these purposes in the past has been satisfactory there can be little question. Since the technique of coking practice is improving the extent of coal suitable for coking is progressively enlarged. Before steel reaches its final stage ordinarily 3 or 4 tons of coal per ton of finished steel are required; this includes about 2 for the coke used in the blast furnace and about the same amount beyond. It can readily be seen that the presence of great deposits of coal of proper quality that can be economically mined is a matter of great significance for the location of an iron and steel industry. This is Utah's chief claim to a prominent part in western steel development. The scarcity of such deposits makes any location west of Utah of doubtful economic soundness.

Not only does Utah have ample tonnage of coal, but the physical features governing its production, such as nearly horizontal position of the beds, thick seams—8 to 16 feet thick, no necessity of hoisting, favorable roof and floor conditions and other factors making for economical mechanized mining, are present in highly advantageous relationships.

Utah coals are more volatile and will yield less coke per ton than eastern coals—about 53 per cent as compared to 67 to 70 per cent. But the volatiles constitute a credit and the larger per cent in Utah coals will furnish more gas,

ammonia, tar, oils, etc., per ton of coke produced.

The quantity of iron ore available in Utah is one of the two most basic factors in the raw material situation on which the economic soundness of the iron and steel industry in the State rests. Official and reliable estimates of the tonnage of the southern Utah iron ore deposits in Iron and Washington counties are not readily available. The 40,000,000-ton estimate of Leith and Harder as given in the Geological Survey Bulletin No. 338, published in 1908 has proved to be far too low as careful work since has demonstrated an amount more than double the original with exploration still incomplete. Much of the territory that is now being explored by government agencies was not included in the former studies.

Preliminary work in some other areas would indicate that considerable additional quantities will be added when

sufficient additional exploration is completed. It has been the experience of most districts that early estimates are almost universally conservative. The iron ore deposits of southern Utah are not easy to estimate without careful geological and geological exploration and actual test drilling. In any event the amount of iron ore available for the projected plants in Utah is greatly in excess of the present high-grade iron ore reserves that serve as the foundation of the steel mills in the Chicago, Pittsburgh and Ohio Valley areas when compared with the installed capacity in those regions.

Differences in taxes on iron ore are significant as between Utah and Minnesota iron ore fields. On the basis of a study made by the author and covering the period from 1926 to 1932, the total taxes on the iron ore properties were only 1.6 cents per dollar of gross income which amounted to virtually 1½ cents per ton of ore mined. But the Minnesota taxes in periods of low production sometimes amount to 75 cents or more per ton and in normal years from 40 to 50 cents per ton. This is a marked advantage for a steel plant using Utah iron ore. Alabama has a severance tax of 4½ cents per ton of iron ore in addition to an ad valorem tax, but the tax burden is much lighter than in Minnesota.

In records of the Utah State Tax Commission the cost of mining iron ore in Utah is placed at just a little in excess of 35 cents per ton, and the value per ton is given at 95 cents making 60 cents the net value at the mine. This would indicate that the dollar figure placed on iron ore for Utah is ample for present conditions. However, it is being used in anticipation of the possibility that the mining of some of the other iron ore deposits may not be as economical as those mined at present.

A number of factors always determine the location of industries. Some of the most important are: An early start by pioneer manufacturing enterprises, strategic transportation advantages, nearness to the sources of raw materials, accessibility to consuming markets and

(Please turn to Page 100)

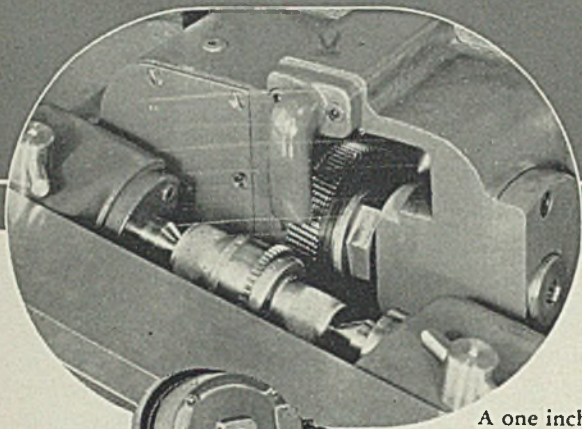
Table V—Blast Furnace and Steel Capacity—Net Tons* (As of April, 1942)

Distribution by Districts:	Annual Blast	
	Furnace Capacity	Capacity
Eastern	11,781,750	18,105,250
Pittsburgh-Youngstown	24,321,820	37,447,200
Cleveland-Detroit	6,008,930	7,825,840
Chicago	12,916,450	18,953,210
Southern	4,258,830	3,598,000
Western	971,800	2,341,130
Total	60,259,580	88,270,630

*American Iron and Steel Institute.

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NICKEL ELECTRODEPOSITS

(Concluded from Sept. 7 Issue)

IN ORDER to produce deposits for any particular purpose, it has been found very practical to alter conditions to correspond with requirements. Thus, for moderately deep forming or general fabrication, when a soft No. 4 temper steel is required as a base, nickel having stiffness values and properties as illustrated in Fig. 3 should be applied. When material is to be used in flat form such as for ferrotype plates or where abrasion may be a factor, deposits of the hard

*Now with Empire Plating & Mfg. Co., Chicago.

By F. P. ROMANOFF*
Apollo Metal Works
Chicago

type are recommended. As tensile strength tests on nickel deposits are not readily made because of the tendency for specimens to fracture in the jaws of the usual tensile testing machines, the stiffness testing machine seems to be especially adapted for determining the physical properties of nickel electrodeposits. Control of conditions is easily maintained for the period of time required to obtain 0.010 to 0.020-inch of deposit, using a starting sheet of tinplate, aluminum or passivated steel.

Current density values are given for each nickel deposit tested and the results show that current density is not a factor for obtaining characteristic deposits of any particular type. Therefore, from 6 to 8 hours may suffice in most cases to produce the required deposit thickness for stiffness tests with proper operating conditions in modern high-speed baths. Table I is a general resume of the values obtained in tests, including conversions for comparison.

Note that any conversions referred to here are approximate and used only to indicate the relationship to other means of testing. Because physical tests in general result in cold working properties. This means that numerical values obtained in most physical tests cannot be converted with mathematical exactness. These features apply also to electrodeposits. However, it is of considerable

Fig. 7—Micrograph of cross section of Erichsen cup drawn to 0.275-inch. Nickel is 0.0002-inch thick. This is a ductile nickel deposit on copper

interest to compare these different tests.

Tensile tests of electrodeposits are difficult to reproduce because of many factors. If a deposit is made heavy enough to be machined, difficulties in maintaining bath and operating conditions long enough make it impossible to duplicate results. At the same time specimens are produced in which properties of the deposit also vary. And the specimen may have varying strata which have no sharp demarcation for separation.

In the case of preliminary tests, it was found that the starting surface of specimens had rockwell hardness values differing as much as 12 points from those values obtained on the final surface when appreciable thicknesses were deposited.

Reproducible Results Difficult

Precautions were necessary to get reproducible results, particularly when low-current-density specimens were prepared requiring a long time for deposition.

Photomicrographs were taken of Erichsen cups of ductile and medium ductile specimens. The photomicrographs show the cross section at the greatest stressed area of the surface. Fig. 7 illustrates a cross section of a dome of ductile nickel of 0.0002-inch on a copper base. The nickel has been stretched uniformly over the stressed cup and shows no breaks at any point. Fig. 8 is a cross section of a dome of medium nickel of about the same thickness and shows a fractured point in the dome of the cup. These magnifications are at 400 diameters. Similar photographs on steel bases showed the same conditions.

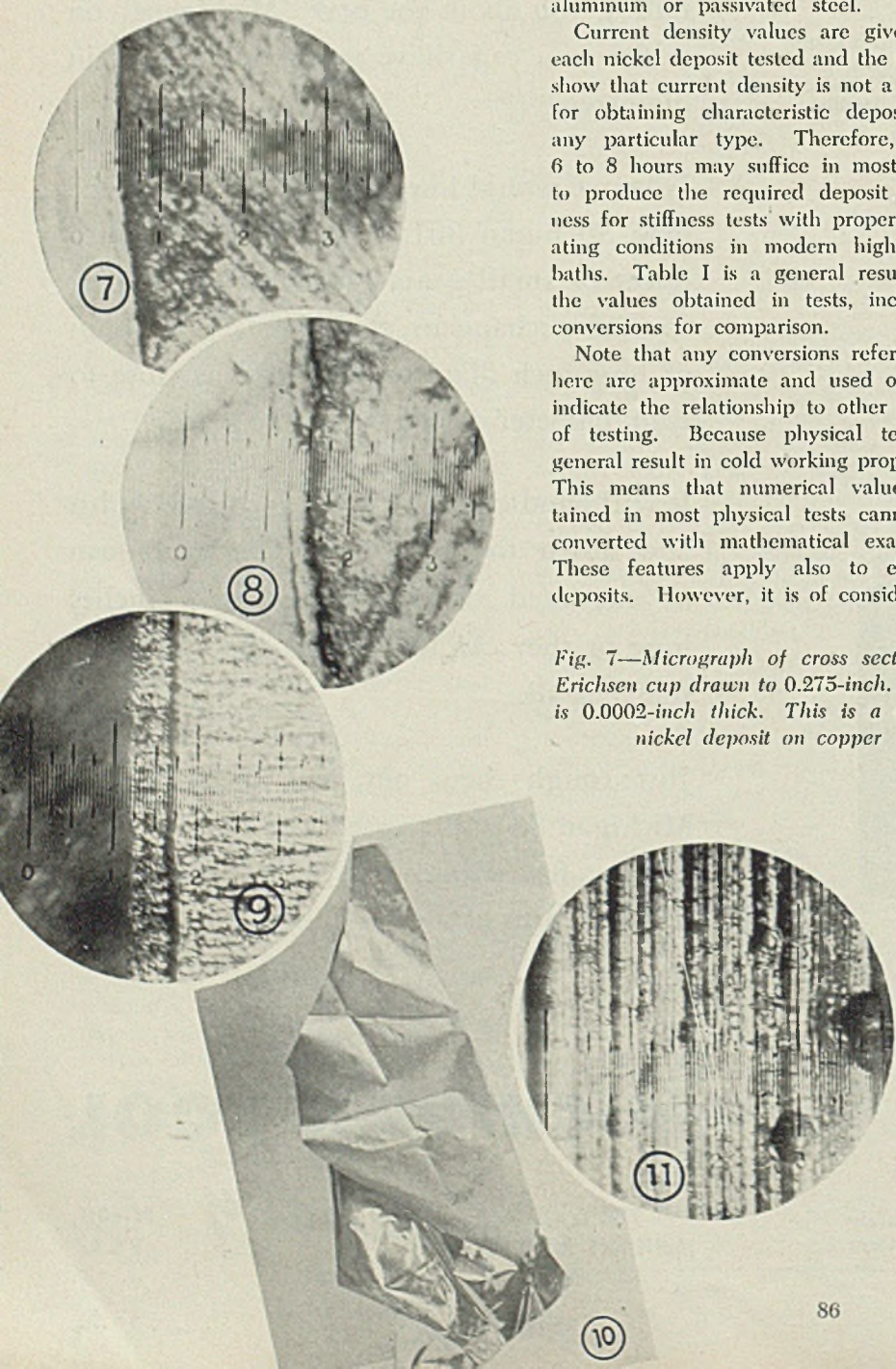
If more severe fabrication is performed on nickel-coated copper, the copper surface has a tendency to be broken up. When the nickel was applied to a steel

Fig. 8—Same type of test as Fig. 7 but on medium nickel deposit, 0.00025-inch thick. All micrographs are shown at 400 diameters. Note break in deposit here

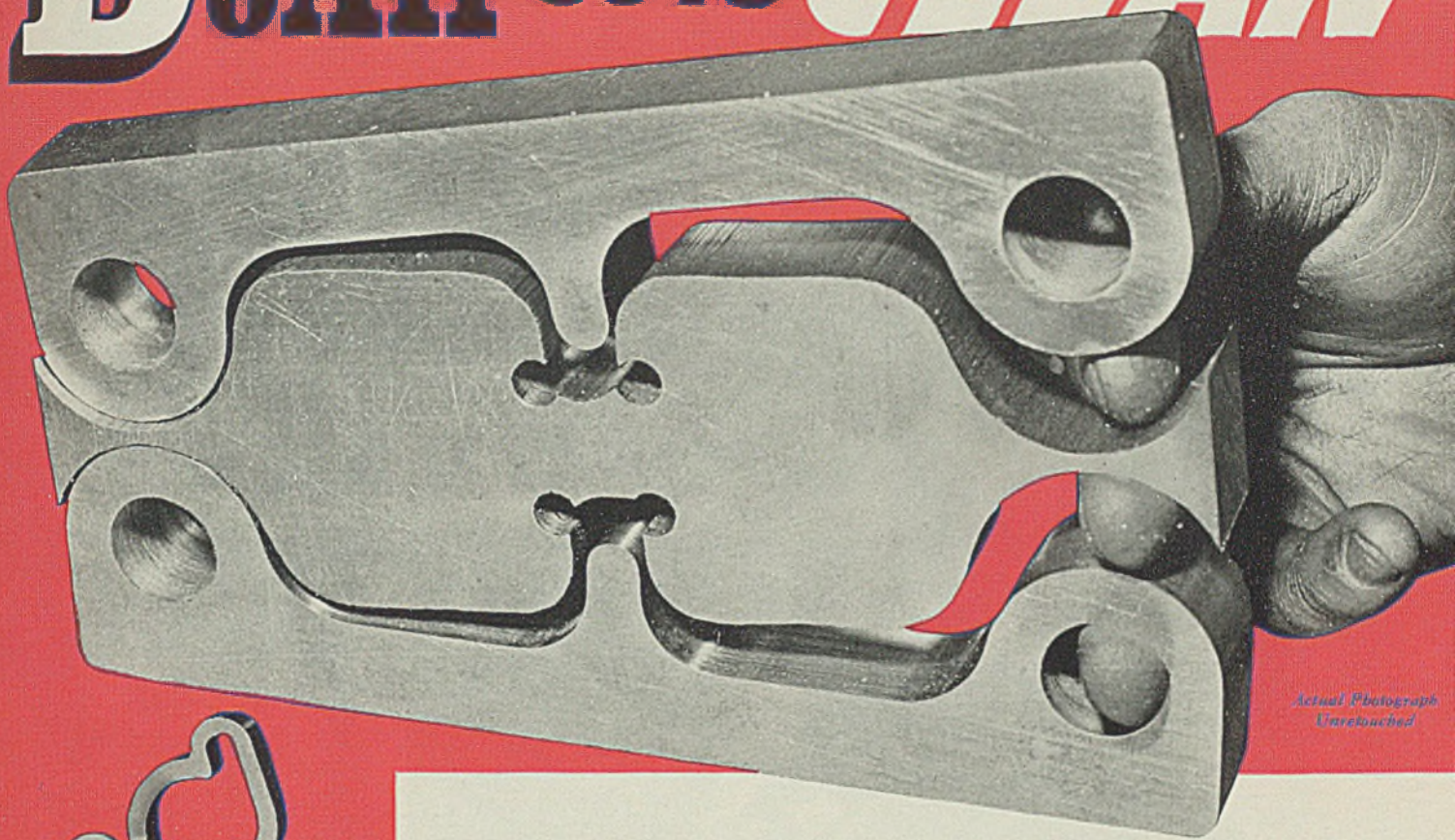
Fig. 9—Same type of test but on a medium nickel deposit of greater thickness—0.00045-inch

Fig. 10—This bright nickel deposit has a thickness of 0.0005 to 0.001-inch and appears to be ductile according to this type of test. When deposited on a base of copper, the cup tests show extreme brittleness in this and other thicknesses. This deposit was obtained from the same bath as that used to obtain curve 6, Fig. 6 (see Part I of this article)

Fig. 11—Micrograph showing laminated structure of bright nickel, same deposit as shown by curve 6, Fig. 6. See data in Fig. 10 caption



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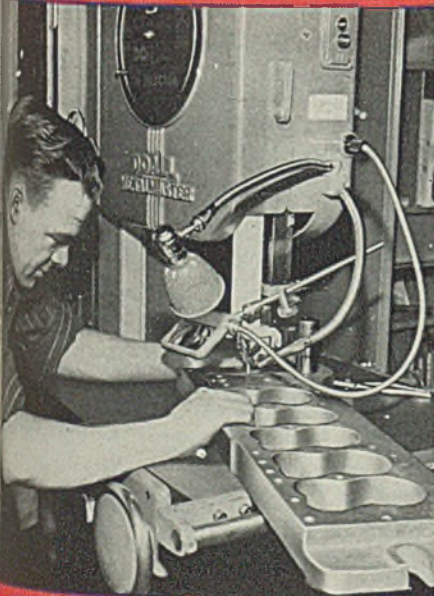
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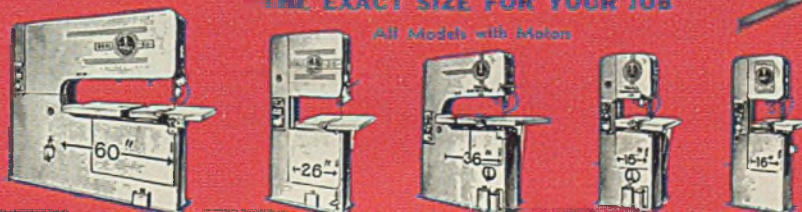
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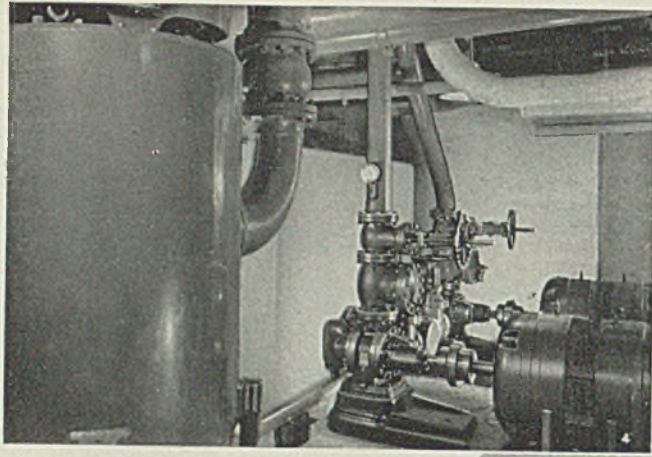
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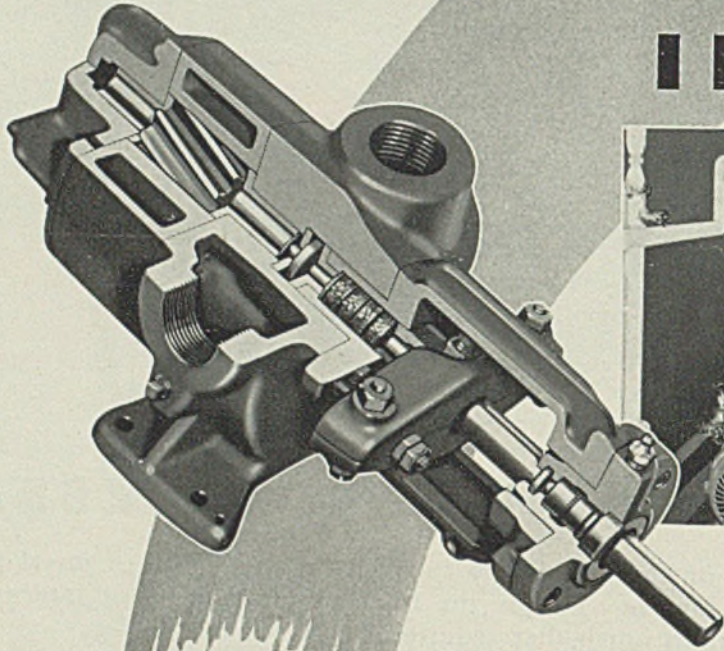




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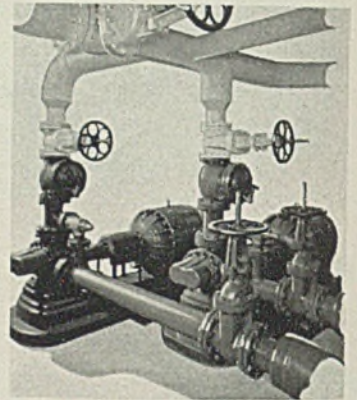
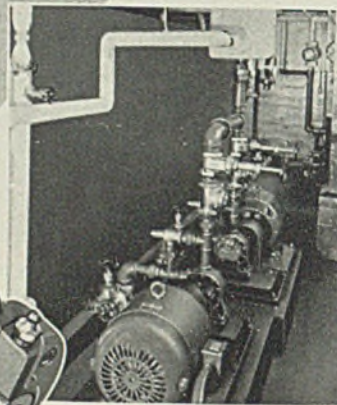
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Fig. 12—Summary of results of stiffness tests on nickel deposits. All below curve 3 were dull nickel obtained under conditions which would produce maximum ductility. Areas of demarcation of different types of deposits overlap somewhat, so are not definite

base, this condition was not observed. This coarseness of the grain upon distortion is a function of heat treatment of the base since in previous tests copper with finer grain could be obtained from certain mills.

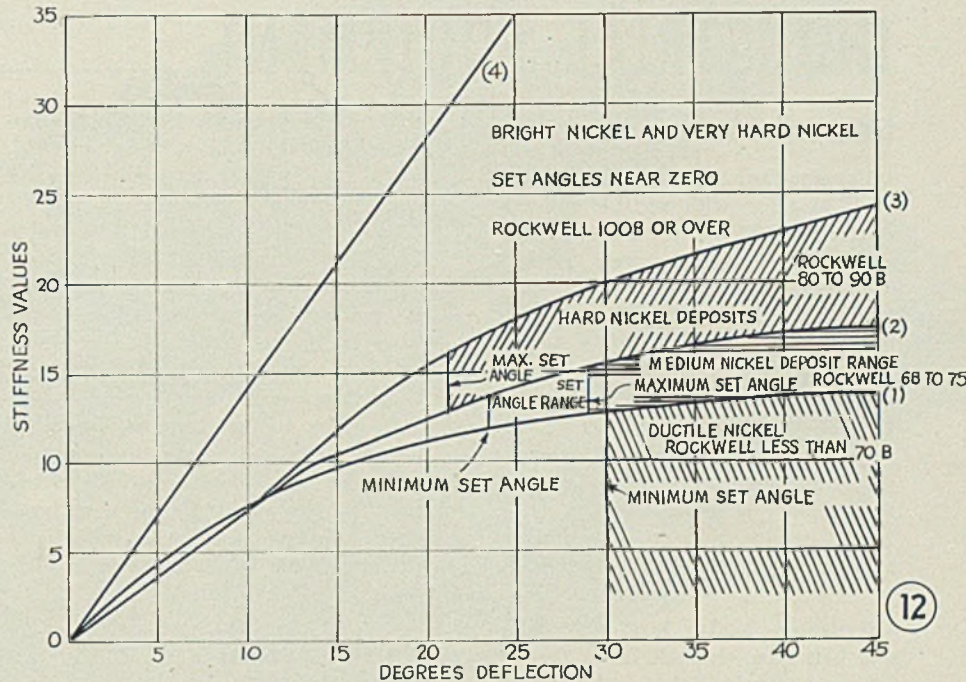
Cross-section micrographs of harder deposits appear exactly like those of the medium deposits with fractures closer and of greater frequency. An attempt to determine the grain orientation of a thicker deposit of double nickel was unsuccessful because of the small field observable at this magnification. The area observed did not cover a great enough contour to distinguish curvature.

Fig. 9 represents a cross section of medium nickel drawn to 7 millimeters and illustrates the possibility of fabrication without loss of corrosion resistance by increasing the thickness of the deposit to 0.0006-inch. The medium nickel deposits in these thicknesses affect the ultimate depth of draw of the combined base and electrodeposit. An Erichsen dome drawn to the fracturing point on a medium nickel deposit will be 2 or more millimeters lower than the depth of draw obtainable without fracture of a specimen with a full ductile nickel deposit.

Likewise the fracture of the Erichsen dome of a hard nickel deposit of these thicknesses will always be several millimeters less. Some tests were made on bright nickel deposits from two sources. One deposit represented an alloy with proper addition agents and the other was one of the nickel baths with organic addition agents. Both deposits were found to be too hard for testing on the Olsen stiffness instrument because of a tendency to form an arch instead of bending at an angle.

This could be overcome somewhat by shortening the cantilever distance, but for comparison the same 1-inch distance was retained. It was impossible to obtain a good bending moment on the one specimen of 0.008-inch thickness. Good readings can be determined on specimens of this thickness in ductile, medium or even the hard dull nickel deposits. But the arching and slipping of this bright nickel specimen prevented any comparative determination.

The other specimens were 0.016 to 0.020-inch thick. Although arching was very pronounced, determinations of stiffness values of different widths and



slightly different thicknesses checked surprisingly close.

Curve 6 in Fig 5 is the average of three different specimens of the same bright nickel deposit. It is very hard and shows no yield point whatever. There was no definite set angle, indicating a complete lack of ductility. The average stiffness at 45 degrees was 56.9, which is twice that of the hard nickel prepared in a bath containing ammonium and potassium chlorides and over five times the value of the best ductile were well over 100, and tests on the superficial rockwell, using the diamond Brale, gave values around 65 N corresponding to a rockwell C value of 58. This compares in value with hard alloy steels.

Shows Common Fallacy

One of these bright nickel deposits also illustrated a common fallacy in determining ductility by a folding test. This test consists of wrinkling or folding a thin layer of nickel about 0.0005 to 0.001-inch thick. If no cracking or breaking occurs, and the cross fold produces no perforations, the deposit is assumed to be ductile.

That this test may be grossly misleading is illustrated by Fig. 10, which represents a piece of exfoliated bright nickel. The deposit varied in thickness over its surface from 0.0005 to 0.001-inch.

Note: In the first part of this article, STEEL, Sept. 7, p. 98, two errors occurred which may have caused confusion. On p. 104, third sentence, first paragraph should read—"The shape of the curve as it passed the elastic limit", etc. In the next paragraph, the first sentence should read—"The angle made by the straight portion of the curves with the horizontal is an indication of the modulus of elasticity, and the break in the straight line corresponds to a yield point or proportional limit. No simple accurate calculation of the modulus of elasticity as determined etc".

As seen in the figure, creasing and folding produced no perforations or cracking. However, the Erichsen cup test showed fracture at a depth of less than 2 millimeters while the stiffness tests indicated practically zero ductility. This deposit showed the laminated structure usually found in bright nickel deposits and is seen in Fig. 11.

A summary of the results obtained on the Tour-Marshall Olsen stiffness tester is shown by the chart in Fig. 12. This method of determining physical properties appears to give consistent values and is more readily applied to the thin electrolytic deposits than most other tests thus far proposed for determining these properties. Quantitative values are obtained rather than qualitative, and routine testing is very practical.

The method should lend itself to similar determinations of electrolytic deposits of copper, zinc and other metals and prove valuable for control when hardness, ductility or other physical properties are desired.

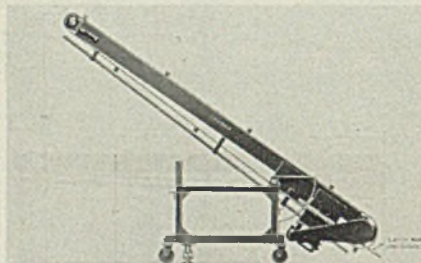
The main factors governing the hardness or ductility of nickel deposits were found to be composition, pH, most organic substances in general, and any materials which would cause interference with grain growth. Current density affected the properties only when other factors were most advantageous. The charts show curves obtained at various current densities to illustrate this point. Comparable nickel deposits could be obtained from any solution tested at current densities varying between 6 and 40 amperes per square foot with only minor solution adjustments, if any.

For permission to publish this work, grateful acknowledgement is made to the Apollo Metal Works.

INDUSTRIAL EQUIPMENT

Utility Conveyor

Lamson Corp., Syracuse, N. Y., is offering to those with suitable priority a new model CM utility conveyor for such applications as piling cartons, packages, bags and boxes; unloading and loading



miscellaneous loads. It is of the adjustable belt type, the belt being about 11 feet long and 14 inches wide. The latter is driven by a 1/3-horsepower single-phase 60-cycle alternating-current 110-volt geared head motor equipped with a 25-foot flexible connecting cord.

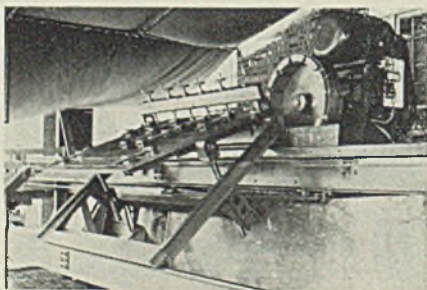
The whole conveyor frame is portable being mounted on 6-inch casters. It can operate either from a horizontal position or incline of 35 degrees. Speed of the unit is about 60 feet per minute.

Plate Grinder

Vonnegut Moulder Corp., 1819 Madison avenue, Indianapolis, announces a new LG type armor plate grinder fabricated of less than one-half of the critical materials that might be needed for a machine of similar capacity.

Consisting essentially of a stationary grinder unit, 45-foot tracks and twin traveling work tables, the grinder bevels straight line edges of armor plate preparatory to arc welding into the shells of tanks and armored cars.

Cutting is provided by a 36-inch di-



ameter abrasive chuck wheel supported on a 6-inch diameter spindle in long tapered bearings with ball bearing thrust collar and powered through 8 strands of V-belt from a 40-horsepower motor.

The two work tables of the grinder are adjusted angularly by means of heavy screws to provide for edge bevels

of 90 to 25 degrees. One table is operated while the other is being unloaded, loaded, and set up, thus providing for almost continuous production.

Table travel is actuated by a cable drive with choice of 25, 30 or 35 feet per minute rate of feed. Each table is connected or disconnected from the cable by quick acting clamps. Cable power is supplied by a 3-horsepower motor driving a cable drum through a pair of reversing friction clutches, speed reduction gears, chains and sprockets.

Grinder shown is set up on a skeleton frame for test purposes. Installed, however, its I-beam track rails and grinder unit are mounted on a concrete foundation.

One-Ton Hoist

Harnischfeger Corp., Milwaukee, announces the inclusion of a 1-ton hoist in the production of its material han-



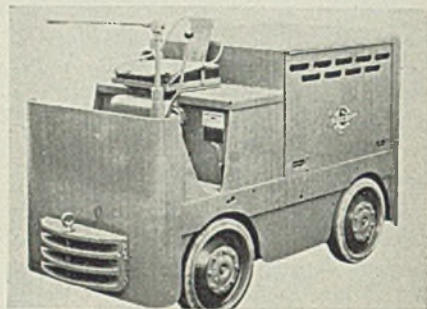
dling equipment. Called Zip-Lift, it is equipped with the same features as the smaller models, a few of which are: full magnetic push-button control, preformed nonspinning hoist cables, 3-way interchangeable mountings, safety type limit switch, double brakes, and dust-and-weather-proof fully-enclosed construction. It is designed for quick interchangeable mounting, either trolley, hook, rigid or bolt. It also can be parallel or cross mounted.

Truck Tractor

Crescent Truck Co., Lebanon, Pa., announces a new model NTTD electric industrial truck tractor powered by two heavy duty drive units, including two motors. Its features include 4-wheel,

extra large external contracting brakes, mounted on worm shaft, providing equal braking on all wheels.

Frame is of heavy construction from

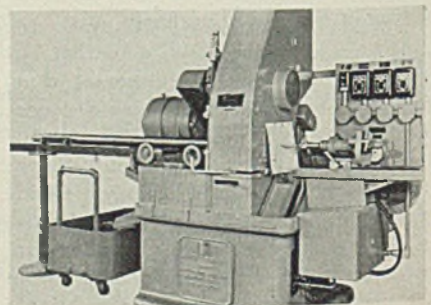


standard plates and shapes, hot riveted and welded into rigid and mono-unit construction. The tractor has a drawbar pull of 800 pounds normal, 3600 pounds ultimate. The overall length is 84 inches, wheel base 48 inches, overall height 59 inches. Travel is controlled by a lever-operated drum-type controller which is interlocked automatically with the operator's seat and brake foot pedal. Battery compartment can be provided for either side or top removal of battery.

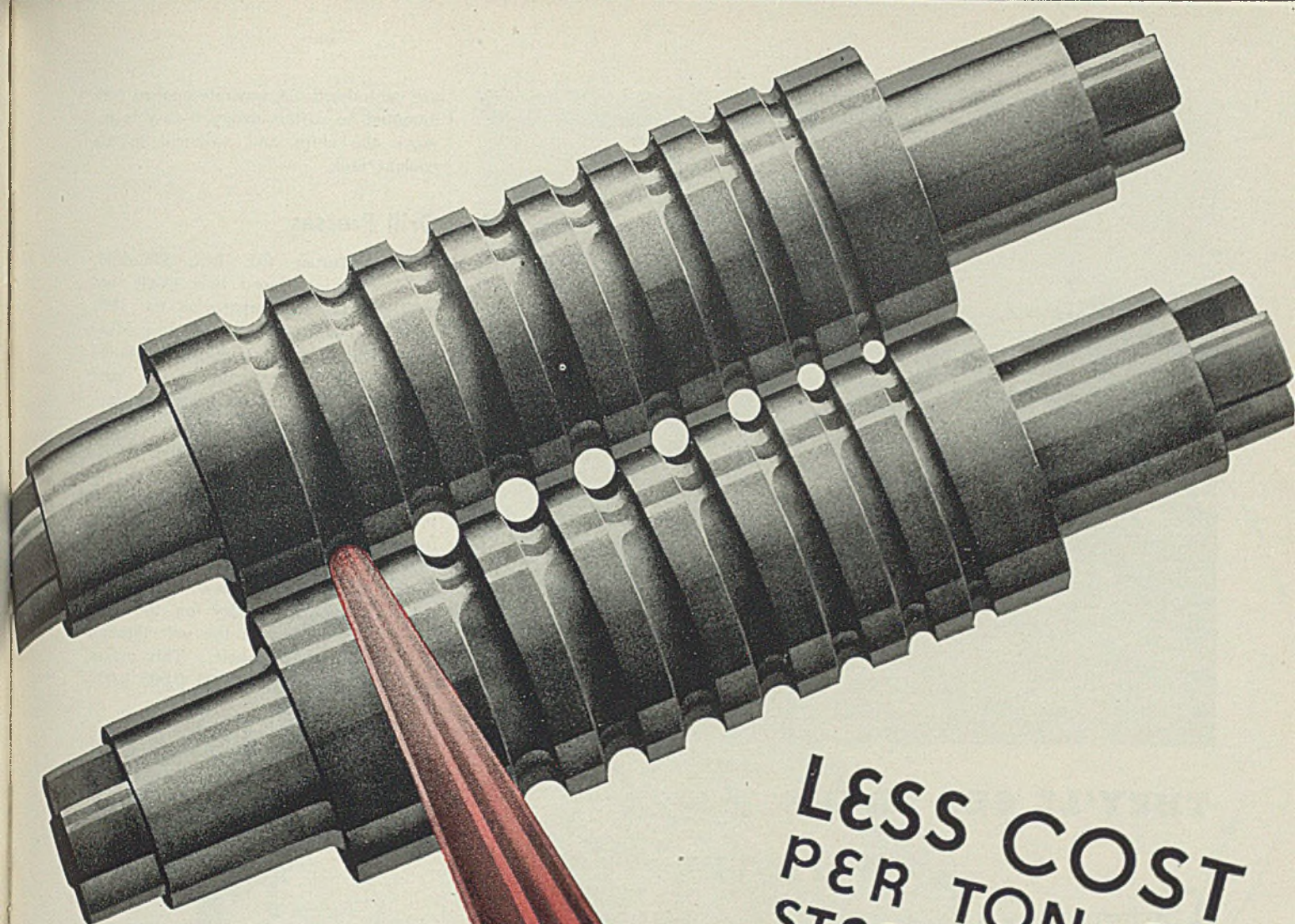
Cutting Machine

Andrew C. Campbell Division, American Chain & Cable Co. Inc., Bridgeport, Conn., is offering a new No. 425 Cutalator wet abrasive cutting machine for cutting any tubular section up to 4½-inch diameter and any solid stock up to 3½-inch diameter. Smooth cuts of the unit are said to be the direct result of an oscillating and rotating movement of the hydraulically fed abrasive wheel and a new controlled coolant system.

The motor is not mounted on the abrasive wheel swing frame. Therefore, cutting characteristics are maintained on the unit, regardless of weight of motor.



Any variation in the weight of the motor does not affect the feeding of the wheel. An adjustable, counter-balancing device permits an exact counter-balance, regardless of weight or size of the wheel operating motor. Controls of the machine



LESS COST
PER TON OF
STEEL ROLLED

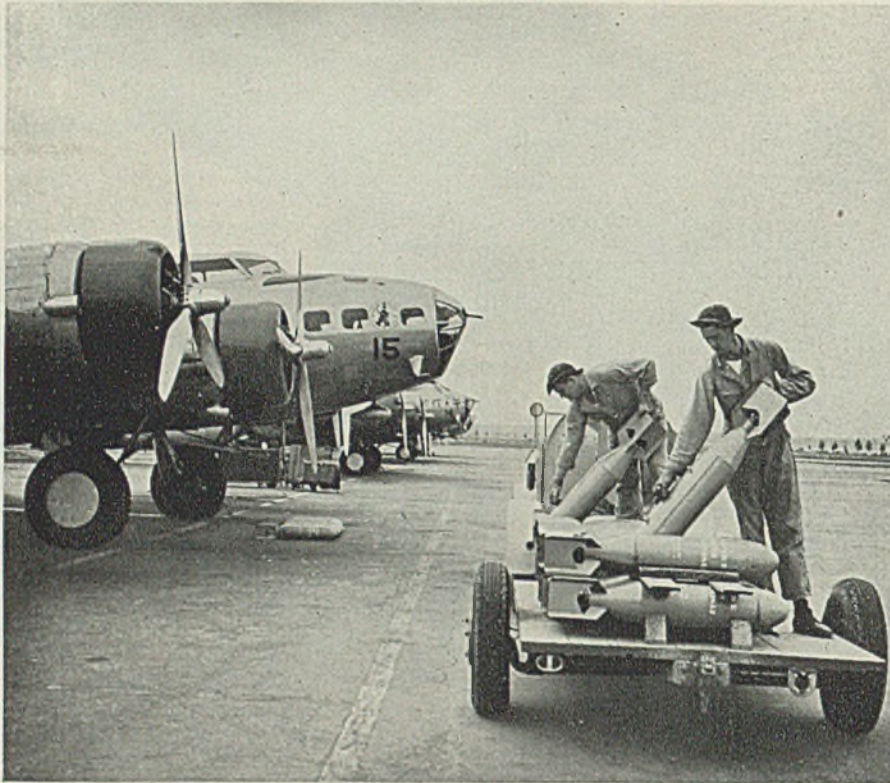
rounds

The men who do the actual rolling in the mills can tell the story of roll performance as no one else can. Ask any mill man about Pittsburgh Rolls.



PITTSBURGH ROLLS

PITTSBURGH ROLLS DIVISION of BLAW-KNOX CO.—“Steel’s Partner” • PITTSBURGH, PA.



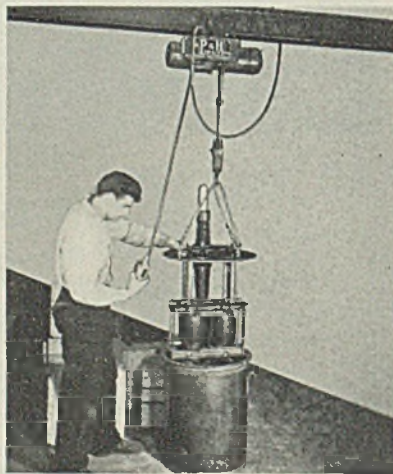
THEY'LL GET THERE *First*
 . . . WITH THE *Most!*

GETTING there "fustest with the mostest" is an axiom as important in the warfare of production as on the battle front. That's why, in hundreds of America's highly geared war plants, you'll find P&H Zip-Lifts handling materials beside machine tools, along production lines, in warehouses, loading zones, etc. They're saving time, manpower — helping get America there *first with the most!*



CAPACITIES
 250, 500, 1,000 and
 2,000 lbs.

IT'S a small, wire rope electric hoist with full magnetic push button control; with lifting capacities of 250, 500, 1,000 and 2,000 pounds. Bolt, hook or trolley mountings are interchangeable. To aid the war effort, qualified defense plants can depend upon P&H's honest delivery dates.



General Offices: 4411 West National Avenue, Milwaukee, Wisconsin

HARNISCHFEGER
 CORPORATION

HOISTS • WELDING ELECTRODES • MOTORS



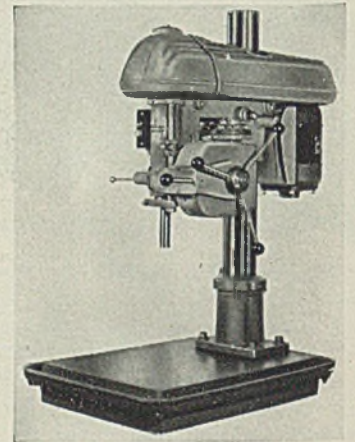
EXCAVATORS • ELECTRIC CRANES • ARC WELDERS

are centralized. A separate coolant tank mounted on casters makes it easy to remove the chips and sediment in the coolant tank.

Drill Presses

Walker-Turner Co. Inc., Plainfield, N. J., has introduced new single and multi-spindle drill presses in the 1100 series designed to meet present production demands. The multiple spindle models—two to six spindles—are particularly effective in increasing production on jobs where a series of holes are to be drilled, reamed or counterbored in a single piece.

The power feed unit—one that will permit one operator to operate effectively four or more spindles—is operated through a multiple disk clutch and has constant mesh worm gear and worm. A power take-off pulley on the drill press spindle operates the unit through a 4-speed counter shaft. This makes available feed rates of 0.003, 0.006, 0.009



and 0.012-inch per revolution of the spindle.

Feed rates on the machine are quickly changed, a tension release on the counter shaft belt simplifies making the change. The clutch can be engaged at a touch of a lever at any point of spindle travel, there are no gears to mesh. Also a micrometric depth gage releases the feed at any predetermined point and allows the spindle to return to its original position.

Capacity of these drill presses in steel is ¾-inch and 1-inch in cast iron. Distance from spindle to column is 10 inches permitting drilling to the center of a 20-inch circle. They have five spindle speeds from 260 to 1740 revolutions per minute with an 1140 revolution per minute motor or from 400 to 2600 with a 1740 revolutions per minute motor. Balanced pulleys and rugged construction throughout permit spindle speeds in excess of 5000 revolutions per minute.

Rack and pinion elevating mechanism can be used on heads of the multi-

For increased production

from your Plate Mills—

"Techni" PROCESS ALLOY IRON ROLLS



- ... they are non-spalling
- ... give improved surface finish
- ... have soft and strong necks and wabblers

*The Rolls with the Red Wabblers
They Roll More Tons Per Roll Grind*

Mackintosh-Hemphill Nironite rolls are high nickel alloy iron, of the grain or indefinite chill type. The body surface structure very closely approaches that of the true chill rolls. Body centers and necks are soft and strong.

"Techni" Process was developed exclusively by Mackintosh-Hemphill. It regulates the quality and grain size of the rolls with as much exactness as the best modern steel practice regulates the quality of steel. Give your plate mills the very best in roll quality . . . specify "Techni" Process alloy iron rolls.



OTHER MACKINTOSH-HEMPHILL PRODUCTS: Rolling Machinery . . . Shape Straighteners . . . Strip Coilers . . . Shears . . . Levellers . . . Pinions . . . Special Equipment . . . Iron-Steel Castings . . . The NEW Abramsen Straightener . . . Improved Johnston Patented Corrugated Cinder Pots and Supports . . . Heavy Duty Engine Lathes.

Since 1803—Pioneers, Engineers and Builders
MACKINTOSH-HEMPHILL COMPANY . . . Pittsburgh and Midland, Pa.



Get the Most Out of Every Wheel

On Your Portable Grinders

Of course the first thing is to make sure you have the right grain and grade of Norton Wheels for the types of grinding you are doing. But even when this has been done, improper handling can waste many grinding wheels.

Set the grinder down carefully each time—where it can't fall against anything. A cracked wheel may fly apart.

When you change wheels for a different size or shape don't loosen the one on the machine by banging it. Use a wrench or vise.

Keep the wheel free cutting and in balance by truing when necessary. If the speed is too slow the wheels are apt to get out of round and out of balance.

Use just enough pressure to keep the wheel cutting at its best rate and still not slow down or stall the grinder.

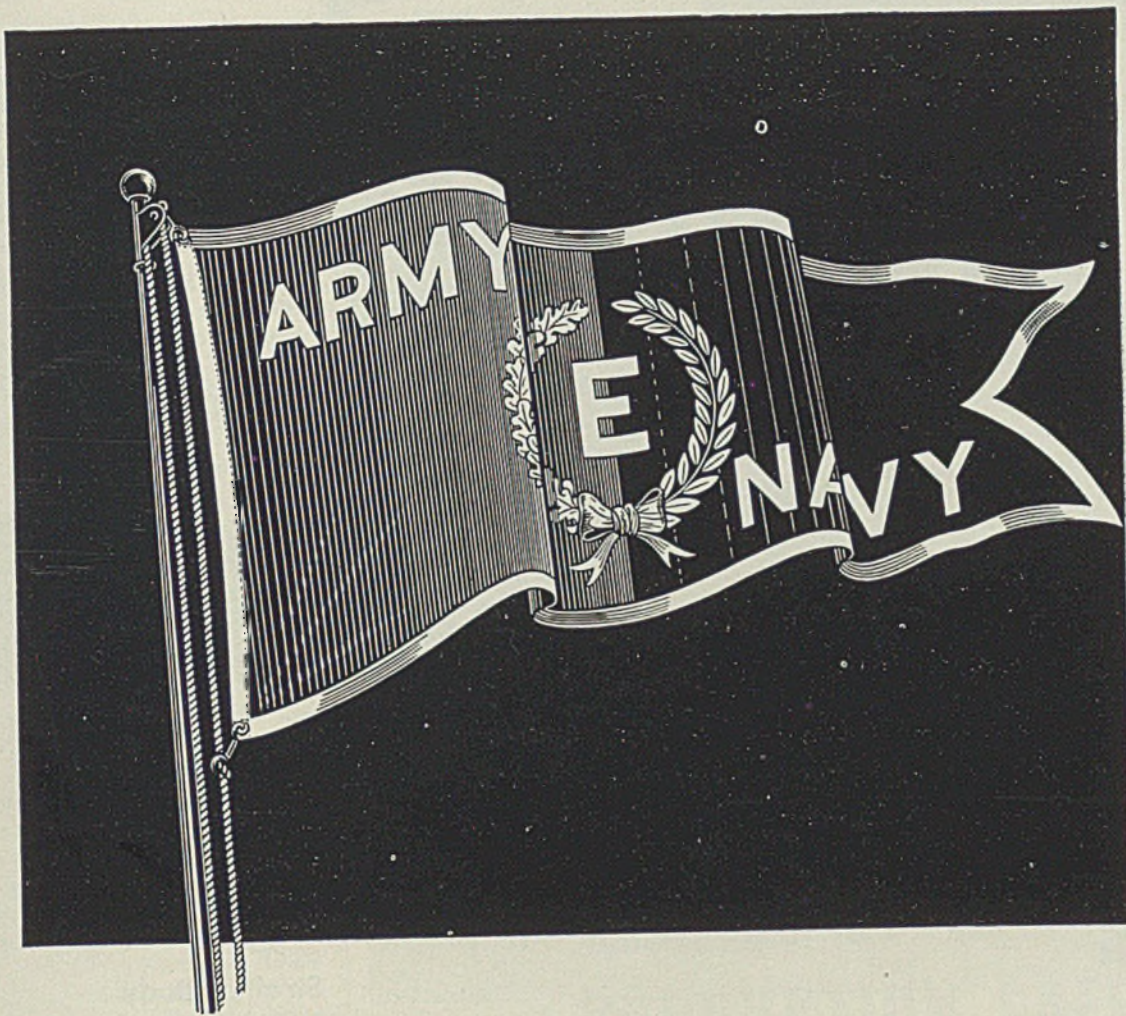
Don't hesitate to call in a Norton abrasive engineer. He'll be glad to study your grinding jobs and make sure you are using the most suitable wheels.

NORTON COMPANY, WORCESTER, MASS.
Distributors in All Principal Cities

W-886



NORTON ABRASIVES



STANDARD *Awarded Army-Navy E*

For high achievement in the production of war materials the War & Navy Departments have awarded to Standard this symbol of outstanding contribution to the war effort and to the future of America.

This recognition of exceptional performance on the production front, shared in by every Standard worker, is also indicative of the spirit with which, since its early beginnings in the Freedom Forge of 1795, Standard has served America and the

railroads which helped to build America.

On behalf of its personnel, Standard accepts the Army-Navy E with pride.

**STANDARD
STEEL WORKS**



DIVISION OF
THE BALDWIN LOCOMOTIVE WORKS
PHILADELPHIA

FLEXPEDITE

Your

★ **Conversion**
★ **Assembly**
★ **Production**

with

REX Flexible METAL HOSE

In REX Flexible Metal Hose you have an immediate solution for your re-design problems where compactness and flexibility are imperative. Plus this, you conserve materials because REX Flexible Continuous Lengths Metal Hose eliminates the need for long lengths of piping and pipe joints. It enables engineers to simplify designs—provides the means for solving fluid and gas handling problems—speeds manufacture by facilitating assembly. There are easily attached fittings for every requirement. REX Flexible Metal Hose withstands flexing and vibration and assures better product performance.

Utilize this range of adaptability—write for data and engineering recommendations on specific problems involving flexible connections.

REX-WELD Corrugated Flexible Metal Hose.
REX-TUBE Interlocked Flexible Metal Hose.
REX-FLEX Stainless Steel Flexible Tubing. AVIO-FLEX Oil Line Hose. CELLU-LINED Hydraulic Hose.



COPYRIGHT, 1942, CHICAGO METAL HOSE CORPORATION, MAYWOOD, ILLINOIS

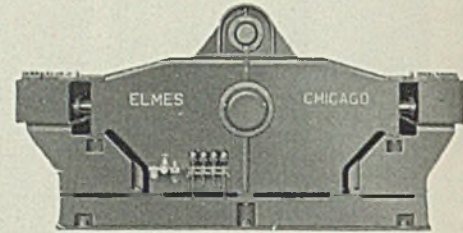
CHICAGO METAL HOSE CORPORATION

General Offices: MAYWOOD, ILLINOIS
Factories: Maywood and Elgin, Ill.

spindle models or on the table of floor model machines. Pulley and spindle bearings as well as all moving parts of the quill and feed mechanism are lubricated from a single oil hole located above the spindle.

Hydraulic Pump

Charles F. Elmes Engineering Works, 243 North Morgan street, Chicago, announces a 6-plunger, fully enclosed, horizontal hydraulic pump as an addition to its line. Modern in appearance it embodies the latest principles of de-

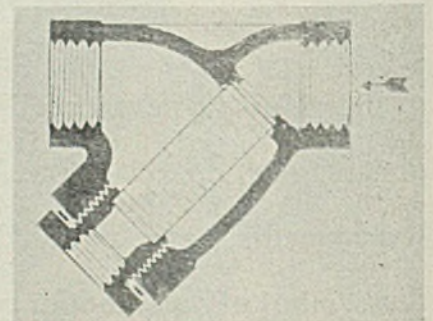


sign and construction. All moving parts are pressure lubricated and connecting rods run in a continuous bath of oil. Maximum capacity of the pump is 400 horsepower. Herringbone gears are used for driving the pump which is particularly adaptable for accumulator systems. It can be equipped with built-in by-pass valves or safety valves.

Strainer Body

Yarnall-Waring Co., Chestnut Hill, Philadelphia, announces an improved Yarway fine-screen metal strainer body which in iron is suitable for pressures up to 250 pounds and steel up to 600.

Offered in six standard sizes, 1/2 to 2



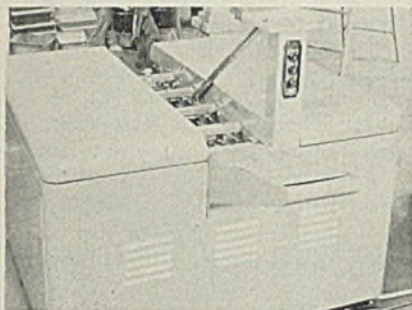
inches, it has three improved features: Plating inside and outside for protection against rusting; screen of special Monel woven wire fine enough for straining service but having ample free area; and straight thread and machined face on blow-off brushing for easy removal and replacement of screen and for tight joint.

Automatic Machine

Watcher Design Co., 2419 Bremont avenue, Cincinnati, announces an automatic machine for making bodies of brass percussion primers which are

threaded in both ends. It is adaptable to the several lengths up to 10 inches and to other products which can be moved and re-chucked for various operations by any number of spindles.

Cut-to-length tubing is fed into a hopper at the front of the machine and the finished part rolls out the back. The work carriage has extra open stations which allow rapid removal of any piece

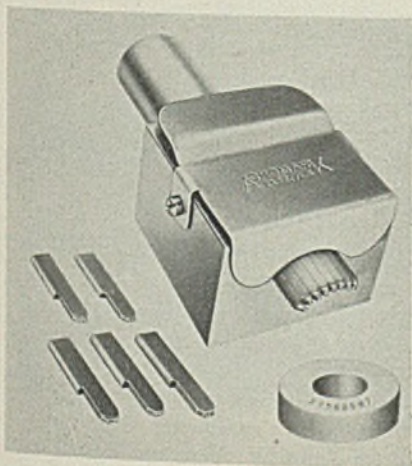


after any operation. Electric gages check whether the plug is inserted or screwed in far enough and stop the machine if not, so the piece can be reclaimed and re-run and thus not spun over and ruined.

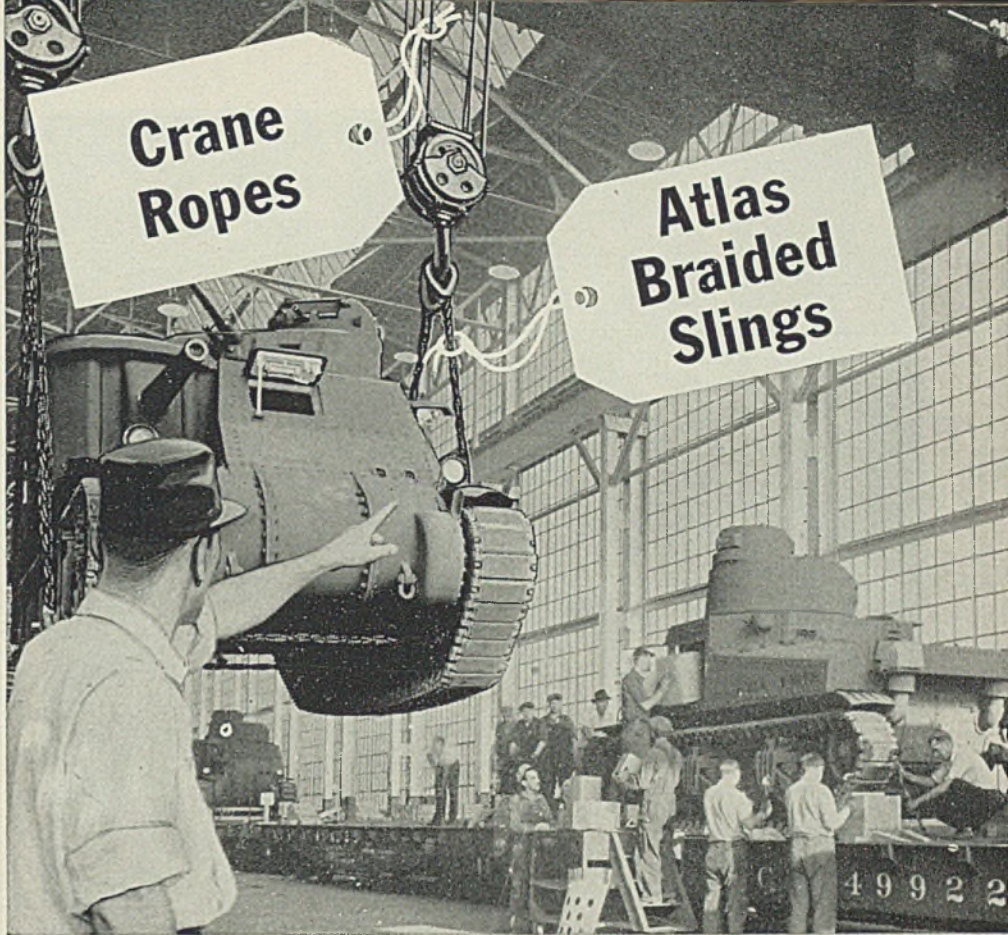
Several relief and safety devices, including a general system which contacts and protects the work throughout its traverse and applies a motor brake for an instant stop are incorporated. Chips and oil are blown from the tube before the plug is screwed in. The six spindles and spindle pulleys of the unit including the automatic screwdriver attachment, run on ball bearings and are driven by individual motors and V-belts. Tools have fine adjustment and individual cams which graduate the feed to the metal removal rate or to the lead for threading.

Curved Line Holder

Acromark Corp., Elizabeth, N. J., is offering a new type holder for marking metal ordnance parts. A heavy-duty



stamping tool, it consists of a one piece shock resisting alloy tool steel, furnished



TEAMED UP TO SPEED PRODUCTION SAFELY!

On the production front, and on the fighting front, it takes teamwork to win the battle. Macwhyte has been working 7 days a week producing a "team" that's speeding production of war materials in every part of America.

This combination of Macwhyte Atlas Slings and Macwhyte Crane Ropes is moving pipes, tanks, rolls, guns, machines...the list is almost endless...with speed and safety.

These two team up so well because...

Macwhyte Atlas Braided Slings...

- Are made from both left-&-right lay endless wire ropes
- Have perfect balance which eliminates spinning
- Are extremely flexible, easy to handle
- Have the positive safety of endless wire ropes

Macwhyte PREformed Crane Ropes...

- Are made from selected steels of unusual strength
- Are PREformed to assure l-o-n-g life
- Are specially lubricated to protect against friction and corrosion
- Have high fatigue resistance

Macwhyte Crane Ropes and Slings can help YOU "keep 'em rolling" faster with safety, too. 1. Write on your company letterhead for helpful rigging bulletins. 2. For your rope needs, tell us the make, model, and capacity of your crane—size, grade and construction of rope now used—preference rating, use, and approximate diameter you will be needing the rope. 3. For your sling needs, send sketch with details of size and weight of loads to be handled and method of attachment.

CRANE ROPES to hoist the load . . .

BRAIDED SLINGS to harness it safely. BUY BOTH FROM

MACWHYTE COMPANY

2912 Fourteenth Avenue, Kenosha, Wisconsin—Manufacturers of wire rope to meet every need—Left-&-Right Lay Braided Slings—Stainless Steel Wire Rope—Monel Metal Wire Rope—Aircraft Cable, Aircraft Tie-Rods, "Safe-Lock" Swaged Terminal



An Anker-Holth shipment made the day the order was entered.

Final inspection of Anker-Holth air cylinders.

So writes a production official of one of America's foremost electrical manufacturers. His problem was economical and immediate mass production of parts for large war contracts.

Anker-Holth filled his needs by *prompt shipment* of high speed revolving air cylinders.

Wire, or phone, your air cylinder and air operated chucking device requirements to Anker-Holth. You will find deliveries exceptionally prompt.

Write for Bulletin!

Anker-Holth Mfg. Co.

"AIRGRIP" CHUCK DIVISION

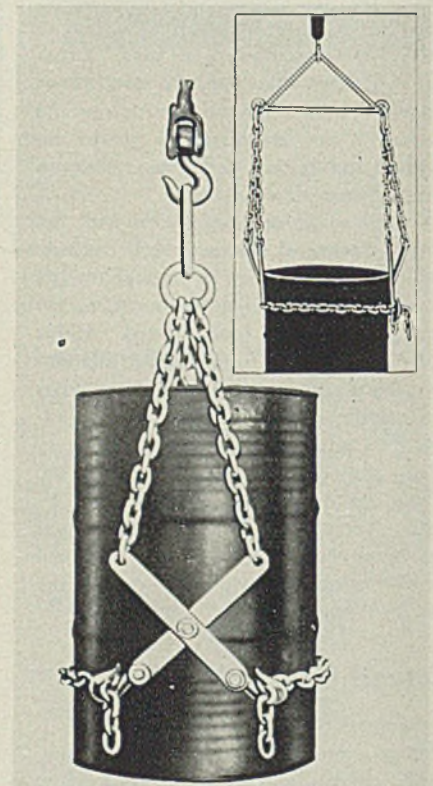
332 So. MICHIGAN AVE · CHICAGO, ILL.

either with a press shank or hand style to fit the hand for striking with a hammer.

A steel clip holds the interchangeable type in place and by simple quick thumb pressure permits changing of type. Each piece of type is of segment shape and has the Hercules heavy shoulder feature to give increased strength. All characters are engraved in an open and clear gothic style with a strong bevel and are tapered to face.

Barrel Grab

Palmer-Shile Co., 7118 West Jefferson avenue, Detroit, announces a new barrel grab for picking up any type of steel or wood barrel, box or container, from 40 inches in diameter down to small nail-keg size. It will lift up to 2000 pounds.



The grab is toggle constructed of $\frac{1}{2}$ x 2 inches flat-bar stock and pivoting pin of 1-inch cold-rolled steel with retainer head. The chain is $\frac{3}{8}$ -inch while the spacer and hoisting bar is of $\frac{3}{4}$ -inch diameter cold-rolled steel bar.

Limit Switch

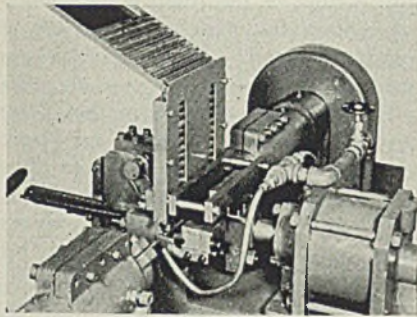
General Electric Co., Schenectady, N. Y., announces a new lightweight limit switch for aircraft applications. It meets all United States Army Air Force stipulations.

Contact mechanism used in the switch is the company's switchette. Snap action and double-break operation is said to give it a high current rating. Plunger of the unit operates with a $\frac{7}{32}$ -inch over-travel. Its aluminum housing is dust-

proof and adequate space is allowed inside the housing for easy wiring. The switch is available in three contact arrangements: Single-circuit, normally open or normally closed; and single-pole, double-throw. Each form can be furnished with a contact air gap of 0.010, 0.020 or 0.030-inch. The switch weighs 0.13-pound.

Automatic Chute Feed

Pines Engineering Co. Inc., Aurora, Ill., announces an automatic chute feed to the air chuck used on its 2-spindle profiling machine. It is for feeding such items as brass and copper primer tubes

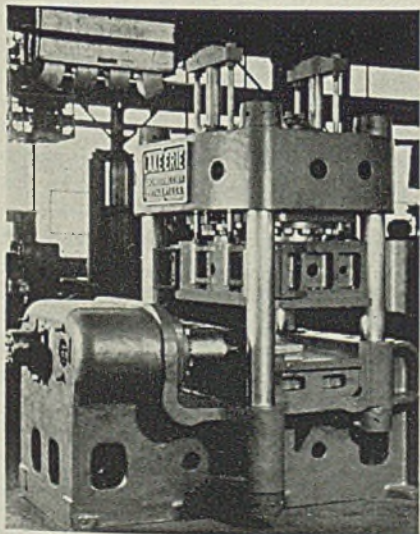


for boring and tapping operations on both ends at the same time. According to the manufacturer, production from these machines is increased as much as 30 per cent with this feed.

Hydraulic Press

Lake Erie Engineering Corp., Buffalo, has introduced a 450-ton angle-type hydraulic press for molding phenolic plastics. It is manufactured complete and ready for connection to an accumulator pressure system.

Platen of the press measures 24 x 50 inches. Its vertical stroke is 12 inches



and horizontal stroke is 10 inches. Main bed is of rugged design and cast in one piece to maintain correct vertical and horizontal alignment.

ROEBLING *Wires*

ROUND... FLAT... SHAPED

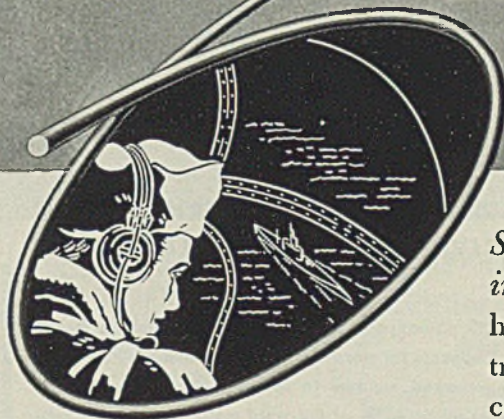


FLAT WIRE TO SPECIFICATION

SHAPED WIRES

ROUND WIRE FOR AIRCRAFT CONTROL CORDS

A FEW WIRES TYPICAL OF ROEBLING'S BROAD SPECIALTY PRODUCTION



Sinking sub after sighting same calls for a steady hand plus unfailing control cords. Wire for these control cords must be

made to extremely rigid specifications of steel analysis, tensile strength, ductility and dimensional accuracy. And with each step up in speed and tactical requirements, "specs" get tougher!

But, Roebling is an old hand at this kind of work... and has a backlog of experience making round, flat and shaped wires for hundreds of other war-born products.

With special steel-making facilities... man-power trained along custom production lines... we're ready and able to solve your tough specification problems, the way you want them solved.



JOHN A. ROEBLING'S SONS COMPANY

TRENTON, NEW JERSEY • Branches and Warehouses in Principal Cities

Western Iron Industry

(Continued from Page 84)

the presence of a labor supply. Other factors often enter in, and there is always some combination of factors determining the regions of concentration in an industry. The nature of the manufacturing processes and products dictates the relative weight of the different factors.

Modern blast furnace location is determined primarily by the assembly cost of the raw materials, but nearness to the market for steel products must be

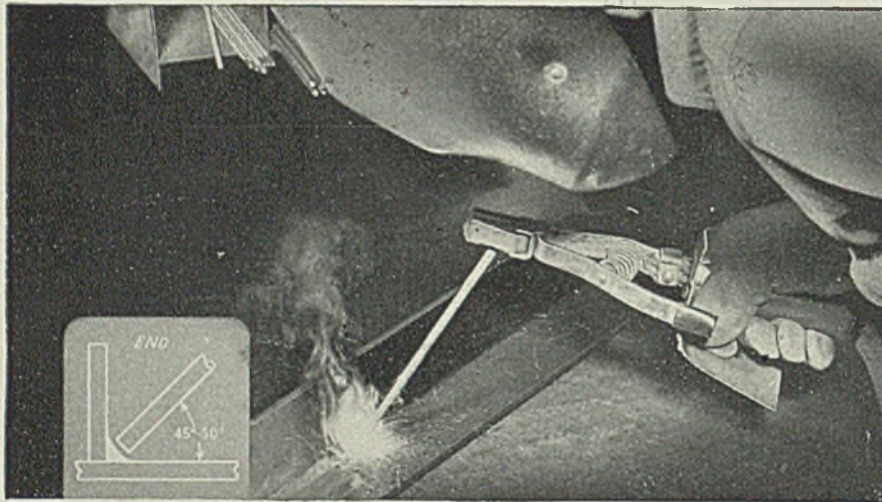
considered. A plentiful supply of water is required mainly for cooling and condensing purposes to the extent of about 30 tons per ton of steel produced, but most of this water is not consumed and may be reused after cooling.

"In the making of most steel products, the location of blast furnace plants requires an adjacent location of steel-works and rolling mills because efficiency demands that most tonnage steel, e.g., rails, structural shapes, sheets, etc., be produced by integrated operations in order to avoid heat losses between processes and the unnecessary cost of ship-

ping heavy semifinished material. Even though a substantial percentage of the total steel produced originates from scrap, it is usually more desirable to charge open-hearth furnaces with both scrap and molten pig iron. Blast furnace assembly costs, therefore, basically determine the location not only of blast furnaces but also the location of the country's major steel furnaces and rolling mills."

Table I has been compiled from a number of sources and while it is impossible to represent all the factors accurately, yet all of the items have been carefully considered and all available sources of information examined to give this picture of the comparative costs of assembling the basic raw materials of pig iron making.² Adjustments have been made for different grades of ore, coke yield of coals and needs of flux. There are variations in operating conditions, and the results given are believed to be an approximation to typical conditions in each district. For the other regions there have been studies and reports but for Utah the material has, in the main, not heretofore reached beyond private investigations or official or semi-official studies that have not been made available to the public.

Figures in Table I on the material and assembly costs necessary for 1 ton of pig iron have been worked over carefully to put them on a fair basis for comparison among the various district. Adjustments have been made for the differences in the iron content of the ore and the amount of coke required to produce a ton of pig iron. In all cases the iron content of the pig iron has been assumed to be correct, but it affords a fair basis of comparison. In the case of Birmingham it takes more than a ton of coke because of the lower iron content of the ore charged to the furnace. The figure used was 1900 pounds for both Gary and Pittsburgh and 1800 pounds for Utah. The fact that the Utah furnaces will be among the largest and most modern should cut the coke consumption to somewhere near the 1700 figure that is currently understood to be the amount required under the Utah situation. It is a coincidence that the final cost of the materials per ton of pig iron as given is exactly the same for Gary and for Pittsburgh. The higher cost of iron ore at Pittsburgh, because of the added rail rate from Lake Erie to Pittsburgh, is exactly offset by the higher freight cost that Gary has in bringing coal for the coke.



how a ten-year-old technique



ASSUMES NEW IMPORTANCE IN THE DRIVE TO CONSERVE ELECTRODES

THIS photograph shows a method taught by Murex Engineers for more than ten years and used by many experienced welders to speed fillet welding. It also saves up to 40% of the weld metal, produces a substantially stronger weld and at the same time helps to conserve precious welding electrodes.

First: The electrode is held at an angle of from 45° to 50° to the horizontal plate and leaning in the direction of welding to form an angle of about 20° with the vertical.

Second: In multiple pass work, beads are laid from the bottom upward—not from the top downward.

Third: Cleaning time can be saved by leaving on the slag until each layer of beads is completed.

Fourth: Select a rod which permits the use of high current and use the largest size electrode that is practical.

METAL & THERMIT CORPORATION
120 BROADWAY
NEW YORK, N. Y.

Specialists in welding for nearly 40 years. Manufacturers of Murex Electrodes for arc welding and of Thermit for repair and fabrication of heavy parts.



ALBANY • CHICAGO • PITTSBURGH • SO. SAN FRANCISCO • TORONTO

MUREX

ARC WELDING ELECTRODES

¹"Pittsburgh Business Review," Vol. VIII, No. 1, Jan. 1938.

²See especially *Economics of the Iron and Steel Industry* by Daugherty, DeChazeau and Stratton, McGraw Hill Book Co., New York; and the "Pittsburgh Business Review," Vol. VIII, No. 1 and No. 7.

The value of the coke was taken from the *Minerals Yearbook* for Birmingham, Gary and Pittsburgh which would be probably somewhat higher than it would be available to the companies actually in business of producing it themselves.

In the case of Utah the coal was figured at \$1.50 per ton at the mine with the same cost of assembly, and the figure given for the value of coke was merely an addition of these two figures. But this would be modified by the cost of coking the coal and allowance for important by-products which should be credited against these figures. Since the amount of these by-products is substantially higher for Utah where 47 per cent loss is figured for coal in the coking process against only 30 per cent for the other regions, the credits should be important, but for conservative figuring no credit was added.

When these factors are all taken together it can be seen that the cost of the materials together with their cost of assembly for Utah and Birmingham are close together, and there are enough elements in the situation to indicate the probability that Utah may be the place in the United States where pig iron can be produced most economically. It is evident that this district does not start out with a handicap in this regard but has a rather distinct advantage over both Gary and Pittsburgh. In fact, the advantage is almost equal to the cost of transporting the pig iron and the steel products from Utah to the Pacific Coast, so that this western industry based on Utah has a solid economic foundation for being essentially independent of eastern iron and steel production.

As far as raw materials are concerned, Utah has a favorable situation in the high quality of the cheaply mined iron ore, low taxes on the iron ore property and reasonable freight rates from the iron ore mines to the blast furnaces, as shown in Table II. Added to this will be the cheap cost of mining the coal. The flux is also cheap to mine and the assembly cost is low.

Offsetting Birmingham's low cost of assembly must be placed several factors of significance. In the first place, the more expensive underground mining of the iron ore is a matter of considerable importance. The same thing may be said of the mining of the coal where the existence of thin seams coupled with the necessity of washing the coal and the pumping of large volumes of water, partly offset the cheap cost of assembly. There must also be added other disadvantages arising from the lower quality of iron ore. This requires handling greater tonnages for a given production of pig iron, necessitating more coke for smelting and a reduction in the capacity

of the blast furnace, thereby adding to the capital, fuel and labor costs.

For the Pittsburgh region the advantage in cheap cost of assembling the coal is offset, in comparison with Utah, by the higher cost of the iron ore made up mainly of higher freight rates and higher taxes on the mining property from which the ore is taken. The quality of the ore is some little higher for Utah than for Pittsburgh. The assembly cost for iron ore is less for Chicago than it is for Pittsburgh, but it is still greater than it is for Utah. Chicago also is at a disadvantage in comparison with Utah be-

cause of the higher cost of assembling the coal for the coke but may have some advantage in the market for the by-products of the coking process.

Utah is strategically located from the point of view of distributing iron and steel products to any part of the Pacific Coast. Direct rail lines radiate in a fan-like manner from Utah points to each of the three population and industrial centers on the Pacific Coast—the Los Angeles area, the San Francisco region and the Pacific Northwest. Steel-making capacity beyond local needs at any one of these three points would re-

"FORBIDDING BARRIERS" WITH EFFICIENT COILING UPWARD ACTION



EXCERPTS FROM A LETTER
BY THE FIRM'S PRESIDENT,
H. W. HARWELL, SHOW
FULL APPROVAL OF KIN-
NEAR ROLLING GRILLE.

"fine appearance"

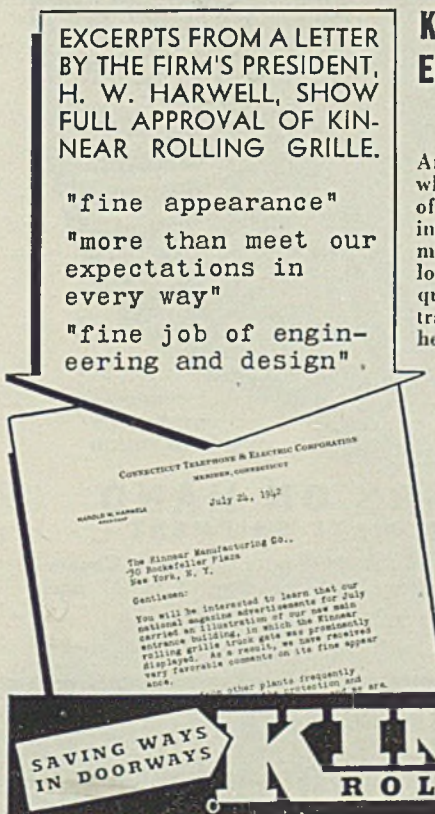
"more than meet our
expectations in
every way"

"fine job of engin-
eering and design"

Kinnear Rolling Grille Guards Entrance at Connecticut Telephone and Electric Corporation

And this well known firm is but one of many who are discovering the remarkable *efficiency* of this formidable barrier—the Kinnear Rolling Grille! Its rugged assembly of strong metal rounds and links defies intrusion when lowered, without cutting off vision; but it quickly coils out of the way above the entrance when opened for "approved" traffic. A heavy tamper-proof, cylinder-type lock affords extra protection where entrances are not under continuous guard. And with motor operation (optional) the Grille can be opened or closed from any number of points, by merely touching a button!

Kinnear Rolling Grilles are also highly desirable as protection for all types of doorways, windows, corridors, stairways and other openings in buildings. They block out intruders when closed, without obstructing light, air circulation, or vision. Built any size. Write for complete details today! The Kinnear Mfg. Co., 1780-1800 Fields Ave., Columbus, Ohio.



SAVING WAYS
IN DOORWAYS

KINNEAR

ROLLING GRILLES

quire a shipment to the others that would be a large part of or in excess of the cost from Utah to either one of the other two points. The fact that it requires 4 to 6 tons of raw materials for 1 ton of finished product and the plentiful supplies of these in close proximity to each other in Utah are compelling reasons for the location of pig iron and basic steel production in Utah to supply the Pacific Coast region.

Under present conditions the bulk of steel consumption in the West is located along the Pacific Coast, and so, from the immediate point of view, the problem

involved is that of the transportation from other steel producing centers to the Pacific Coast as compared with the Utah location. The principal points from which comparison should be made are: Pueblo, Colo., Birmingham, Ala., Sparrows Point, Md., Pittsburgh and Chicago.

Table III gives the comparative car-load freight rates to the Pacific Coast ports. These are all-rail freight rates and for comparative purposes the water rates from Atlantic Coast ports are included. These water rates are, however, not significant now and have not

been for several months, since traffic of this type has ceased because of the necessity of using ships for other needed war purposes. This condition will continue until the emergency is over but even these all-water rates from plants located on the Eastern Coast are still considerably higher than the all-rail rate from Utah to the same coast points.

On the basis of the steel to be used in shipbuilding alone in 1942, which is close to 2,000,000 tons for the Pacific Coast shipyards, the differential of \$9 to \$15 a ton will amount from \$18,000,000 to \$30,000,000 of excess freight that must be paid above what would be necessary if facilities were available in Utah to meet these needs. This would mean a substantial installment on the cost of the steel plant in the course of construction at Geneva.

With the restoration of peace and the return to the coastwise trade of sufficient vessels to take steel again to the Pacific Coast from the Atlantic and Gulf Coasts this freight differential in favor of Utah would be reduced, but nowhere near eliminated. For those plants located inland that must add to the water rate, a rail rate to the coast, the situation would be change little.

Plant Is Modern

New iron and steel plant at Geneva will be of strictly modern design which will make it the most up-to-date plant in the country, and this will be of considerable significance in the competitive position of the Utah plant. For a long time the chief advantage that Gary and the Chicago plants had over Pittsburgh in the cost of making steel was this factor of more modern equipment, since the assembly costs of the raw materials are greater for Gary and Chicago than for Pittsburgh. But progressively their advantage has disappeared as the Pittsburgh plants have been modernized, and when the two are in the same technological condition Pittsburgh will probably have a slight advantage in the cost of producing pig iron and steel. The advantage Gary and Chicago have in cost of transportation on iron ore is more than offset by the greater cost in bringing the coal to the coking plants. The new Geneva plant will give Utah an initial advantage that will be retained as long as the installations are superior in efficiency to the older plants in other sections.

The exhaustion of the reserve of high-grade iron ore in the Lake Superior region, on which the principal iron and steel mills of the country depend, has been a much talked of possibility for many years. During the long depression of the last decade when the need for iron ore was greatly reduced because the

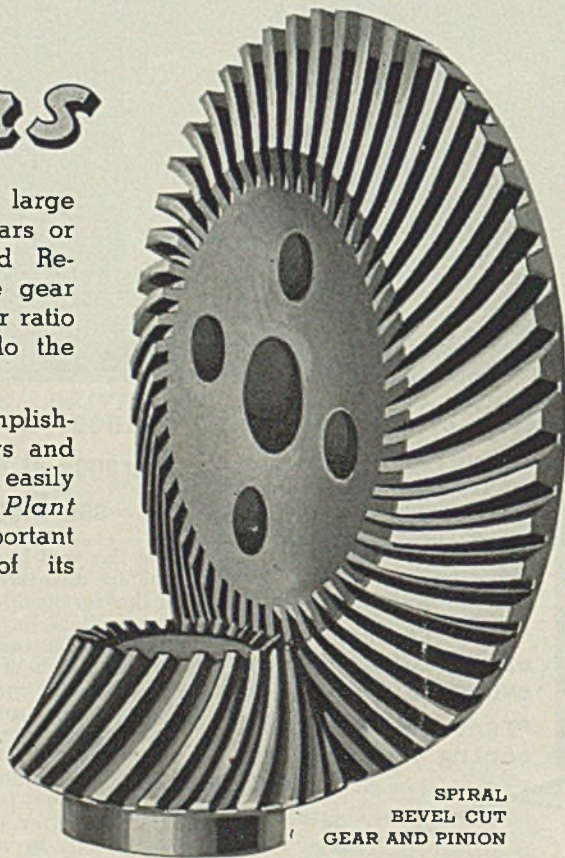
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industry used increasing proportions of scrap to produce a sharply reduced amount of steel products, many people came to think that the depletion of the iron ore reserves was a long way off. But the situation that has developed in the last few years has reversed all this, and in 1942 we will probably draw on these reserves to the extent of approximately 90,000,000 tons which is a heavy draft on a reserve figured at not much greater than a billion and a half tons.

It would seem then to be a matter of basic economic soundness for the economy of the United States to utilize the iron ore resources in other parts of the country in an increased amount and thereby lengthen the life of the Lake Superior deposits. This, coupled with the very definite advantage that Utah has in mining and assembling its raw materials and delivering the steel products to the Pacific Coast at a marked saving over any other producing centers, makes the projected iron and steel development in Utah sound national policy.

The capacity of the open-hearth furnaces for steelmaking in the industry ranges from four installations under 10,000 tons of annual capacity to two installations of more than 3,000,000 tons annual capacity. The greatest concentration in number is between 100,000 and 200,000-ton capacity. There are 17 installations above 1,000,000 tons and 13 installations below that figure. The proposed open-hearth installations in Utah would, therefore, be among the larger ones. These are to be of the latest tilting variety.

The coke plant will also be of a size approaching the larger installations. To produce 1,500,000 tons of coke will require a plant of a size such as there would only be six larger in the United States. Forty-four installations would be smaller.

There will be only seven installations in the United States of nearly equal size or larger than the pig iron plant at Geneva, while 88 will be smaller. If the enlarged plant at Ironton is figured in with the Geneva works then only three in the United States will be larger. These Utah plants are in all cases of sufficient size to insure economical operation.

The plane of living of the people of the western part of the United States compares favorably to that of the country as a whole. On a per capita basis they could be expected to consume iron and steel products at least on a national average basis, but most studies give a higher per capita consumption to the West in most commodities because of the higher average income. The West has 10.5 per cent of the population, 12.5 per cent of the income and 15.6 per cent

of the motor vehicles of the nation.

The three states of California, Oregon, Washington and the territory of Alaska gave employment to 57 per cent of the people employed in the canned fish industry for 1939, while the cost of materials for this western area was 81.9 per cent and the value added by manufacture 83.1 per cent of the national total. In canned and dried fruits and vegetables the eleven Western States and Hawaii accounted for 42.6 per cent of the employment for the United States and approximately the same percentage held for the cost of materials and value

added. It is safe to say, therefore, that approximately 40 to 50 per cent of all of the canning of fruits, vegetables and fish takes place in the western region of the United States, including Hawaii and Alaska. The potential market, therefore, for a western steel plate mill should be somewhere between 500,000 and 1,000,000 tons of tin plate per year for these canning industries alone. At present approximately only 35,000 tons of this amount are produced in the West.

West Coast shipyards account for 35 per cent of the ships being built or under contract in the United States. This rep-

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American Metal Products Company has been producing these and similar items for the automobile, truck and allied industries for the last 24 years. During this period we have grown and expanded to the point where we now occupy nearly 5 acres in an ultra-modern, up-to-date plant.

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resents a great expansion in facilities, and implies greatly increased significance for West Coast shipbuilding. According to the United States Maritime Commission, these West Coast shipyards will require from 130,000 to 140,000 tons of plates and from 25,000 to 30,000 tons of shapes per month during 1942 or a total of between 1,560,000 to 1,680,000 tons of plates and 300,000 to 360,000 tons of shapes for the entire year. At present western processing plants supply little of this.³

³Letter of March 16 from H. L. Vickery, Commissioner U. S. Maritime Commission, Washington.

If it is assumed that 35 per cent of the shipbuilding activity of the United States will be concentrated on the West Coast after the war, which is entirely reasonable, there will be a continuing demand for this type of steel.

Added to the needs of the western part of the United States for steel, we must consider the needs of Western Canada, of Mexico and, on the coming of peace, of nations in the Pacific area. On the basis of markets it would seem then to be logical to expand the steel facilities of the West beyond their present or proposed capacity.

The railroads of the country are normally very heavy consumers of steel, being exceeded only by the automobile and construction industries. The yearly average steel consumption for the last four years for the railroads has been 3,458,700 tons. The western states have 17 per cent of the mileage of the class 1 railroads of the country. While the proportion of traffic would be less than the mileage yet needs for steel by western railroads are large. A significant proportion of these needs are now being supplied by the Pueblo, Colo., steel plant.

Steel Buildings

(Continued from Page 68)

in a building designed in accordance with the principle of continuity the damage would be localized and more easily repaired. Experience abroad indicates that concrete members are more easily injured and are more difficult to repair than are steel members."

The government has decided against construction of air-raid shelters in New York because the modern steel-framed apartment, loft and office buildings are considered as safe a place as any in case of an air raid. That was testified to by Major Myron Barrett, who is associated with the Office of Civilian Defense, in a recent address before the Real Estate board of New York.

Presumably the same holds true of any typical American city because no construction has been found that so successfully protects civilians as does the fully-framed steel building.

The safest place for civilians during a raid would be inside our skyscrapers, on the proper floors. A bomb might penetrate the top five or more stories, the blast caused by a bomb explosion in the street nearby might riddle the lower stories with fragments; but five stories down and three stories above the street would be relatively safe. Fragmentation is the chief danger in congested areas. Thus it is the determination of the Civilian Defense to keep office workers on the middle floors of a building and in the central corridors away from the windows. The skeleton steel frames of the skyscrapers provide the best security. We may be thankful that we have such buildings in our congested city areas.

If we are to draw any lesson from these facts, it seems to me that the most important is this: Again the American skyscraper has proved to be the greatest construction to architectural design since the Renaissance.

The 550-pound bomb has been dropped quite generally in England and in Europe. That size bomb, when exploding, will develop one billion foot-pounds of energy. That being true, it seems



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quite foolish for anyone to suggest that we can economically build to resist bombing. But we do know that certain types of construction are more resistant to the explosions occasioned by bombs. They stand up because a tough material was used in their construction to tie the structure together as a whole.

Engineers usually design to utilize the full strength of any material, with due regard for a factor of safety. Steel has, in addition to its design strength, a reserve of toughness. This toughness is something in addition to the normal strength of the material. On page 86 of this book by Professors Wessman and Rose we find a diagram showing this reserve strength, this toughness of steel. The area of toughness is many times again the area of strength. This is the measure of the toughness which prevents steel from tearing apart under energy loads—even when such energy loads stress the steel well above the elastic limit.

Saving Eyes

(Concluded from Page 65)

their dress glasses. Do not fit your employes with oversize lenses, believing they will give more protection. We found that did not work. Oversize lenses are too heavy and the glasses will not be worn consistently. About half the safety spectacles being supplied to our employes are 24 m/m P3 lenses, and our employes' eyes are protected.

Our workmen now have a much greater respect for their goggles and spectacles because they are carefully and scientifically fitted to them individually. The glasses are clean and sterile when received and are suited to each particular type of work.

Silicon Bronze Alloys

(Continued from Page 76)

silicon bronzes ranks well above that obtained with the gunmetals and similar alloys in which tin is an important constituent. Standard test-pieces cast in green sand give the following average properties:

Ultimate tensile stress, tons per square inch	22
0.1 per cent proof stress, tons per square inch	9
Elongation per cent on 2 inches	20
Brinell hardness (10 millimeter ball, 500 kilograms load)	90

Silicon bronzes may be melted without difficulty in pit fires or tilting furnaces of the coke-, oil- or gas-fired types. Melting should be carried out as quickly as possible, exposure to the furnace atmosphere being kept to a minimum. The melt may be kept well covered

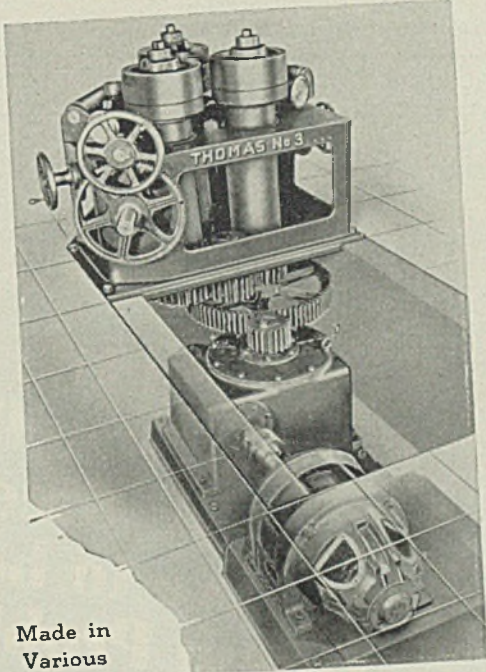
with a gasless flux, such as ordinary bottle glass, cryolite or sal-ammoniac. In cases where the liquid slag is very fluid, a sprinkling of dry silica sand may be used to thicken it so that it may be skimmed readily prior to casting.

Molten metal should not be allowed to remain in the furnace too long after the casting temperature has been attained. Excessive stirring or puddling during melting should be avoided, as this is not only unnecessary but tends to disturb the protecting cover, and may cause gas pockets in castings as a result of contamination of the metal by furnace

gases. The metal should be stirred with a graphite stirrer or a coated iron rod.

Scrap can be added to furnace charges in the usual amounts without detriment to the castings produced. However, great care should be observed that no damp or oily scrap is melted in that condition. The average casting temperature is in the neighborhood of 1130 degrees Cent. (2066 degrees Fahr.), this being modified as required to suit thick or thin sections. The alloy has considerable fluidity, therefore thin sections can be cast successfully.

The characteristic of all silicon



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bronzes is their short freezing range, approximately 50 degrees Cent. (112 degrees Fahr.), and shrinkage therefore takes place at a greater speed than in the gunmetals. This necessitates special attention to the feed requirements, heads and runners of generous size being required.

Various molding methods may be employed for casting silicon bronzes providing the previously mentioned points receive due attention. Where design of the castings is such that adequate feeding metal cannot be introduced, chilling may be restored to with considerable advantage.

Silicon bronzes cast well with the usual types of molding and core making sands, used for other nonferrous alloys as gunmetal, phosphor bronze and manganese bronze, and ordinary facings as lithite and plumbago give good results when used with green sand or dry sand molds. However, care should be taken to ensure ample permeability, as impermeability produces skin porosity.

Silicon bronze castings are clean when removed from either green or dry sand molds, providing an unduly high casting temperature is avoided. Castings removed from the molds while red hot will not scale unduly in the atmosphere.

It is understood that contamination of the tin bronzes, and of gunmetal in particular, by silicon bronzes may occur in mixing machine-shop turnings and borings, etc., and that it is particularly detrimental to the properties of remelted gunmetal. While careful supervision of scrap is the obvious solution to this problem, in the event of accidental admixture occurring, silicon bronzes can be identified from other alloys by a simple test described in the appendix.

Cast Bronzes Weldable

Cast silicon bronzes are readily weldable by the autogenous acetylene or arc methods, and castings containing sand-holes or blow-holes can be salvaged readily by welding these defects. When oxy-acetylene welding, a distinctly oxidizing flame should be employed, rod or wire of the same composition being employed. A suitable flux is composed of 9 parts fused borax and 1 part sodium fluoride.

The previous general data on silicon bronzes refer particularly to P.M.G., marketed by Vickers-Armstrongs Ltd., and Everdur, marketed by I.C.I. (Metals) Ltd. It will be appreciated that, as these two alloys were developed independently, certain differences may arise of their individual properties follow:

The preferred composition of P.M.G. metal within the specification range, and the one to which the alloy is supplied normally is as follows:

Si	3.0 to 4.0 per cent
Fe	1.4 to 2.0 per cent
Mn	1.0 per cent maximum
P	0.1 per cent maximum
Zn	1.5 to 2.5 per cent
Cu	Remainder

Typical mechanical properties are as quoted under the general information for silicon bronzes: The freezing range is 950 to 900 degrees Cent. At the higher temperature the alloy is completely fluid. During melting, a precautionary measure against oxidation is to spread charcoal over the surface of the molten metal. In all melts, a small quantity of phosphor copper, say ¼ pound to 100 pounds, assists deoxidation. Sal-ammoniac is a good flux to use prior to casting.

Segregation of scrap, as mentioned generally for silicon bronzes, is of particular importance in reference to tin and lead contamination, which should be avoided. Iron, manganese and zinc contamination are, however, not detrimental. Repeated remelting can take place with very small melting loss. P.M.G. is particularly suitable for marine engine castings, especially those for which high test pressures are specified. Its corrosion resistance is good for general marine specifications, being superior to gunmetal against sea-water cor-

National Emergency Alternate Steels

DESIGNATION	CHEMICAL COMPOSITION (b)				
	C	Mn	Mo	Ni	Cr
NE 8024	0.22-0.28	1.00-1.30	0.10-0.20	.....	.....
NE 8124	0.22-0.28	1.30-1.60	0.25-0.35	.....	.....
NE 8233	0.30-0.36	1.30-1.60	0.10-0.20	.....	.....
NE 8245	0.42-0.49	1.30-1.60	0.10-0.20	.....	.....
NE 8339	0.35-0.42	1.30-1.60	0.20-0.30	.....	.....
NE 8442	0.38-0.45	1.30-1.60	.....	.....	.....
NE 8447	0.43-0.50	1.30-1.60	.....	.....	.....
NE 8547	0.43-0.50	1.30-1.60	.....	.....	.....
NE 8620	0.18-0.25	1.30-1.60	.....	.....	.....
NE 8630	0.27-0.34	1.30-1.60	.....	.....	.....

Will the Machinability of NE Steels prove to be a Tough Problem?

THE answer will be "Yes" or "No"—depending upon the skill used in handling the change-over.

Changes may be required in tools and tooling; changes in speeds and feeds, and in cutting fluids. When this last factor is considered

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The typical chemical composition of Everdur for sand castings is as follows:

Si	3.0 to 4.0 per cent
Mn	0.5 to 1.5 per cent
Zn	0 to 1.0 per cent
Impurities	0.5 per cent maximum
Cu	Remainder

Typical mechanical properties as cast are as follows:

Ultimate tensile stress	23 tons per square inch
Elongation	18 to 25 per cent on 2 inches
Izod impact strength	30 to 60 foot pounds
Brinell hardness	70 to 95

When annealed for half an hour at 700 degrees Cent. (1292 degrees Fahr.) and slowly cooled, the following properties are observed:

Ultimate tensile stress	22 to 26 tons per square inch
Elongation	22 to 30 per cent on 2 inches
Izod impact strength	40 to 55 foot pounds
Brinell hardness	65 to 90

The freezing range of Everdur is 950 to 1000 degrees Cent. (1742 to 1832 degrees Fahr.) at the latter temperature the alloy is completely fluid. In melting Everdur, it is advantageous to employ oxidizing atmosphere in order to preclude the possibility of gas pick-up, and for this reason a charcoal cover to the melt must be avoided. Everdur is not unduly detrimentally affected by the presence of small amounts of the normal types of impurities.

Lead Increases Machinability

For example, the presence of lead somewhat increases machinability, while aluminum adversely affects the weldability but increases the tensile properties. Amounts of tin up to 1.4 per cent also can be present in this alloy without giving any adverse properties. It will be noted from the typical composition that zinc may be present in moderate amounts as an intentional addition.

Consequently segregation of Everdur scrap from the bronzes and brasses in order to avoid contamination of the former, while desirable, is not essential. However, as has been outlined in the general description of silicon bronzes, gunmetals are affected detrimentally by the presence of silicon.

The ductility, toughness and resistance of the metal to pressure may be improved by a simple annealing for 1½ to 2 hours at 700 degrees Cent. (1292 degrees Fahr.), followed either by quenching or slow cooling. A further advantage of annealing is that casting strains also may be removed. Everdur is an alloy which was developed primarily for use in chemical manufacture, and

as such has been in use for 15 years.

The alloy is superior to copper in resistance to corrosive materials whether solid, liquid or gaseous. It exhibits particularly good resistance to seawater corrosion and marine atmospheres.

The heaviest casting known to have been made in this country in Everdur was a bowl for chemical plant weighing approximately 11 cwts. (1232 pounds). On the other hand small parts made for multiple running are being produced equally successfully for aero-engine parts, a high rate of production being achieved with total rejections as low as ¼ per cent.

Appendix

Rapid Workshop Test For Distinguishing Between Silicon Bronzes And Other Bronzes And Brasses In The Form Of Machine Swarf

The following simple tests have been devised to distinguish between silicon bronzes and certain other alloys, particularly gunmetal.

In the nitroprusside test, two solutions are required: (1) A 5 per cent aqueous sodium nitroprusside solution, and (2) A 5 per cent aqueous hydrogen peroxide solution. Five volumes of 20 vol. hydrogen peroxide diluted to 100 vol. with distilled water.



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QUICK FACTS ABOUT THE PERFORMANCE OF THESE MACHINES

48" x 72" Wheelabrator Tumblast

Only 8 minutes for removing annealing scale and 4 to 5 minutes for rough cleaning are required on average loads weighing from 1,000 to 2,000 lbs. Typical loads are made up of work like the following pieces:

- 12 large tractor wheels about 2' in dia. and 4" thick, weighing 80 lbs. apiece.
- 5 spindles weighing 170 lbs. each, 18" high, 2' in diameter at the base, tapering to a 5" shaft.
- 10 four foot long "L" shaped bars, 8" base, 6" high, weighing about 100 lbs. apiece.

A load of small solid, un-

cored and ungated pieces which make a compact mass will weigh as high as 3,000 to 4,000 lbs.

48" x 48" Wheelabrator Tumblast

This machine is rated at approximately half the capacity of the 48" x 72". It is helping to produce the tremendous tonnage cleaned each month at this plant. The cleaning speed of this machine ranges from 12 to 15 minutes for removing annealing scale and from 8 to 9 minutes for rough finishing.



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Place a small portion of drillings or turnings in a test tube and cover with sodium nitroprusside solution. Hold the end of the tube over a bunsen flame until the solution boils, and maintain for 1 to 2 minutes, remove the test tube from the flame, and after a few seconds decant the solution from the drillings. Wash out the test tube with tap water without removing the drillings and add a small amount of hydrogen peroxide solution.

The surface of silicon bronze drillings immediately turns dark blue in color, while gunmetal is unaffected. This test will also differentiate silicon bronzes

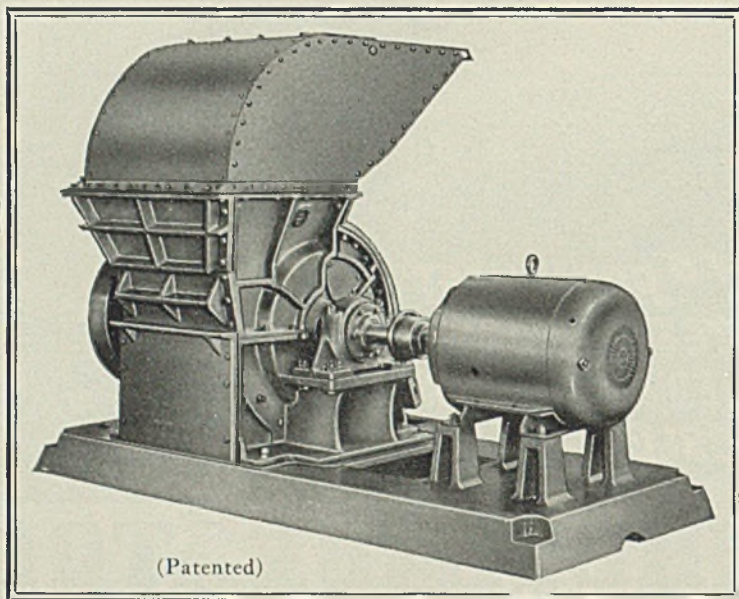
from 95-5 tin bronze, manganese and aluminum bronzes, and the bronzes such as 97-3, 90-10, 70-30, aluminum, Admiralty and high tensile. Copper and cupronickel also give the reaction with sodium nitroprusside, but these are unlikely to be confused with silicon bronzes.

A convenient and simple method of distinguishing between silicon bronzes and certain other alloys is by means of a spot test involving the use of ammonium sulphide solution. With this reagent both silicon bronzes and gunmetal give a black stain when a spot of the solution is applied, but this is not shown

with bronzes containing manganese, aluminum or tin, or the manganese and aluminum bronzes. Copper and 97.3, 90-10, brass give a black stain with ammonium sulphide, and this reagent therefore is used best in eliminating certain classes of material before applying the nitroprusside test.

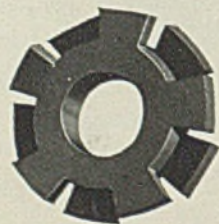
This article is taken from the *Reports on Low-tin and Tin-free Bronzes and Brasses* prepared by members of the Nonferrous Subcommittee of the Technical Committee of the Institute of British Foundrymen, and presented at its thirty-ninth annual conference held in London on June 20. The second part of the report dealing with properties of low-tin gun metals and brasses will appear in a forthcoming issue.

THE EDITORS.



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Utilizing the famous rolling ring principle of crushing, this crusher reduces long curly turnings of low or high carbon steel, alloy steel or brass into "Chips" as the turnings are fed into the feed hopper. Turnings cease to be a bother after you put the proper size American Ring Turnings Crusher on the job; it even pays for itself before you know it. These crushers are not an experiment: they reduce the toughest turnings, and are built to withstand severe requirements. Made in various sizes for various needs. You are invited to take advantage of our free consultation service.



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New Volume Compiled On Powder Metallurgy

Powder Metallurgy, by John Wulff, paper, 662 pages, 6 x 9 inches, 299 illustrations and drawings; published by American Society for Metals, Cleveland, for \$7.50.

The volume comprises some of the papers presented at the 1940 and 1941 conferences on powder metallurgy at Massachusetts Institute of Technology, Cambridge, Mass., annotated and abridged by Prof. Wulff, who arranged the conference. Result is a somewhat heterogeneous collection of brief investigations by researchers in widely separated fields, acknowledged by its editor to suffer because it could not be the "close-knit logical structure sometimes found in text or treatise."

Those interested in the practical applications of powder metallurgy will be disappointed in the book's failure to include any appreciable information on this score. Rather it includes such learned dissertations as "Comminuted Forms of Aluminum," "Determination of the Surface Area and the Average Particle Size of Finely Divided Metals by Use of Low-Temperature Adsorption Isotherms," and "The Coalescence Process for Producing Semi-Fabricated Oxygen-Free Copper."

Fifty-one chapters are presented, about ten of which are concerned with practical uses of metal powders in industry. Bulk of material deals with nonferrous powders, with some half-dozen chapters devoted to various phases of iron powder metallurgy. Concluding chapter is a 54-page patent survey of powder metallurgy by A. W. Deller of New York, covering the art of producing powders, compositions of powders, machines for utilizing various powders and products.

In view of the meager amounts of literature on powder metallurgy which is available, Prof. Wulff has made a start in providing reference material, but his compilation has the shortcomings which might be imagined in an effort to condense a great mass of engineering research on a comparatively new subject into the confines of a single volume.

Ten Ways To Save Critical Materials

By adhering to the following ten principles in insulating a war-plant power distribution system, tons of critical materials, particularly copper, can be saved, according to H. V. Erben, manager, General Electric's central station department.

1. Calculate as accurately as possible what the *actual* load will be and design the system to carry only that load—not on the basis of connected load.
2. Keep to practicable minimum distance over which electric power is to be carried.
3. Transmit power at highest practicable voltages and bring high-voltage distribution as close to the load as possible.
4. Correct for low power factor at a point as close to the reactive load as possible.
5. Use compact, standard equipment. This not only saves copper, time and money, but also makes possible quick replacement in case of trouble.
6. Arrange layouts to limit circuit-breaker interrupting requirements to the optimum values, thus saving copper in buses and breakers.
7. Use 3-phase power transformers wherever feasible.
8. Use forced cooling on power transformers wherever it is practical.
9. Select cables with insulation which will permit maximum load per unit of copper.
10. Limit number of cable per duct bank to the minimum to avoid loss of current-carrying capacity.

Will Electric Power Meet War Demands

Will Electric Power Be a Bottleneck? by Louis Martin; paper, 68 pages, 5¼ x 8 inches; published by the Brookings Institution, Washington, for 50 cents.

Vast increase in demand for electric power will develop as the war production program accelerates and unless this demand can be met the schedule of war production cannot be carried out, no matter how well conceived in other respects.

This analysis was undertaken at the request of the War Department, and the conclusions were made available in April. While the situation already has changed in some respects, it has seemed desirable to present the essentials to give understanding of the seriousness of the power situation. The survey takes account not only of the proposed quantitative increase in production of war supplies, but also of the character of the expansion as it affects power demand.

The author is a French economist and

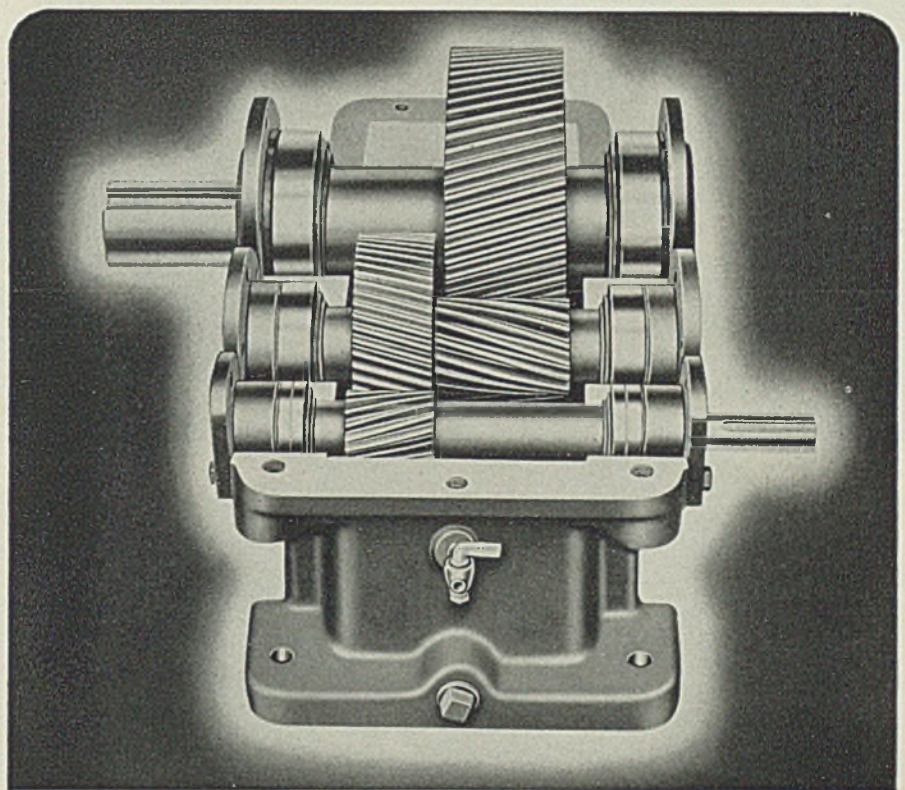
industrialist, a member of the French Academy and author of a number of economic works. Since coming to the United States in 1940 he has devoted his time to studying industrial mobilization problems in this country. Since 1941 he has been a member of the Brookings Institution staff.

The conclusion reached by this study is that the deficiency in electric energy will be considerable, and it will be possible to overcome it only at the cost of immense technical effort and with the collaboration of the government, the various industries and the population.

Lincoln Welding Manual In Seventh Edition

Procedure Handbook of Arc Welding Design and Practice, seventh edition; fabrikoid, 1267 pages, 5¼ x 8¼ inches; published by Lincoln Electric Co., Cleveland, for \$1.50 in the United States, \$2 elsewhere.

First issued in 1933, this handbook has run rapidly through the succeeding six editions in the effort to keep pace with developments in the field. The present issue is designed to keep the designer and welder abreast of progress being made in the use of this process



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in production of essential war products. Application of this means of construction has cut down greatly time required to produce the tremendous quantity of war materials and great advances in its use are being achieved.

In this seventh edition new material is presented on welding symbols, new allowable stresses, preheating for welding, stress relieving, flame cutting, alternating vs. direct current for welding, plug welds, estimating costs, procedures, automatic welding, easy-to-build testing machines, list of cities with welding in building permit, rail end welding and many other are welding applications in manufactur-

ing, construction and maintenance. Latest methods of welding such as the Flat-Fillet technique are included in the text.

Cooling System Increases Transformer Capacities

Increases in power transformer capacities now can be obtained quickly with a new system of forced-oil cooling that saves 25 per cent in critical war materials on new transformers, Allis-Chalmers Mfg. Co., Milwaukee, reports. Called the "Electro-Cooler", it will step up capacity of transformers already in service by

about 20 to 60 per cent, it is said.

The "Electro-Cooler" consists of a radiator-type cooler and a special pump with motor enclosed. These are connected by piping to the standard radiator valves at the side of the transformer.

Because the cooling unit is relatively small, usually more than one is required, the number depending upon the size of the transformer. Greater reliability can be expected from the multiple units, it is stated.

A wartime development designed to save copper and steel, the development is expected to have wide use in post-war applications also. For the current emergency, it not only can be built into new transformers, but can be readily applied to transformers already in service. If the transformers are equipped with the conventional radiator valves, installation can be made in three to four hours.

Offers Sale of Cobalt-Nickel Oxide Compound

Sale of cobalt-nickel oxide compound to ceramic manufacturers, for use in ground coat frits, recently was offered by Ferro Enamel Corp., Cleveland. Produced in its own plant for several years, the compound may be used in the manufacture of ground coat frit for porcelain enamel-ware in the place of cobalt oxide.

The product is refined in a plant Ferro installed in 1940 for refining cobalt oxide so they might control the quality of this ingredient of their ceramic finishes. The plant has an operating capacity of 20,000 pounds of compound per month, plus valuable by-products. R. B. Schaal is superintendent of the plant.

Manual Covers British Machine Shop Practice

Machine Shop Yearbook and Production Engineers' Manual, 1942; cloth, 558 pages, 5½ x 8½ inches; published by Paul Elek Ltd., Africa House, Kingsway, London, W.C.2, for 25 shillings, plus 9 pence postage.

Carrying forward the project for a series of manuals on various divisions of the engineering profession, the first being devoted to steam boilers, this volume on the machine shop will be followed by works on mechanical handling, metal treatment and airplane production.

The plan is to issue these manuals annually to keep pace with late developments in the various branches of engineering and present a digest of established practice and of research and development work of the preceding 12 months.

The present volume in Part I contains special articles on subjects of immediate significance to engineers; Part II containing a descriptive review of established practice and Part III a world digest.

GIVE YOUR PROBLEM TO THOMAS COLD ROLLED STRIP STEEL *SPECIALISTS*



BRIGHT FINISH HOT COATED, HOT TIN COATED, ELECTRO-COATED WITH NICKEL, ZINC, COPPER, BRASS

THE PROPER SOURCE OF INFORMATION BASED UPON EXPERIENCE

The development of new war products involves the selection of materials which will conserve vital metals and also meet specific production requirements. Many manufacturers have placed their problem of new materials in the hands of Thomas Steel specialists. The engineering department in connection with Thomas' experienced operating men put forth a combined effort to present test samples which later may be dependably duplicated on a production basis. As a result of these procedures, Thomas cold rolled strip steel in uncoated and electro-coated finishes has replaced solid brass, copper, zinc, nickel, etc., for many war products. If you have a problem in obtaining a quality of steel to meet your war product requirements, you'll find it worth-while to put it squarely up to The Thomas Steel Company.

THE THOMAS STEEL CO., WARREN, OHIO
SPECIALIZED PRODUCERS OF COLD ROLLED STRIP STEEL

How GM Collects Scrap; 265,000 Tons in 7 Months

(Concluded from Page 38)

plant discovered 1800 tools that had not been called for in the past five years. Excerpts from the report of the salvage department in another plant read:

"Nickel carburizing pots and boxes: This material was being stored in our heat treat building and under ordinary conditions would have been traded in on new material. The management decided that due to the scarcity of nickel this should be scrapped and put into use at once.

"Structural steel scrap: Material made available by scrapping of unnecessary framework and equipment throughout the plant.

"A general work order has been issued for the removing of the screw conveyor, floor plates and channel iron from an old sand blast system in our heat treat department.

"A general work order has been issued for the cleaning up of miscellaneous items in the basement of our heat treat building, such as turntables, steel rails, wire screening, etc.

"We have instructed our foundry to scrap approximately 50,000 pounds of steel flasks and to re-check this storage for additional scrap."

Scrap from Many Sources

Plants making extensive alterations in changing over to war production have scrapped materials unusable in the new production line. Old railroad spurs have been torn up. Unused steam pipes and old wiring have been removed from abandoned tunnels. Advertising departments have been tapped for old electrolytes. Offices have yielded rubber ash trays, paper weights, chair pads, erasers, ornaments, souvenirs and rubber stamps. One division even sent the wooden bases and handles of rubber stamps back to the manufacturer for re-use. Another division which produces automobile headlights in peacetime took its service model lamps apart, placed parts common to those used in war production in stock and scrapped the rest.

In addition to intensive efforts to collect scrap General Motors divisions also are attempting to reclaim and salvage old material to cut down on re-orders.

Worn punches are re-worked to smaller sizes; tools are made over; dies are re-cut and ground; the same grade and grain of wheel is used on a number of grinding operations so that the stubs of large wheels can be redressed for use as small wheels when this is consistent with good operation. Towels, wiping cloths and even waste is now laundered, while

XLO MUSIC WIRE is in constant demand because it has a great variety of uses. Meets all commercial and governmental specifications for high grade steel spring wire. All sizes from .003 to .200. Packages— $\frac{1}{4}$ lb., $\frac{1}{2}$ lb., 1 lb., and 5 lbs.

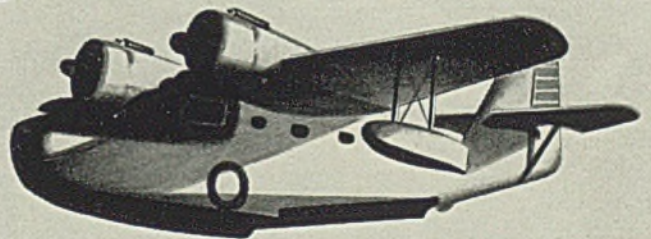
Johnson Steel & Wire Co. has enlisted a heavy production of music wire for the war.



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A NEW TOOL FOR PRODUCTION



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A radically new G-E fluorescent starter—the "Master No Blink"—eliminates flickering of dead lamps and helps to increase war production in three new important ways:

IT SAVES TIME by allowing *instant* dead lamp replacements. That means less maintenance time wasted in war factories.

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IT SAVES MATERIALS by reducing the number of replacement starters. The G-E "Master No Blink" will last longer than any other starter.

Ask us today for full particulars—how it operates and how it saves you money. Just write to Section G921-90, Appliance and Merchandise Department, General Electric Company, Bridgeport, Connecticut.

GENERAL  ELECTRIC

leather and cotton gloves are dry-cleaned. Those that have served their purpose for one use are separated, sterilized and used again in another way. This process is continued until their lubricating value is exhausted. And even that isn't the end, because, if the waste material is suitable, it is finally emptied into the fuel oil tanks and burned as fuel.

One machine gun plant found its grinder sludge contained 95 per cent ferrous metal and obtained permission from the steel mill to ship the sludge with the other scrap. It developed a method of recovering steel, lead and copper alloy from the sand used to stop bullets on the proof firing range and recovered 20,000 pounds of material in the initial operation. It also developed a system for reclaiming and rousing such strategic materials as petroleum benzine. In the case of material still usable, such as conveyors, truck wheels, structural steel, etc., outside firms are asked if they can use such items, before they are scrapped.

Another vital phase of the scrap program involves the segregation of materials so that an alloy of one type is not contaminated by pieces of metal composed of an alloy of another.

One GM division placed a number of containers in each department, each container being painted a different color

and marked for a certain type of scrap. Its efforts also included an educational campaign among the workers. Another division is even segregating sludge so that it can recover the 50 per cent pure chromium contained in the grindings from chrome plated steel tubing.

Scrap Yard Dealers Start Costs Survey

William Pohn, Pohn Iron & Metal Co., Chicago, has been appointed chairman of a special yard dealers' committee by E. C. Barringer, president, Institute of Scrap Iron and Steel Inc., Washington, to start a survey of yard dealers' costs.

Since April 3, 1941, when the first scrap schedule was announced, wages, supplies, taxes, and other factors of preparation costs have advanced greatly, according to Mr. Barringer.

In addition to Mr. Pohn, committee members are: Samuel G. Keywell, Samuel G. Keywell Co. Inc., Detroit; William Behm, United Iron & Metal Co., Pittsburgh; John Robinson, Norfolk Hide & Metal Co., Norfolk, Nebr.; Louis Z. Zalk, Duluth Iron & Metal Co., Duluth, Minn.; Milton Symansky, Symansky Bros., Troy, N. Y.; Harry J. Kiener, Hickman, Williams & Co. Inc., St. Louis; Nathan Jacobs, Buffalo Housewrecking & Salvage Co., Buffalo.

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COMPANY, INC.
BROOKLYN, N. Y.

Approves Mine Wage Raise

(Concluded from Page 36)

were those between jobs in the same plant, between comparable jobs in the same area and between comparable jobs in the same industry.

In the miners' case, the panel said it was necessary to recognize a fourth type of inequality which "might be defined as wage disparities between industries competing for the same limited labor supply which have definitely caused migration of labor from one industry to another of such duration and magnitude as to interfere with vital war production and to present an emergency war problem of national significance."

Stage War Bond Drives

(Concluded from Page 56)

least 10 per cent of their earnings.

Youngstown district of Republic Steel Corp. received the Treasury flag last week for having well over 90 per cent participation.

Continental Screw Co., New Bedford, Mass., has attained 100 per cent participation, to the extent of more than 10 per cent of its total payroll.

Subsidiaries of the United States Steel Corp. are intensifying a drive to enlist employes. Two, Pittsburgh Limestone Corp. and United States Steel Export Corp., already have 100 per cent participation. Others now having 90 per cent or more: Federal Shipbuilding & Dry Dock Co., National Tube Co., Oliver Iron Mining Co., National Mining Co., Michigan Limestone & Chemical Co., United States Steel Corp. of Delaware, H. C. Frick Coke Co., Virginia Bridge Co., United States Coal & Coke Co., Bradley Transportation Co., The Gerrard Co. Inc., and the United Supply Co.

Five plants of the American Car & Foundry Co., New York, are participating more than 90 per cent.

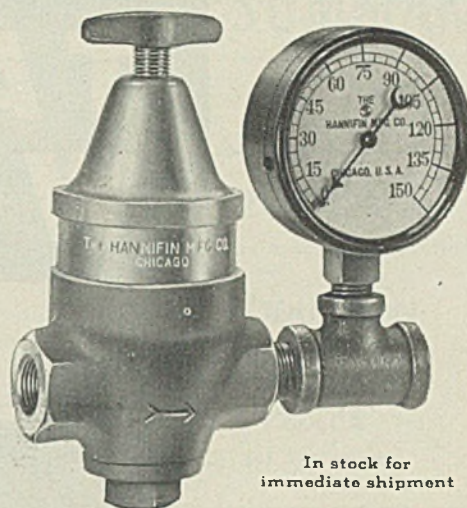
Ninety-six per cent of Allis-Chalmers Mfg. Co., Milwaukee, employes have subscribed.

A four-day campaign in American Brake Shoe & Foundry Co. plants brought subscriptions up to 99 per cent of 9000 workers.

Raritan Copper Works, Perth Amboy, N. J., subsidiary of Anaconda Copper Mining Co., has received the Treasury flag for 100 per cent participation.

An Illinois law which prohibits employers from selling tools or other merchandise not ordinarily handled in the regular course of business to their employes has been held unconstitutional by Attorney General George F. Barrett.

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The exclusive piston type design of Hannifin Pressure Regulating Valves provides large volumetric capacity and sensitive, accurate control of working pressure. Adjustment can be made over the entire working range to deliver any reduced operating pressure desired. Construction is simple, for long dependable life without maintenance.

Three standard sizes— $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ inch, for use on initial pressures up to 150 lbs. Furnished complete with pressure gauge. Write for Bulletin S6-S.

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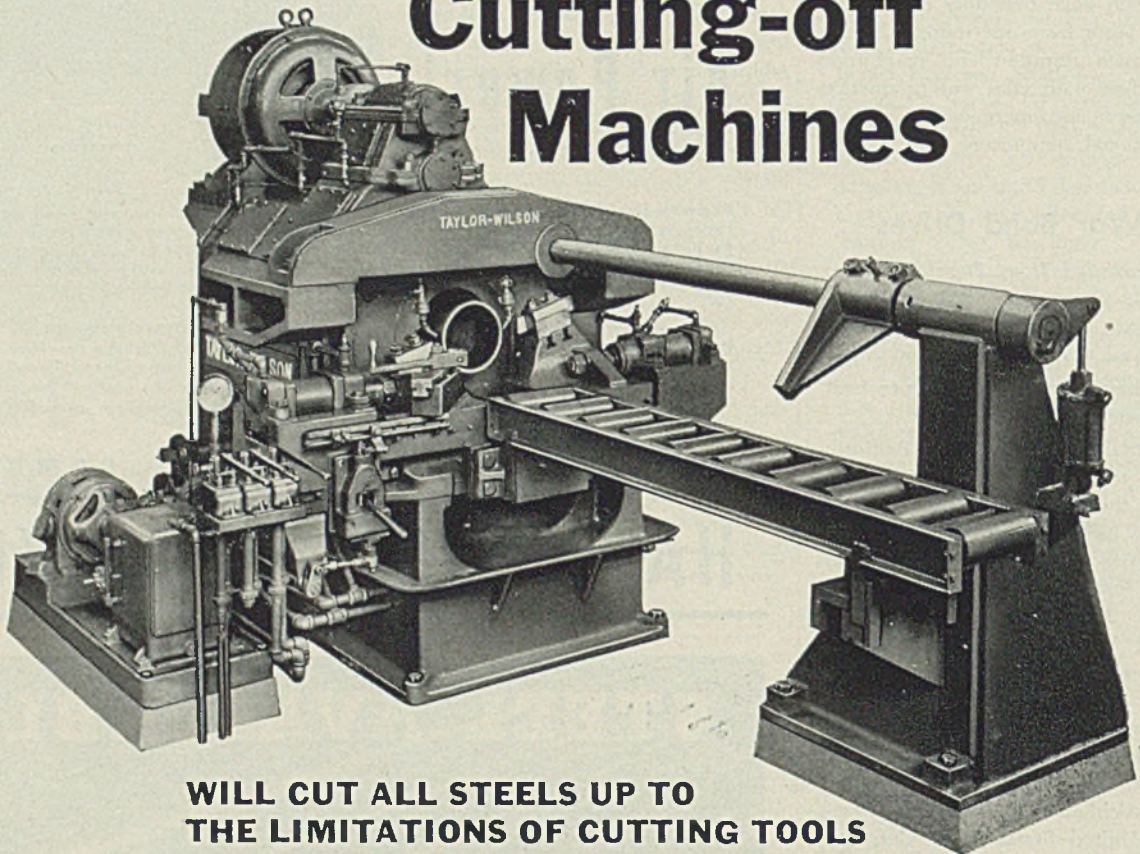
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Cutting-off Machines



**WILL CUT ALL STEELS UP TO
THE LIMITATIONS OF CUTTING TOOLS**

Taylor-Wilson Cutting-Off Machines are aiding the war effort by enabling essential industries throughout the country to step up production beyond normal plant capacity.

They operate smoothly and without vibration even at greatly accelerated speed. And in cutting tubing made of any grade of steel, are restricted only by the limitations of the cutting tools. Simple, one-man control brings added economy.

Especially designed for cutting Bomb Blanks, Roller Bearing Blanks, Coupling Stock and other essential items.

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PITTSBURGH DISTRICT

Delivery Pressure Shifts From Plates to Bars

Large rounds feel heaviest pinch. . . Maximum prices set on rejected steel. . . Scrap tonnage improves under intensified campaigns. . . Pig iron output satisfactory as new stacks come in

EMPHASIS on deliveries is shifting from plates to bars, production of the former having moved up for several months to a point fairly even with demand, while the bar situation has not improved.

As a result some steel is being diverted from plates to other products, including bars. This does not apply to wide sheared plates, for which demand exceeds supply. In bars, deliveries on highest ratings average three to four months, the pinch felt especially in large rounds and in flats. With large requirements for shell rounds expected to come out later in the year the situation promises to become even tighter. Following the success achieved in control of plate production and distribution under the allocation plan a similar system may be expected to be applied to bars.

Supply of National Emergency steels is increasing but deliveries are delayed as badly as was the case in the older alloys. The new steels are winning gradual acceptance as tests prove their adaptability to various uses. A large proportion is said to be going into use without heat treatment, which limits information as to their action under processing.

An allocation system for hot-rolled bars for cold finishers is scheduled to go into effect soon, based on the plan previously announced and later withdrawn, with allocations on a monthly basis.

Ingot production holds steady at the highest practicable rate, necessity for open-hearth repair taking its toll and preventing full capacity operation. Last week it continued unchanged at 98 per cent, gains and losses balancing. Chicago advanced 1 point to 102½ per cent, eastern Pennsylvania 1½ points to 96½, Wheeling 4½ points to 84½ and New England 5 points to 100 per cent. Youngstown was down 2 points to 95 per cent, Cleveland 1½ points to 93, Cincinnati 8 points to 83, St. Louis ½-point to 95 and Detroit 4 points to 89 per cent. Unchanged rates were maintained at Pittsburgh, 95 per cent; Buffalo, 90½ per cent; Birmingham, Ala., 95 per cent.

Efforts to uncover scrap continue in full force and are producing results, supply being better currently than in recent months. A number of tight spots have been relieved and in occasional cases some stocks are being ac-

cumulated, though the latter is the exception. Sources are being probed more deeply and numerous war relics are being contributed. Search for material outside usual channels is being intensified and civic and neighborhood interest is being roused to gather outmoded domestic articles containing metal. Automobile wreckers continue to pour out prepared scrap and in some areas are providing more than the quotas assigned.

As a result of the quota system some cold-rolled sheet producers are unable to book further tonnage, their steel allotment being covered. At the same time others are competing for this class of material to fill out their quota. Sheet demand is not as heavy as in plates, bars and some other products.

Ceiling prices have been set by OPA on rejected flat-rolled and semifinished steel at 65 to 85 per cent of base prices for comparable products of prime quality, plus a percentage of a limited number of trade extras. This is a reduction of 15 to 35 per cent, as previously they could be sold at the same prices as full quality products. The new order is designated amendment No. 7 to revised price schedule No. 6 and is effective Sept. 17.

While some blast furnaces are out of production while being relined the situation in general is good and pig iron output is high. One stack has been taken off in the South, one has been added in the East and two new ones will be blown in about Oct. 1 in New York and Pennsylvania. Foundry melt is being curtailed by inability of melters to obtain war work and pig iron thus saved adds to the tonnage available for steelmaking. Distribution is giving satisfaction to users in general and all iron is going into immediate use for war purposes.

A program is being established to bring tin andterne plate and black plate for tinning under closer control, somewhat similar to that exercised over plates, except that it will set up allocations for the second subsequent month instead of the first, taking into consideration the longer time required for processing coated products.

Composite prices of steel and iron are steady, under definite ceilings of Office of Price Administration. Finished steel composite is \$56.73, semifinished steel \$36.00, steelmaking pig iron \$23.05 and steelmaking scrap \$19.17.

DEMAND

Continues above production

PRODUCTION

Steady at 98 per cent

PRICES

Ceiling set on rejects

COMPOSITE MARKET AVERAGES

	Sept. 19	Sept. 12	Sept. 5	One Month Ago Aug., 1942	Three Months Ago June, 1942	One Year Ago Sept., 1941	Five Years Ago Sept., 1937
Finished Steel	\$56.73	\$56.73	\$56.73	\$56.73	\$56.73	\$56.73	\$62.18
Semifinished Steel	36.00	36.00	36.00	36.00	36.00	36.00	40.00
Steelmaking Pig Iron	23.05	23.05	23.05	23.05	23.05	23.05	22.84
Steelmaking Scrap	19.17	19.17	19.17	19.17	19.17	19.17	19.05

Finished Steel Composite:—Average of industry-wide prices on sheets, strip, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania.

COMPARISON OF PRICES

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

Finished Material	Sept. 19,	Aug.	June	Sept.	Pig Iron	Sept. 19,	Aug.	June	Sept.
	1942,	1942	1942	1941		1942,	1942	1942	1941
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.15c	Bessemer, del. Pittsburgh	\$25.19	\$25.19	\$25.19	\$25.34
Steel bars, Chicago	2.15	2.15	2.15	2.15	Basic, Valley	23.50	23.50	23.50	23.50
Steel bars, Philadelphia	2.49	2.49	2.49	2.47	Basic, eastern, del. Philadelphia	25.39	25.39	25.39	25.34
Shapes, Pittsburgh	2.10	2.10	2.10	2.10	No. 2 fdry., del. Pgh., N.&S. Sides	24.69	24.69	24.69	24.69
Shapes, Philadelphia	2.22	2.22	2.22	2.22	No. 2 foundry, Chicago	24.00	24.00	24.00	24.00
Shapes, Chicago	2.10	2.10	2.10	2.10	Southern No. 2, Birmingham	20.38	20.38	20.38	20.38
Plates, Pittsburgh	2.10	2.10	2.10	2.10	Southern No. 2, del. Cincinnati	24.30	24.30	24.30	24.06
Plates, Philadelphia	2.15	2.15	2.15	2.15	No. 2X, del. Phila. (differ. av.)	26.265	26.265	26.265	26.215
Plates, Chicago	2.10	2.10	2.10	2.10	Malleable, Valley	24.00	24.00	24.00	24.00
Sheets, hot-rolled, Pittsburgh	2.10	2.10	2.10	2.10	Malleable, Chicago	24.00	24.00	24.00	24.00
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.05	Lake Sup., charcoal, del. Chicago	31.54	31.54	31.54	31.34
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50	Gray forge, del. Pittsburgh	24.19	24.19	24.19	24.19
Sheets, hot-rolled, Gary	2.10	2.10	2.10	2.10	Ferromanganese, del. Pittsburgh	140.65	140.65	140.65	125.33
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.05					
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50					
Bright bess., basic wire, Pittsburgh	2.60	2.60	2.60	2.60					
Tin plate, per base box, Pittsburgh	\$5.00	\$5.00	\$5.00	\$5.00					
Wire nails, Pittsburgh	2.55	2.55	2.55	2.55					

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Following are maximum prices established by OPA Schedule No. 6 issued April 16, 1941, revised June 20, 1941 and Feb. 4, 1942. The schedule covers all iron or steel ingots, all semifinished iron or steel products, all finished hot-rolled, cold-rolled iron or steel products and any iron or steel product which is further finished by galvanizing, plating, coating, drawing, extruding, etc., although only principal established basing points for selected products are named specifically. All seconds and off-grade products also are covered. Exceptions applying to individual companies are noted in the table.

Semifinished Steel

Gross ton basis except wire rods, skelp.
Carbon Steel Ingots: F.o.b. mill base, rerolling qual., stand. analysis, \$31.00.
 (Empire Sheet & Tin Plate Co., Mansfield, O., may quote carbon steel ingots at \$33 gross ton, f.o.b. mill.)
Alloy Steel Ingots: Pittsburgh base, uncropped, \$45.00.
Rerolling Billets, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, \$34.00; Detroit, del. \$36.25; Duluth (bil.) \$36.00.
 (Wheeling Steel Corp. allocated 21,000 tons 2" square, base grade rerolling billets under leasehold during first quarter 1942 at \$37, f.o.b. Portsmouth, O.; Andrews Steel Co. may quote carbon steel slabs \$41 gross ton at established basing points.)
Forging Quality Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, \$40.00; Detroit, del. \$42.25; Duluth, \$42.00.
 (Andrews Steel Co. may quote carbon forging billets \$50 gross ton at established basing points.)
Open Hearth Shell Steel: Pittsburgh, Chicago, base 1000 tons one size and section: 3-12 in., \$52.00; 12-18 in., \$54.00; 18 in. and over, \$56.00.
Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, \$54.00.
Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, \$34.00.
 (Empire Sheet & Tin Plate Co., Mansfield, O. may quote carbon steel sheet bars at \$39 gross ton, f.o.b. mill.)
Skelp: Pittsburgh, Chicago, Sparrows Pt., Youngstown, Coatesville, lb., \$1.90.
Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, No. 5—9/32 in., inclusive, per 100 lbs., \$2.00.
 Do., over 9/32—47/64 in., incl., \$2.15. Wor-

cester add \$0.10 Galveston, \$0.27. Pacific Coast \$0.50 on water shipment.

Bars

Hot-Rolled Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, base 20 tons one size, 2.15c; Duluth, base 2.25c; Detroit, del. 2.27c; New York del. 2.51c; Phila. del. 2.49c; Gulf Ports, dock 2.52c, all-rail 2.59c Pac. ports, dock 2.50c; all rail 3.25c. (Phoenix Iron Co., Phoenixville, Pa., may quote 2.35c at established basing points.)
Joslyn Mfg. Co. may quote 2.35c, Chicago base. Calumet Steel Division, Borg Warner Corp., may quote 2.35c, Chicago base, on bars produced on its 8-inch mill.)
Rail Steel Bars: Same prices as for hot-rolled carbon bars except base is 5 tons.
 (Sweet's Steel Co., Williamsport, Pa., may quote rail steel merchant bars 2.33c f.o.b. mill.)
Hot-Rolled Alloy Bars: Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 2.70c Detroit, del. 2.82c.

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.35	5100 Spr. flats	0.15
2100	0.75	5100 80-1.10 Cr.	0.15
2300	1.70	6100 Bars	1.20
2500	2.55	6100 Spr. flats	0.85
3100	0.70	Carb. Van.	0.85
3200	1.35	9200 Spr. flats	0.15
3300	3.80	9200 Spr. rounds,	
3400	3.20	squares	0.40
4100	15-25 Mo. 0.55	T 1300, Mn. mean	
46.00	20-.30 Mo.	1.51-2.00	0.10
1.50-2.00; Ni...	1.20	Do., carbon under	
		0.20 max.	0.35

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lbs., 2.65c; Detroit 2.70.
Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 3.35c; Detroit, del. 3.47c.
Turned, Ground Shafting: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base (not including turning, grinding, polishing extras) 2.65c; Detroit 2.72c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base 2.15c; Detroit del. 2.27c; Gulf ports, dock 2.52c, all-rail 2.61c; Pacific ports, dock 2.80c, all-rail 3.27c.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, base 2.15c; Detroit, del. 2.27c; Gulf ports, dock 2.52c, all-rail 2.61c; Pacific ports, dock 2.80c, all-rail 3.25c.

(Sweet's Steel Co., Williamsport, Pa., may quote rail steel reinforcing bars 2.33c, f.o.b. mill.)

Iron Bars: Single refined, Pitts. 4.40c, double refined 5.40c; Pittsburgh, staybolt, 5.75c; Terre Haute, common, 2.15c.

Sheets, Strip

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Pt., Middletown, base 2.10c; Granite City, base 2.20c; Detroit del. 2.22c; Phila. del. 2.28c; New York del., 2.35c Pacific ports 2.65c.

(Andrews Steel Co. may quote hot-rolled sheets for shipment to Detroit and the Detroit area on the Middletown, O. base.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.05c; Granite City, base 3.15c; Detroit del. 3.17c; New York del. 3.41c; Phila. del. 3.39c; Pacific ports, 3.70c.

Galvanized Sheets, No. 24: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base 3.50c; Granite City, base 3.60c; New York del. 3.74c; Phila. del. 3.68c; Pacific ports 4.05c.

(Andrews Steel Co. may quote galvanized sheets 3.75c at established basing points.)

Corrugated Galv. Sheets: Pittsburgh, Chicago, Gary, Birmingham, 29 gage, per square 3.31c.

Culvert Sheets: Pittsburgh, Chicago, Gary, Birmingham, 16 gage, not corrugated, copper alloy 3.60c; copper iron 3.90c, pure iron 3.95c; zinc-coated, hot-dipped, heat-treated, No. 24, Pittsburgh 4.25c.

Enameling Sheets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 10 gage.

base 2.75c; Granite City, base 2.85c; Pacific ports 3.40c.
Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 20 gage, base 3.35c; Granite City, base 3.45c; Pacific ports 4.00c.
Electrical Sheets, No. 24:

	Pittsburgh	Pacific	Granite
	Base	Ports	City
Field grade	3.20c	3.95c	3.30c
Armature	3.55c	4.30c	3.65c
Electrical	4.05c	4.80c	4.15c
Motor	4.95c	5.70c	5.05c
Dynamo	5.65c	6.40c	5.75c
Transformer			
72	6.15c	6.90c	
65	7.15c	7.90c	
58	7.65c	8.40c	
52	8.45c	9.20c	

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Middletown, base, 1 ton and over, 12 inches wide and less 2.10c; Detroit del. 2.22c; Pacific ports 2.75c. (Joslyn Mfg. Co. may quote 2.30c, Chicago base.)

Cold Rolled Strip: Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less 2.80c; Chicago, base 2.90c; Detroit, del. 2.92c; Worcester base 3.00c.

Commodity C. R. Strip: Pittsburgh, Cleveland, Youngstown, base 3 tons and over, 2.95c; Worcester base 3.35c.

Cold-Finished Spring Steel: Pittsburgh, Cleveland bases, add 20c for Worcester; 26-.50 Carb., 2.80c; .51-.75 Carb., 4.90c; .76-1.00 Carb., 6.15c; over 1.00 Carb., 8.35c.

Tin, Terne Plate

Tin Plate: Pittsburgh, Chicago, Gary, 100-lb. base box, \$5.00; Granite City \$5.10.

Tin Mill Black Plate: Pittsburgh, Chicago, Gary, base 29 gage and lighter, 3.05c; Granite City, 3.15c; Pacific ports, boxed 4.05c.

Long Ternes: Pittsburgh, Chicago, Gary, No. 24 unassorted 3.80c.

Manufacturing Ternes: (Special Coated) Pittsburgh, Chicago, Gary, 100-base box \$4.30; Granite City \$4.40.

Roofing Ternes: Pittsburgh base per package 112 sheets, 20 x 28 in., coating I.C., 8-lb. \$12.00; 15-lb. \$14.00; 20-lb. \$15.00; 25-lb. \$16.00; 30-lb. \$17.25; 40-lb. \$19.50.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, Coatesville, Claymont, 2.10c; New York, del., 2.30-2.55c; Phila., del., 2.15c; St. Louis, 2.34c; Boston, del., 2.42-67c; Pacific ports, 2.65c; Gulf Ports, 2.47c. (Granite City Steel Co. may quote carbon plates 2.35c, f.o.b. mill. Central Iron & Steel Co. may quote plates at 2.20c, f.o.b. basing points.)

Floor Plates: Pittsburgh, Chicago, 3.35c; Gulf ports, 3.72c; Pacific ports, 4.00c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, Coatesville, 3.50c.

Wrought Iron Plates: Pittsburgh, 3.80c.

Shapes

Structural shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.10c; New York, del., 2.28c; Phila., del., 2.22c; Gulf ports, 2.47c; Pacific ports, 2.75c. (Phoenix Iron Co., Phoenixville, Pa. may quote carbon steel shapes at 2.30c at established basing points and 2.50c, Phoenixville, for export.)

Steel Sheet Piling: Pittsburgh, Chicago, Buffalo, 2.40c.

Wire Products, Nails

Wire: Pittsburgh, Chicago, Cleveland, Birmingham (except spring wire) to manufacturers in carloads (add \$2 for Worcester): Bright basic, bessemer wire, 2.60c; Galvanized wire, 2.60c; Spring wire, 3.20c.

Wire Products to be Traded: Standard and cement-coated wire nails, polished and staples, 100-lb. keg, \$2.55

Annealed fence wire, 100 lb., 3.05

Galvanized fence wire, 100 lb., 3.40

Woven fence, 12 1/2 gage and lighter, per base column, 67

Do., 11 gage and heavier, 70

Barbed wire, 80-rod spool, col., 70

Twisted barbless wire, col., 70

Single loop bale ties, col., 59

Fence posts, carloads, col., 69

Cut nails, Pittsburgh, carloads, \$3.95

Pipe, Tubes

Welded Pipe: Base price in carloads to consumers about \$200 per net ton. Base discounts on steel pipe Pittsburgh and Lorain, O.; Gary, Ind. 2 points less on lap weld, 1 point less on butt weld. Pittsburgh base only on wrought iron pipe.

Butt Weld

Steel

Iron

In. Blk. Galv. In. Blk. Galv.

1/2 56 33 1/2 24 33 1/2

3/4 59 40 1/2 30 10

1 63 1/2 51 1-1 1/4 34 16

1 1/2 66 1/2 55 1 1/2 38 18 1/2

1-3 68 1/2 57 1/2 2 37 1/2 18

Lap Weld

In.	Steel			Iron		
	Blk.	Galv.		Blk.	Galv.	
2	61	49 1/2	1 1/4	23	3 1/2	
2 1/2	64	52 1/2	1 1/2	28 1/2	10	
3 1/2	66	54 1/2	2	30 1/2	12	
7-8	65	52 1/2	2 1/2	31 1/2	14 1/2	
9-10	64 1/2	52	4	33 1/2	18	
11-12	63 1/2	51	4 1/2	32 1/2	17	
			9-12	28 1/2	12	

Boiler Tubes: Net base prices per 100 feet, f.o.b. Pittsburgh in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

—Lap Weld—

O. D. Sizes	Seamless—		Steel	Iron
	B.W.G.	Hot Rolled		
1"	13	\$ 7.82	\$ 9.01	
1 1/4"	13	9.26	10.67	
1 1/2"	13	10.23	11.72	\$ 9.72 \$23.71
1 3/4"	13	11.64	13.42	11.06 22.93
2"	13	13.04	15.03	12.38 19.35
2 1/4"	13	14.54	16.76	13.79 21.63
2 1/2"	12	16.01	18.45	15.16
2 3/4"	12	17.54	20.21	16.58 26.57
3"	12	18.59	21.42	17.54 29.00
3 1/2"	11	24.63	28.37	23.15 39.81
4"	10	30.54	35.20	28.66 49.90
4 1/2"	10	37.35	43.04	35.22
5"	9	46.87	54.01	44.25 73.93
6"	7	71.96	82.93	68.14

Rails, Supplies

Standard rails, over 60-lb., f.o.b. mill, gross ton, \$40.00.

Light rails (billet), Pittsburgh, Chicago, Birmingham, gross ton, \$40.00.

*Relaying rails, 35 lbs. and over, f.o.b. railroad and basing points, \$28-\$30.

Supplies: Angle bars, 2.70c; tie plates, 2.15c; track spikes, 3.00c; track bolts, 4.75c; do. heat treated, 5.00c.

*Fixed by OPA Schedule No. 46, Dec. 15, 1941.

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, base, cents per lb.: Reg. carbon 14.00c; extra carbon 18.00c; special carbon 22.00c; oil-hardening 24.00c; high car.-chr. 43.00c.

High Speed Tool Steels:

	Tung.	Chr.	Van.	Moly.	Pitts. base, per lb.
18.00	4	1	1	1	67.00c
18.00	4	2	1	1	77.00c
18.00	4	3	1	1	87.00c
1.5	4	1	1	8.5	54.00c
5.50	4	2	1	8	54.00c
5.50	4	1.50	4	4	57.50c
5.50	4.50	4	4.50	4	70.00c

Stainless Steels

Base, Cents per lb.—f.o.b. Pittsburgh

CHROMIUM NICKEL STEEL

Type	Bars	Plates	Sheets	H. R.	C. R.
302	24.00c	27.00c	34.00c	21.50c	28.00c
303	26.00	29.00	36.00	27.00	33.00
304	25.00	29.00	36.00	23.50	30.00
308	29.00	34.00	41.00	28.50	35.00
309	36.00	40.00	47.00	37.00	47.00
310	49.00	52.00	53.00	48.75	56.00
311	49.00	52.00	53.00	48.75	56.00
312	36.00	40.00	49.00		
*316	40.00	44.00	48.00	40.00	48.00
†321	29.00	34.00	41.00	29.25	38.00
†347	33.00	38.00	45.00	33.00	42.00
431	19.00	22.00	29.00	17.50	22.50

STRAIGHT CHROMIUM STEEL

403	21.50	24.50	29.50	21.25	27.00
**410	18.50	21.50	26.50	17.00	22.00
416	19.00	22.00	27.00	18.25	23.50
†420	24.00	28.50	33.50	23.75	36.50
430	19.00	22.00	29.00	17.50	22.50
†430F	19.50	22.50	29.50	18.75	24.50
442	22.50	25.50	32.50	24.00	32.00
446	27.50	30.50	36.50	35.00	52.00
501	8.00	12.00	15.75	12.00	17.00
502	9.00	13.00	16.75	13.00	18.00

STAINLESS CLAD STEEL (20%)

304	118.00	19.00
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*With 2-3% moly. †With titanium. ‡With columbium. **Plus machining agent. ††High carbon. †††Free machining. †††Includes annealing and pickling.

Basing Point Prices are (1) those announced by U. S. Steel Corp. subsidiaries for first quarter of 1941 or in effect April 16, 1941 at designated basing points or (2) those prices announced or customarily quoted by other producers at the same designated points. Base prices under (2) cannot exceed those under (1) except to the extent prevailing in third quarter of 1940.

Extras mean additions or deductions from base prices in effect April 16, 1941.

Delivered prices applying to Detroit, Eastern Michigan, Gulf and Pacific Coast points are deemed basing points except in the case of

the latter two areas when water transportation is not available, in which case nearest basing point price, plus all-rail freight may be charged.

Domestic Ceiling prices are the aggregate of (1) governing basing point price, (2) extras and (3) transportation charges to the point of delivery as customarily computed. **Governing basing point** is basing point nearest the consumer providing the lowest delivered price.

Emergency basing point is the basing point at or near the place of production or origin of shipment.

Seconds or off-grade iron or steel products cannot be sold at delivered prices exceeding those applying to material of prime quality.

Export ceiling prices may be either the aggregate of (1) governing basing point or emergency basing point (2) export extras (3) export transportation charges provided they are the f.a.s. seaboard quotations of the U. S. Steel Export Co. on April 16, 1941. Domestic or export extras may be used in case of Lease-Lend tonnage.

Bolts, Nuts

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

Carriage and Machine

1/2 x 6 and smaller	65 1/2 off
Do., 3/4 and 1/2 x 6-in. and shorter	63 1/2 off
Do., 3/4 to 1 x 6-in. and shorter	61 off
1 1/2 and larger, all lengths	59 off
All diameters, over 6-in. long	59 off
Tire bolts	50 off
Step bolts	56 off
Plow bolts	65 off

Stove Bolts

In packages with nuts separate 71-10 off; with nuts attached 71 off; bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Nuts

	U.S.S.	S.A.E.
1/2-inch and less	62	64
3/4-1-inch	59	60
1 1/2-1 1/2-inch	57	58
1 1/2 and larger	56	

Hexagon Cap Screws

Upset 1-in., smaller 64 off

Milled 1-in., smaller 60 off

Square Head Set Screws

Upset, 1-in., smaller 71 off

Headless, 1/2-in., larger 60 off

No. 10, smaller 70 off

Piling

Pittsburgh, Chicago, Buffalo 2.40c

Rivets, Washers

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham

Structural 3.75c

1/2-inch and under 65-5 off

Wrought washers, Pittsburgh, Chicago, Philadelphia, to jobbers and large nut, bolt manufacturers i.e.l. \$2.75-3.00 off

Metallurgical Coke

Price Per Net Ton

Beehive Ovens

Connellsville, furnace	\$6.00
Connellsville, foundry	7.00-7.50
Connellsville prem. fdry.	7.25-7.60
New River, foundry	8.00-8.25
Wise county, foundry	7.50
Wise county, furnace	6.50

By-Product Foundry

Kearny, N. J., ovens	12.15
Chicago, outside delivered	11.50
Chicago, delivered	12.25
Terre Haute, delivered	12.00
Milwaukee, ovens	12.25
New England, delivered	13.75
St. Louis, delivered	12.25
Birmingham, ovens	8.50
Indianapolis, delivered	12.00
Cincinnati, delivered	11.75
Cleveland, delivered	12.30
Buffalo, delivered	12.50
Detroit, delivered	12.25
Philadelphia, delivered	12.38

Operators of hand-drawn ovens using trucked coal may charge \$6.50, effective Aug. 12, 1942. † \$12.75 from other than Ala., Mo., Tenn.

Coke By-Products

Spot, gal., freight allowed east of Omaha	
Pure and 90% benzol	15.00c
Toluol, two degree	28.00c
Solvent naphtha	27.00c
Industrial xylol	27.00c

Per lb. f.o.b. works
Phenol (car lots, returnable drums) 12.50c
Do. less than car lots 13.25c
Do. tank cars 11.50c

Eastern Plants, per lb.
Naphthalene flakes, balls, bbls. to jobbers 8.00c

Per ton, bulk, f.o.b. port
Sulphate of ammonia \$29.20

Pig Iron

Prices (In gross tons) are maximums fixed by OPA Price Schedule No. 10, effective June 10, 1941. Exceptions indicated in footnotes. Allocation regulations from WPB Order M-17, expiring Dec. 31, 1942. Base prices bold face, delivered light face.

	No. 2 Foundry		Bessemer	Malleable
	Basic	Bessemer		
Bethlehem, Pa., base	\$25.00	\$24.50	\$26.00	\$25.50
Newark, N. J., del.	26.62	26.12	27.62	27.12
Brooklyn, N. Y., del.	27.65	27.15	28.65	28.15
Birdsboro, Pa., del.	25.00	24.50	26.00	25.50
Birmingham, base	†20.38	†19.00	.....	.....
Baltimore, del.	25.67	.....	.....	.....
Boston, del.	25.12	.....	.....	.....
Chicago, del.	†24.47	.....	.....	.....
Cincinnati, del.	24.30	22.92	.....	.....
Cleveland, del.	24.12	23.24	.....	.....
Newark, N. J., del.	26.24	.....	.....	.....
Philadelphia, del.	25.51	25.01	.....	.....
St. Louis, del.	†24.12	23.24	.....	.....
Buffalo, base	24.00	23.00	25.00	24.50
Boston, del.	25.50	25.00	26.50	26.00
Rochester, del.	25.53	.....	26.53	26.03
Syracuse, del.	26.08	.....	27.08	26.58
Chicago, base	24.00	23.50	24.50	24.00
Milwaukee, del.	25.17	24.67	25.67	25.17
Muskegon, Mich., del.	27.38	.....	.....	27.38
Cleveland, base	24.00	23.50	24.50	24.00
Akron, Canton, O., del.	25.47	24.97	25.97	25.47
Detroit, base	24.00	23.50	24.50	24.00
Saginaw, Mich., del.	26.45	25.95	26.95	26.45
Duluth, base	24.50	.....	25.00	24.50
St. Paul, del.	26.76	.....	27.26	26.76
Erie, Pa., base	24.00	23.50	25.00	24.50
Everett, Mass., base	25.00	24.50	26.00	25.50
Boston	25.50	25.00	26.50	26.00
Granite City, Ill., base	24.00	23.50	24.50	24.00
St. Louis, del.	24.50	24.00	.....	24.50
Hamilton, O., base	24.00	23.50	.....	24.00
Cincinnati, del.	24.68	24.68	.....	25.35
Neville Island, Pa., base	24.00	23.50	24.50	24.00
§Pittsburgh, del. ....	.....	.....	.....	.....
No. & So. sides	24.69	24.19	25.19	24.69
Provo, Utah, base	22.00	.....	.....	.....
Sharpsville, Pa., base	24.00	23.50	24.50	24.00
Sparrows Point, Md., base	25.00	24.50	.....	.....
Baltimore, del.	26.05	.....	.....	.....
Steelton, Pa., base .....	.....	24.50	.....	25.50
Swedeland, Pa., base	25.00	24.50	26.00	25.50
Philadelphia, del.	25.89	25.39	.....	26.39
Toledo, O., base	24.00	23.50	24.50	24.00
Mansfield, O., del.	26.06	25.56	26.56	26.06
Youngstown, O., base	24.00	23.50	24.50	24.00

*Basic silicon grade (1.75-2.25%), add 50c for each 0.25%. †For phosphorus 0.70 and over deduct 38c. ‡Over 0.70 phos. §For McKees Rocks, Pa., add .55 to Neville Island base; Lawrenceville, Homestead, McKeesport, Ambridge, Monaca, Aliquippa, .84; Monessen, Monongahela City .97 (water); Oakmont, Verona 1.11; Brackenridge 1.24.

High Silicon, Silvery

6.00-6.50 per cent (base)	\$29.50
6.51-7.00	\$30.50
7.01-7.50	31.50
7.51-8.00	32.50
8.01-8.50	33.50
8.51-9.00	34.50

9.01-9.50 \$35.50
9.51-10.00 36.50
10.01-10.50 37.50
10.51-11.00 38.50
11.01-11.50 39.50

F.o.b. Jackson county, O., per gross ton. Buffalo base prices are \$1.25 higher. Prices subject to additional charge of 50 cents a ton for each 0.50% manganese in excess of 1.00%.

Bessemer Ferrosilicon

Prices same as for high silicon silvery iron, plus \$1 per gross ton. (For higher silicon irons a differential over and above the price of base grades is charged as well as for the hard chilling irons, Nos. 5 and 6.)

Charcoal Pig Iron

Northern	
Lake Superior Furn.	\$28.00
Chicago, del.	31.54

Southern

Semi-cold blast, high phos, f.o.b. furnace, Lyles, Tenn.	\$28.50
Semi-cold blast, low phos., f.o.b. furnace, Lyles, Tenn.	33.00

Gray Forge

Neville Island, Pa.	\$23.50
Valley, base	23.50

Low Phosphorus

Basing points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., \$29.50 base; \$30.81, delivered, Philadelphia.

Switching Charges: Basing point prices are subject to an additional charge for delivery within the switching limits of the respective districts.

Silicon Differentials: Basing point prices are subject to an additional charge not to exceed 50 cents a ton for each 0.25 silicon in excess of base grade (1.75 to 2.25%).

Phosphorous Differential: Basing point prices are subject to a reduction of 38 cents a ton for phosphorous content of 0.70% and over.

Manganese Differentials: Basing point prices subject to an additional charge not to exceed 50 cents a ton for each 0.50% manganese content in excess of 1.0%.

Celling prices are the aggregate of (1) governing basing point (2) differentials (3) transportation charges from governing basing point to point of delivery as customarily computed. Governing basing point is the one resulting in the lowest delivered price for the consumer.

Exceptions to Celling Prices: Pittsburgh Coke & Iron Co. (Sharpsville, Pa. furnace only) and Struthers Iron & Steel Co. may charge 50 cents a ton in excess of basing point prices for No. 2 Foundry, Basic, Bessemer and Malleable, Mystic Iron Works, Everett, Mass., may exceed basing point prices by \$1 per ton, effective April 20, 1942. Chester, Pa., furnace of Pittsburgh Coke & Iron Co. may exceed basing point prices by \$2.25 per ton, effective July 27, 1942.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick	
Super Quality	
Pa., Mo., Ky.	\$64.60

First Quality	
Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00
Ohio	43.00

Second Quality	
Pa., Ill., Md., Mo., Ky.	46.55
Alabama, Georgia	38.00
New Jersey	49.00
Ohio	46.00

Malleable Hung Brick	
All bases	\$59.85

Silica Brick	
Pennsylvania	\$51.50
Joliet, E. Chicago	58.90
Birmingham, Ala.	51.30

Ladle Brick	
(Pa., O., W. Va., Mo.)	
Dry press	\$31.00
Wire cut	29.00

Magnesite	
Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00

Basic Brick	
Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.	
Chrome brick	\$54.00
Chem. bonded chrome	54.00
Magnesite brick	76.00
Chem. bonded magnesite	65.00

Fluorspar

Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	\$23.00-25.00
Do., barge	23.00-25.00
No. 2 lump	23.00-25.00

(OPA May 11 established maximum at Jan. 2, 1942, level.)

Ferroalloy Prices

Ferromanganese: 78-82%, carlots, gross ton, duty paid, Atlantic ports, \$135; Del. Pittsburgh \$140.65; f.o.b. Southern furnaces \$135; Add \$6 per gross ton for packed carloads \$10 for ton, \$13.50 for less-ton and \$18 for less than 200-lb. lots, packed.

Spiegeleisen: 19-21%, carlots per gross ton, Palmerton, Pa. \$36.

Electrolytic manganese: 99.9% plus, less ton lots, per lb. 42.00c. Ton lots 40.00c. Annual contracts 38.00c.

Chromium Metal: Per lb. contained chromium in gross ton lots, contract basis, freight allowed, 98% 80.00c, 88% 79.00c. Spot prices 5 cents per lb. higher.

Ferrocolumbium: 50-60%, per lb. contained columbium in gross ton lots, contract basis, f.o.b. Niagara Falls, N. Y. \$2.25; less-ton lots \$2.30. Spot prices 10 cents per lb. higher.

Ferrochrome: 66-70%; per lb. contained chromium in carloads, freight allowed, 4-6% carbon 13.00c; ton lots 13.75c; less-ton lots 14.00c; less than 200-lb. lots 14.25c. 66-72%, low carbon grades:

	Car loads	Ton	Less 200 lbs.	Less 200 lbs.
2% C.	19.50c	20.25c	20.75c	21.00c
1% C.	20.50c	21.25c	21.75c	22.00c
0.20% C.	21.50c	22.25c	22.75c	23.00c
0.10% C.	22.50c	23.25c	23.75c	24.00c

Spot is ¼c higher

Chromium briquets: Contract basis in carloads per lb., freight allowed 8.25c; packed 8.50c; gross ton lots 8.75c; less-ton lots 9.00c; less 200-lb. lots 9.25c. Spot prices ¼-cent higher.

Ferromolybdenum: 55-75%, per lb. contained molybdenum, f.o.b. Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Calcium Molybdate (Molyte): 40-45%, per lb. contained molybdenum, contract basis, f.o.b. Langeloth and Washington, Pa., any quantity, 80.00c.

Molybde Oxide Briquets: 48-52%, per lb. contained molybdenum, f.o.b. Langeloth, Pa., any quantity 80.00c.

Molybdenum Oxide: 53-63%, per lb. molybdenum contained cans, f.o.b. Langeloth and Washington, Pa., any quantity 80.00c.

Molybdenum Powder: 99% per lb. in 200-lb. kegs, f.o.b. York, Pa. \$2.60; 100-200 lb. lots \$2.75; under 100-lb. lots \$3.00.

Ferrophosphorus: 17-19%, based on 18% phosphorus content, with unitage of \$3 for each 1% of phosphorus above or below the base; gross tons per carload f.o.b. sellers' works, with freight equalized with Rockdale, Tenn.; contract price \$58.50, spot \$62.25.

Ferrophosphorus: 23-26%, based on 24% phosphorus content, with unitage of \$3 for each 1% of phosphorus above or below the base; gross tons per carload f.o.b. sellers' works, with freight equalized with Mt. Pleasant, Tenn.; contract price \$75, spot \$80.

Ferrosilicon: Contract basis in gross tons per carload, bulk, freight allowed; unitage applies to each 1% silicon above or below base.

	Carloads	Ton lots
50%	\$ 74.50	\$ 87.00
Unitage	1.50	1.75
75%	135.00	151.00
Unitage	1.80	2.00
85%	170.00	188.00
Unitage	2.00	2.20
90-95%	10.25c	11.25c

Spot prices ¼-cent higher.

Silicon Metal: Contract basis per lb., f.o.b. producers' plants, freight allowed; 1% iron; carlots 14.50c, ton lots 15.00c, less-ton lots 15.25c, less 200 lbs. 15.50c.

Silicon Metal: Contract basis per lb.; 2% iron; carlots 13.00c, ton lots 13.50c, less-ton lots 13.75c, less 200 lbs. 14.00c. Spot prices ¼-cent higher.

Silicon Briquets: Contract basis; in carloads, bulk freight allowed, per ton \$74.50; packed \$80.50; ton lots \$84.50; less-ton lots per lb. 4.00c; less 200-lb. lots per lb. 4.25c. Spot ¼-cent per lb. higher on less-ton lots; \$5 per ton higher on ton lots and over.

Silicomanganese: Contract basis freight allowed, 1½% carbon; in carloads per gross ton \$128; ton lots \$140.50. Spot \$5 per ton higher.

Silico-manganese Briquets: Contract basis in carloads per pound, bulk freight allowed 5.50c; packed 5.75c; ton lots 6.00c; less-ton lots 6.25c; less 200-lb. lots 6.50c. Spot prices ¼-cent higher.

Ferrotungsten: Carlots, per lb. contained tungsten, \$1.90.

Tungsten Metal Powder: 98-99%, per lb. any quantity \$2.55-2.65.

Ferrotitanium: 40-45%, f.o.b. Niagara Falls, N. Y., per lb. contained

titanium; ton lots \$1.23; less-ton lots \$1.25. Spot 5 cents per lb. higher.

Ferrotitanium: 20-25%, 0.10 maximum carbon; per lb. contained titanium; ton lots \$1.35; less-ton lots \$1.40. Spot 5 cents per lb. higher.

High-Carbon Ferrotitanium: 15-20%, Contract basis, per gross ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and North of Baltimore and St. Louis, 6-8% carbon \$142.50; 3-5% carbon \$157.50.

Ferrovandium: 35-40%, contract basis, per lb. contained vanadium, f.o.b. producer's plant with usual freight allowances; open-hearth grade \$2.70; special grade \$2.80; highly-special grade \$2.90.

Vanadium Pentoxide: Technical grade, 88-92 per cent V₂O₅; contracts, any quantity, \$1.10 per pound V₂O₅, contained; spot 5 cents per pound higher.

Zirconium Alloys: 12-15%, contract basis, carloads bulk, per gross ton \$102.50; packed \$107.50; ton lots \$108; less-ton lots \$112.50. Spot \$5 per ton higher.

Zirconium alloy: 35-40%, contract basis, carloads in bulk or package, per lb. of alloy 14.00c; gross ton lots 15.00c; less-ton lots 16.00c. Spot ¼-cent higher.

Alister: (Approx. 20% aluminum, 40% silicon, 40% iron) Contract basis, f.o.b. Niagara Falls, N. Y., per lb. 7.50c; ton lots 8.00c. Spot ¼-cent higher.

Simanal: (Approx. 20% each silicon, manganese, aluminum) Contract basis, freight allowed, per lb. of alloy; carlots 10.50c; ton lots 11.00c, less ton lots, 11.50c.

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials. As of April 16, 1942

	Soft Bars	Hot-rolled Strip		Plates ½-in. & Over	Structural Shapes	Floor Plates	Sheets			Cold Rolled Strip	Cold Drawn Bars		
		Bands	Hoops				Hot Rolled	Cold Rolled	Galv. No. 24		Carbon	S.A.E. 2300	S.A.E.
Boston	3.98	4.06	5.06	3.85	3.85	5.66	3.71	4.68	5.11	3.46	4.13	8.88	7.23
New York (Met.)	3.84	3.96	3.96	3.76	3.75	5.56	3.58	4.60	5.00	3.51	4.09	8.84	7.19
Philadelphia	3.85	3.95	4.45	3.55	3.55	5.25	3.55	4.05	4.65	3.31	4.06	8.56	7.16
Baltimore	3.85	4.00	4.35	3.70	3.70	5.25	3.50	...	5.05	...	4.04	...	...
Norfolk, Va.	4.00	4.10	...	4.05	4.05	5.45	3.85	...	5.40	...	4.15	...	...
Buffalo	3.35	3.82	3.82	3.62	3.40	5.25	3.25	4.30	4.75	3.52	3.75	8.40	6.75
Pittsburgh	3.35	3.60	3.60	3.40	3.40	5.00	3.35	...	4.65	...	3.65	8.40	6.75
Cleveland	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.05	4.62	3.20	3.75	8.40	6.75
Detroit	3.43	3.43	3.68	3.60	3.65	5.27	3.43	4.30	4.84	3.40	3.80	8.70	7.05
Omaha	4.10	4.20	4.20	4.15	4.15	5.75	3.85	5.32	5.50	...	4.42	...	...
Cincinnati	3.60	3.67	3.67	3.65	3.68	5.28	3.42	4.37	4.92	3.45	4.00	8.75	7.10
Chicago	3.50	3.60	3.60	3.55	3.55	5.15	3.25	4.10	4.85	3.50	3.75	8.40	6.75
Twin Cities	3.75	3.85	3.85	3.80	3.80	5.40	3.50	4.35	5.00	3.83	4.34	9.09	7.44
Milwaukee	3.63	3.53	3.53	3.68	3.68	5.28	3.38	4.23	4.98	3.54	3.88	8.38	6.98
St. Louis	3.64	3.74	3.74	3.69	3.69	5.29	3.39	4.24	4.99	3.61	4.02	8.77	7.12
Indianapolis	3.60	3.75	3.75	3.70	3.70	5.30	3.45	...	5.01	...	3.97	...	...
Chattanooga*	3.80	4.00	4.00	3.85	3.85	5.80	3.75	...	4.50	...	4.39	...	...
Memphis	3.90	4.10	4.10	3.95	3.95	5.71	3.85	...	5.25	...	4.31	...	...
Birmingham	3.50	3.70	3.70	3.55	3.55	5.93	3.45	...	4.75	...	4.43	...	...
New Orleans	4.00	4.10	4.10	3.80	3.80	5.75	3.85	...	5.25	5.00	4.60	...	...
Houston, Tex.	3.75	4.30	4.30	4.05	4.05	5.50	4.00	...	5.25	...	6.90	...	...
Seattle	4.20	4.25	5.45	4.75	4.45	6.50	4.65	7.60	5.70	...	5.75	...	...
Los Angeles	4.35	4.90	6.70	4.90	4.60	7.15	4.95	7.15	5.95	...	6.60	10.55	9.55
San Francisco	3.95	4.50	6.25	4.65	4.35	6.35	4.55	6.40	6.10	...	6.80	10.80	9.80

*Not named in OPA price order.

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds; 300-1999 pounds in Los Angeles; 400-39,999 (hoops, 0-299) in San Francisco; 300-4999 pounds in Portland; 300-9999 Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in B'ham., Memphis.
Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York, Omaha, Kansas City, St. Louis; 450-3749 in Boston; 500-1499 in Buffalo; 1000-1999 in Philadelphia, Baltimore; 750-4999 in San Francisco; 300-4999 in Portland, Seattle; any quantity in Twin Cities, New Orleans; 300-1999 Los Angeles.

Galvanized Sheets: Base, 150-1499 pounds, New York; 150-1499 in Cleveland, Pittsburgh, Baltimore, Norfolk; 150-1049 in Los Angeles; 300-10,000 in Portland, Seattle; 450-3749 in Boston; 500-1499 in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, Indianapolis, Milwaukee, Omaha, St. Louis, Tulsa; 3500 and over in Chattanooga; any quantity in Twin Cities; 750-1500 in Kansas City; 150 and over in Memphis; 25 to 49 bundles in Philadelphia; 750-4999 in San Francisco.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1500 pounds and over on carbon, except 0-299 in San Francisco, 500-999, Los Angeles, 1000 and over in Portland, Seattle; 1000 pounds and over on alloy, except 0-4999 in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 pounds and over, except 0-4999. San Francisco; 0-1999, Portland, Seattle.

S.A.E. Hot-rolled Bars (Unannealed)

	S.A.E. Hot-rolled Bars (Unannealed)				
	1035-1050 Series	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.28	7.75	6.05	5.80	7.90
New York (Met.)	4.04	7.60	5.90	5.65	...
Philadelphia	4.10	7.56	5.86	5.61	8.56
Baltimore	4.45	...	...	...	...
Norfolk, Va.	...	...	...	...	...
Buffalo	3.55	7.35	5.65	5.40	7.50
Pittsburgh	3.40	7.45	5.75	5.50	7.60
Cleveland	3.30	7.55	5.85	5.85	7.70
Detroit	3.48	7.67	5.97	5.72	7.19
Cincinnati	3.65	7.69	5.99	5.74	7.84
Chicago	3.70	7.35	5.65	5.40	7.50
Twin Cities	3.95	7.70	6.00	6.09	8.19
Milwaukee	3.83	7.33	5.88	5.63	7.73
St. Louis	3.84	7.72	6.02	5.77	7.87
Seattle	6.25	...	8.00	7.85	8.65
Los Angeles	4.80	9.55	8.55	8.40	8.80
San Francisco	5.45	9.80	8.80	8.65	9.05

EUROPEAN IRON, STEEL PRICES

Dollars at \$4.02½ per Pound Sterling

Export Prices f.o.b. Port of Dispatch—

By Cable or Radio

	BRITISH	
	Gross Tons	f.o.b. U.K. Ports
Merchant bars, 3-inch and over	\$66.50	16 10 0
Merchant bars, small, under 3-inch, re-rolled	3.60c	20 0 0
Structural shapes	2.95c	15 10 0
Ship plates	2.90c	16 2 6
Boiler plates	5.17c	17 12 6
Sheets, black, 24 gage	4.00c	22 5 0
Sheets, galvanized, corrugated, 24 gage	4.61c	25 12 6
Tin plate, base box, 20 x 14, 108 pounds	\$ 6.20	1 10 9

British ferromanganese \$120.00 delivered Atlantic seaboard duty-paid.

Domestic Prices Delivered at Works or Furnace—

	L	S	D
Foundry No. 3 Pig Iron, Silicon 2.50-3.00	\$25.79	6	8 0 (a)
Basic pig iron	24.28	6	0 6 (a)
Furnace coke, f.o.c. ovens	8.87	2	4 0
Billets, basic soft, 100-ton lots and over	49.37	12	5 0
Standard rails, 60 lbs. per yard, 500-ton lots & over	2.61c	14	10 6
Merchant bars, rounds and squares, under 3-inch	3.17c	17	12 0††
Shapes	2.77c	15	8 0††
Ship plates	2.91c	16	3 0††
Boiler plates	3.06c	17	0 6††
Sheets, black, 24 gage, 4-ton lots and over	4.10c	22	15 0
Sheets, galvanized 24 gage, corrugated, 4-ton lots & over	4.70c	26	2
Plain wire, mild drawn, catch weight coils, 2-ton lots and over	4.28c	23	15 0
Bands and strips, hot-rolled	5.30c	18	7 0

(a) del. Middlebrough. ††Rebate 15¢ on certain conditions. 5¢ rebate to approved customers.

Ores

Lake Superior Iron Ore

Gross ton, 51½%	
Lower Lake Ports	
Old range bessemer	\$4.75
mer	4.45
High phosphorus	4.35
Nesabi bessemer	4.60
Old range nonbessemer	4.50

Eastern Local Ore

Cents, unit, del. E. Pa.	
Foundry and basic 56-63%, contract	13.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports	
Manganiferous ore. 45-55% Fe., 6-10% Mang.	Nom.
N. African low phos.	Nom.
Spanish, No. African basic, 50 to 60%	Nom.
Brazil iron ore. 68-69% f.o.b. Rio de Janeiro.	7.50-8.00c

Tungsten Ore

Chinese wolframite, per short ton unit, duty paid	\$24.00
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Chrome Ore

Gross ton c.i.f. Baltimore; dry basis; subject to penalties for guarantees

Indian and African	
2.8:1 lump, 48%	\$39.00
South African (excluding war risk)	
No ratio lump, 44%	28.00
Do. 45%	29.00
Do. 48%	34.00
Do. concentrates, 48%	33.00
Do. 50%	34.00
Brazilian (nominal)	
2.5:1 lump, 44%	28.50
3:1 lump, 48%	38.00

Manganese Ore

(Nominal)	
Including war risk but not duty, cents per unit cargo lots	
Caucasian, 50-52%	...
S. African, 48%	80.00-86.00
Indian, 50%	80.00-86.00
Brazilian, 46%	78.00-84.00
Cuban, 51%, duty free	85.00
Domestic, 48%, f.o.b. mines	\$1.00

Molybdenum

Sulphide conc., lb., Mo. cont., mines	\$0.75
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Sheets, Strip . . .

Sheet & Strip Prices, Page 118

Indications point to larger production of sheets than at any time in weeks, due to pressure for certain types of munitions, one such product taking considerable tonnage of No. 10 gage. Some sellers find they will be able to handle little hot-rolled tonnage under AA-2. While the rush or reratings has ended, producers still are receiving some new ratings on tonnage which had been moved up during the past few weeks.

Under the quota system with allocations some mills have little additional sheet tonnage to offer and both hot and cold-rolled are tighter. Others have substantial open capacity for cold-rolled and several producers are seeking high-rated volume to fill their quotas. Demand is lagging except for warehouses and tonnage in the AA classification is limited, a few inquiries for bombs being notable. Delivery in about eight weeks is available on cold-rolled sheets with AA-1 rating.

To obtain hot-rolled sheets for cold reducing at least A-1-a is necessary. Most mills are taking no orders for material lighter than 20 gage and active tonnage between 20 gage and 3/16-inch plate is not large. Sheet production is more closely geared to high priority volume entering directly into war equipment and is reflected in tighter control of semifinished steel for sheets.

Plates . . .

Plate Prices Page 119

Pressure for plates seems easier and some interests believe production this month will decline for the second consecutive month, due to the month being one day shorter and to a moderate limitation by Washington to provide more steel for other products. However, no such action is being taken with regard to wide sheared plates, for which excess demand continues.

A better balance as to plate sizes is being attained at shipyards with the over-all tonnage maintained. Plate requirements for miscellaneous shop fabrication tend heavier, however, notably with structural and boiler shops. The latter are building few boilers, but are well engaged as subcontractors, while plants normally building paper and textile mill equipment are fabricating more plates. For special work, demand for wrought iron plates is active with deliveries around four to five weeks on AA-2. Tank inquiry includes sixty-two 515-gallon fuel units for the Civil Aeronautics Administration, bids Sept. 21.

Bars . . .

Bar Prices, Page 118

Stringency in steel bars is increasingly pronounced. Large rounds from 1½ inches up and flats are almost impossible to obtain except on definite allocation. Manufacturing consumers assert it is difficult to obtain promises of shipments under four months, even with high AA ratings.

Jobbers are getting better volume of mill shipments, reflecting more effective operation of the allocation system inaugurated last month with respect to bars and shapes.

A broad system of allocation of hot-rolled bars to cold finishers is scheduled to become effective Oct. 1 on

carbon bars, and Nov. 1 on alloy bars. Details have not been announced but it is believed it will follow general lines proposed on three previous occasions within the past ten months and this time it seems likely to be effective.

Allocations will be set up on a monthly basis and, it is assumed, will cover the allocation order put into effect last month, under which producers are called on to supply a minimum tonnage of hot-rolled bars to cold drawers for processing for warehouse account. The plan also covers semifinished distribution to non-integrated bar producers.

Wire . . .

Wire Prices, Page 119

Wire mill bookings exceed shipments and cover substantial orders for aircraft

alloy specialties, including valve spring wire. Shipments are maintained at a high rate; mills in some instances will have completed deliveries on most rerated orders in the AA group early next quarter. Most new volume takes rating in the AA classification. On the other hand some old tonnage below A-1-a has not been scheduled and in some cases is being taken off books. Rods and heat-treating capacity continue limiting factors in total production.

Some mills in the East are installing more drawing capacity and production in the Worcester district is gradually gaining momentum with additional departments at a new finishing mill getting into operation. Earlier plans to abandon operations at an old mill have been given up for the duration.

Completion of lend-lease shipments for



4 1/8" Lathe Clutch Gear

IT'S MADE OUT OF
SPEED TREAT STEEL
A MEDIUM HIGH CARBON OPEN HEARTH PRODUCT



-because . . .

1. Speed Treat increased production 42%	Ductility
2. Speed Treat reduced scrap 16%	Plus
3. Speed Treat reduced costs \$51.50 per ton of steel used	Machinability
4. Speed Treat replaced shell quality steel	(170 SFPM)

In this "all-out" war effort Monarch Steel is co-operating 100%.
We're helping to "keep 'em rolling" with Speed Treat Steel.

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YOUNGSTOWN, OHIO

MANUFACTURERS OF COLD FINISHED CARBON AND ALLOY STEEL BARS

the current quarter on some wire products is easing the situation in several departments and rope mills are getting wire in better volume. One eastern producer under the mill quota plan is assured enough semifinished from its own works to cover most of its finished wire capacity.

Rails, Cars . . .

Track Material Prices, Page 119

United States district court at St. Louis has authorized the Missouri Pacific to recondition 50 allsteel box cars for use as baggage cars for troop movements and the increased demand of passenger traffic. Former authorization for purchase of 50 new allsteel baggage cars was canceled by WPB to save steel.

Norfolk & Western is inquiring for 100 seventy-ton gondolas and 25 seventy-ton flats. Dow Chemical Co. has placed two tank cars and General Electric Co. one hopper car, both orders going to the American Car & Foundry Co. with WPB approval.

Award of 1000 gondolas by the Union Pacific to Pullman-Standard Car Mfg. Co., Chicago, noted in a recent issue, was reinstatement of an order placed several months ago but frozen late last March, along with many other orders, by WPB.

Pipe . . .

Pipe Prices, Page 119

Cast iron pipe makers have heavy unfilled orders and are handicapped by in-

sufficient pig iron supply. Considerable tonnage is for other war products than pipe and of the latter, government requirements make a large proportion. Other pipe requirements are small, limited by lack of priorities. Municipal buying is held to the minimum for replacements.

Normal demand restricted by lack of building, pipe jobbers dependent on that outlet are seeking direct car lot volume and in some instances are shading prices as much as \$5 a ton; mill quotations are held, but full commissions are waived in these transactions. Several housing projects, held up by lack of high priorities, are being re-rated to AA-3, which is likely eventually to release considerable pipe tonnage. Some pipe sellers are shipping butt weld on A-1-a, but an AA is generally required for lap weld.

Structural Shapes . . .

Structural Shape Prices, Page 119

Shapes appear a little easier, with tentative promises of eight to ten weeks on standard sections. New construction demand is practically at a standstill, due to government limitations. Some observers believe better deliveries will be available soon. Under the mill quota system now in effect some standard shape tonnage will be rolled this month against priorities as low as A-1-a. The situation in wide flange sections is relatively much tighter.

Backlogs of orders for buildings and bridges on fabricators' books are thinning and few new jobs are in prospect. A midwestern fabricator is said to have been asked to set aside his regular work temporarily to assist in getting out steel for a war plant which is behind schedule. Fabricators with direct contracts for naval construction are receiving steel on schedule.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 119

Little new inquiry is coming out for reinforcing materials and prespects are bad for the latter part of the year, as most essential construction will be completed by that time. Suppliers who have much business on books find speedy delivery is required and in some instances fabricating shops are operated Sundays. Mills are keeping even on deliveries of high rated tonnage.

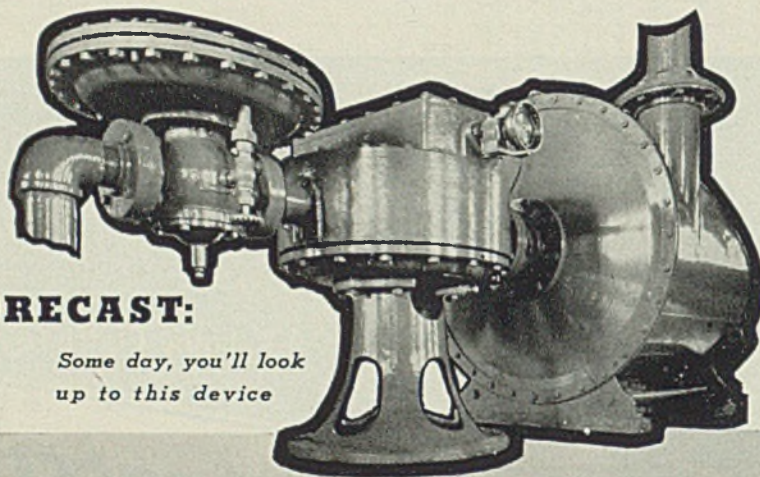
Pig Iron . . .

Pig Iron Prices, Page 120

Pig iron supply is satisfactory and distribution is meeting essential needs, ratings tending constantly to higher levels. Some foundries not yet able to obtain war business are curtailing operations as civilian production is limited.

With smaller allocations to foundry consumers a larger proportion of iron is being diverted to steelmaking, in a measure replacing scrap which is unavailable.

The general blast furnace picture is good, all stacks in several districts being in production, only a few being out for relining. In the East one furnace was blown in last week after relining and another will suspend about Oct. 1. One eastern producer expects to blow in a new stack about Dec. 1 and another in the Buffalo district at about the same time. Tennessee Coal, Iron & Railroad Co. has one stack down for relining, all others in the South being active.



FORECAST:

Some day, you'll look up to this device

**BASIC
in modern mill practice**

This is the patented, exclusive Kemp Industrial Carburetor, the machine that provides *complete* premixing of gas and air to provide new savings, new heat liberation, new flexibility and new control in almost every type of ferrous and non ferrous heat processing.

As the basic unit in Kemp heat treating the Industrial Carburetor supports gas immersion melting in modern tin stacks, provides fuel for inert gas and for recirculating radiators in annealing covers, for Kemp Radiatube Roll Heaters, may be set for exactly the desired flame characteristics whether reducing, oxidizing or for complete combustion . . . and save 15 to 40 percent in fuel. For engineering details and assistance, address **The C. M. Kemp Manufacturing Company, 405 East Oliver Street, Baltimore, Maryland**

KEMP of BALTIMORE

Scrap . . .

Scrap Prices, Page 122

Whether salvage efforts will be able to keep a supply equal to demands through the winter is debatable, but the fact remains that thousands of tons of material are being dragged out of obscurity and converted into new steel. Persons whose interests are remote from the industry are becoming scrap-conscious and are contributing the small lots lying dormant in homes and business places. The aggregate is a decided help to the situation.

A great deal more potential scrap exists and salvage programs are gradually reaching deeper and bringing it to light. Much of the remaining material is of such a nature that its recovery costs more than its market price, the difference being absorbed by government agencies, the value as steelmaking material being greater than the financial considerations involved.

Consumers in the East are receiving somewhat better tonnage as a result of the national drive, but have not been able to build winter supply. Increased pig iron production is providing more material, making up in some degree for scrap shortage.

Ohio state highway department has been ordered by the governor to report all abandoned and outmoded steel and iron bridges which may be scrapped. This is expected to yield considerable tonnage. Some small bridges will be replaced by wood as a temporary measure.

St. Louis scrap yards are receiving increased tonnage, first half of September bringing about 10 per cent more than the corresponding portion of August. Collections are digging deeper. The old federal building yielded old boilers, elevator hoisting gear, steam engines and old iron safes. The municipal government contributed 110 tons of old iron fence, old cannon and other ornaments of various parks. The national cemetery at Jefferson Barracks yielded Civil War cannon balls and other cast iron. Automobile wreckers in Missouri, Arkansas, Kansas and Nebraska are preparing scrap at almost double assigned quotas, the August total being 30,650 tons, almost

equal to the 33,550-ton quota set up for August and September.

Mills in the Buffalo district, contrary to experiences in most areas, are building some winter reserves, about a month's supply having been accumulated. This endeavor is aided by heavy boat shipments from the upper lake region, an estimate placing such receipts for this season so far at more than 210,000 tons. This region is receiving imports from Canada, where the situation is easier than on this side of the border.

Chicago mills are feeling the effects of concerted drives and the extreme scarcity that recently caused two open hearths to suspend for several days has been relieved at least temporarily. Needs

of this district are tremendous and continuation of present efforts will be necessary to hold supply up to requirements.

Success of the drive for tin cans for salvage of the tin coating, which also yields scrap for compressed bundles, is only moderate and tonnage in large centers has proved a disappointment. Educational endeavors to increase this salvage are being continued.

Iron Ore . . .

Iron Ore Prices, Page 137

The ore trade expects early announcement of ceiling prices on manganese and chrome, with much speculation as to what figures will be named. General

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

Our Duty
For the Duration

In a total war, the efforts of every man, woman and yes, child, count in the final victory. Our obligation consists of (a) helping to conserve precious tin supplies, and (b) seeing to it that proper bearing metals find their way into every shop, mill and plant where war production is in full swing. Our primary obligation is being met by supplying Cadman Acorn Brand Babbitt Metal only in cases where its peculiar properties are vital, and where investigation proves that it is necessary. This practice will save tin. Our secondary obligation is being met by supplying BEARITE, a low tin base (less than 1 1/2% tin) babbitt metal for all bearing applications having rotary motion. BEARITE has been proven by 20 years of general use, and gives comparable service.

BEARITE

A. W. Cadman Mfg. Co.

PITTSBURGH, PA.

CHICAGO: MANHATTAN BLDG. PHILADELPHIA: 18 W. CHELTEN ST. NEW YORK: 270 BROADWAY

opinion is that the ceiling on manganese ore will be about 88 to 90 cents, c.i.f., Atlantic and Gulf ports, with the probability that the maximum will be nearer the outside figure. On chrome, it is believed that the ceiling will be around \$43.00, c.i.f., for the basic metallurgical grade and \$31.00 for the refractory grade. However, such prices represent nothing more than speculation until definite announcement is made.

Whatever prices are established will represent the maximum that consumers will have to pay the Metals Reserve Co. Apparently consumers, if they so desire, can pay more on direct purchases from abroad. However, it stands to reason that domestic consumers will not pay more abroad if they can obtain material

through the Metals Reserve. It appears that whatever premium may be paid abroad will be paid by the Metals Reserve Co., with this organization absorbing the loss.

Meanwhile, some domestic buyers of both chrome and manganese ore are turning to Metals Reserve for supplies.

Eastern foundry and basic ores, 56-63 per cent, contract, are now holding at around 13 per unit delivered eastern Pennsylvania. This is said to be approximately the equivalent of prices being paid in the east for Lake ores.

American iron ore carriers on the Great Lakes, Sept. 15, numbered 303 vessels, a gain of one over Aug. 15, the trip capacity being increased 19,000 tons. Pittsburgh Steamship Co. with-

drew one ship and put in service two of its new carriers, each of the largest capacity, according to the monthly report of C. C. Lindeman, statistician for the M. A. Hanna Co. Canadian ships to the number of 35 have participated in the ore movement this season.

Warehouse . . .

Warehouse Prices, Page 121

Mill shipments to warehouse are being sustained at the average of August in most cases and there are indications that volume for September as a whole may run higher, enabling better service to be given to consumers depending on them for their supply.

Quantities of the new NE steel are still disappointingly low, and tonnage is distributed as widely as possible. Purchasers able to get it are co-operating well in reporting service tests. Curiously, however, it develops that about 50 per cent of the steel is being used in the as-rolled condition, whereas the proportion might have been estimated at about 10 per cent. This means that only half is heat treated, and would provide a basis for application reports.

Semifinished . . .

Semifinished Prices, Page 118

Semifinished material remains the chief bottleneck in all steelmaking processes. As a result some rolling mills are buying steel outside, especially slabs used to roll plate on converted strip mills.

Increased quotas on bar mills this month have increased pressure for billets largely at the expense of slabs. Demand continues to increase for shell rounds, and some rail programs are being held up while rail mills push out various semifinished shapes for shell production. Wire rod quotas are lower, and there is a considerable idle capacity on rod mills now.

Tin Plate . . .

Tin Plate Prices, Page 119

Tin and terne plate and black sheets for tinning will be placed under closer control by a program now being established. This calls for filing of forms with Washington each month by consumers and producers, covering information which will enable WPB to set up tonnages for the second subsequent month. These forms, 612 to 614, inclusive, now are being filed for November. This plan is similar in some respects to the plate allocation program, but calls for figures for the second month instead of the first, due to longer time required for processing the coated steel.

Steel in Europe . . .

Foreign Steel Prices, Page 121

London (By Cable)—Demand for steel sheets in Great Britain is more active and producers have heavy order backlogs. Builders of locomotives and freight cars are fully engaged. Producers of special steels are obtaining record output but are unable to equal the heavy demand they encounter.

Pacific Coast . . .

San Francisco—With few exceptions all steel orders being placed are in connection with national defense projects.

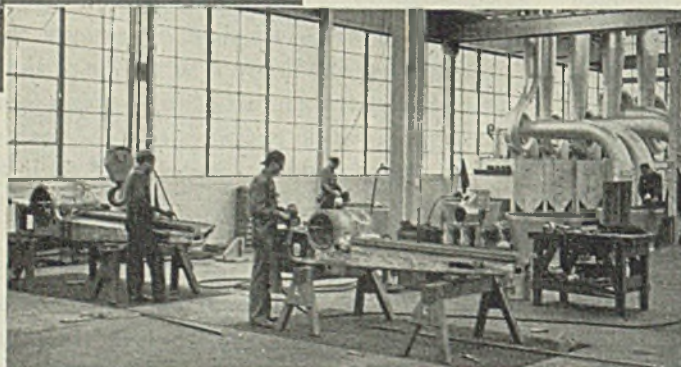


ROTO-CLONES

Collect Grinding Dust at Cincinnati Bickford Tool Co.

Lower view shows three types of grinding stations served by the battery of 5 type Roto-Clones. These stations include floor grills, rectangular and round tables.

Grinding dust is pulled thru grills at the grinding stations and conveyed thru ducts in pipe trenches to the Roto-Clone Precipitators.



The collection of fine floating dust from portable grinding in Cincinnati Bickford's large finishing department is performed by 5 type D Roto-Clones. These units serve 10 stations comprising 4 floor grills, 4 rectangular tables, and 2 round tables. A total of 51,000 cubic feet of air per minute is exhausted which carries the generated dust downward from the grinding tools through grilled openings beneath the work.

Complete information on the application of the Roto-Clone to all types of industrial dust control is available without obligation. Write for Roto-Clone Bulletin No. 272.

AMERICAN AIR FILTER CO., INC.

INCORPORATED

443 Central Avenue Louisville, Kentucky
In Canada: Darling Bros., Ltd., Montreal, P. O.



Private work is practically at a standstill and little new business is expected to develop until after the emergency.

Development of the ferrous and non-ferrous industries in the 11 western states since the declaration of war has been enormous and exceeds 150 per cent of the former capacity. This will have a decided effect on the situation, as it applies to the western area, when the emergency is over. In 1943 plate producing capacity will exceed 1,000,000 tons. The former high total in tons, consumed in this area in 1929, aggregated 247,367 tons, when many huge crude oil tanks were erected.

Government contracts of size, placed recently, includes a Navy supply depot at Spokane, exceeding \$8,000,000, placed with Clifton & Applegate, Spokane, a marine corps training station at Santa Margarita, Calif., at over \$13,000, let to Engineers Ltd., Pasadena, Calif. Swinerton & Walberg Co., San Francisco, United Concrete Pipe Corp., Los Angeles, and A. S. Vinnell, Alhambra, Calif., secured a contract at over \$5,000,000 for fuel storage facilities at the Naval fuel depot at San Pedro, Calif.

A supplemental award went to Barrett & Hilp Co., San Francisco, at over \$3,350,000 for additional facilities at an airport depot, hospital and radio station at Mare Island, Calif. Geo. Pollock Co., Sacramento, Calif., and Guy F. Atkinson Co., San Francisco, booked an award at close to \$6,000,000 for additional facilities at Roosevelt Base, Terminal Island, Calif. Austin Co. took additional facilities at Whidby Island, Wash., and at the Tongue Point, Oreg., Naval air station, involving almost \$10,000,000. Three air base awards in Washington, involving between \$1,000,000 and \$5,000,000, were placed with two Tacoma, Wash., firms. Woodworth & Co., and the Macdonald Building Co.

Seattle—Contracts have been placed for erection of a proposed plant for the Oregon Electric Steel Rolling Mills at Portland, Oreg., according to Morris Schnitzer, president, who plans production by the end of the year. D. J. Malarkey, Portland contractor, has completed foundations and has an additional award for erection of plant structures. J. H. Pomeroy Co., San Francisco, will do the steel erection work, tonnages unstated. Company officials claim to have A-A-3 priorities for materials.

Due to war conditions and lack of expected federal financial aid, Seattle has rejected bids for the raising of Ross dam, Skagit power project. Originally the estimated cost was \$8,300,000, but present costs based on bids, the total would be \$10,525,000. Promised government funds have not been allocated. The city plans to continue to seek federal funds and if these are available new bids will be called.

While rolling mills report ample inventories for present needs, anxiety is expressed over scrap supply later in the year. With consumption high, it is feared there will be a decided shortage as soon as winter sets in. In Seattle a household campaign brought out several thousand tons. Seattle is still dismantling street car tracks and nearly 2500 long tons will be supplied the mills on allocation orders of WPB. This material is sold at the ceiling price of \$16.50 but city engineers estimate the cost of removal at \$75 to \$100 a ton. Federal funds are sought to complete the project. From the dismantled Narrows

bridge about 6500 additional tons of scrap will be realized.

Large steel seagoing barges for United States engineers are being built at Portland by the Steel Tank & Pipe Co., the first unit already launched. The vessels are designed for dry cargo and measure 176 by 45 feet and 12-foot depth.

Cast iron pipe dealers are unable to bid on many projects, stocks being low and deliveries uncertain. There is a fair supply of 4-inch, for which reason some housing projects have been revised to use this size. At Vancouver the authority has brought in a quantity of used steel pipe from Wyoming oil fields, unable to obtain new cast iron. N. Moschetto, Seattle, is low at \$51,932, to federal works agency for a water

system job at Annapolis, Wash., involving 2½ miles of 2 to 8-inch pipe, hydrants and fittings. Award is pending.

Canada . . .

Toronto, Ont.—While labor troubles and disputes still overhang the Canadian steel industry, production has returned to normal following the minor suspension at Sault Ste. Marie. A royal commission is investigating the wage dispute at Dominion Steel & Coal Corp., Sydney, N. S., and Almoga Steel Corp., Sault Ste. Marie. Labor is asking for a basic wage of 55 cents per hour, against the current rate of 43 cents.

There has been some minor abatement in incoming orders for iron and steel,



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Production for Victory is today the prime effort of American industry. To help meet the insistent demands for more production with greater speed we are using every facility we can command. Important to fast service are the many Jessop warehouses, branch offices and sales representatives, strategically located in the principal war production centers. In these stressing times it is not possible to make a blanket promise on steel deliveries—but if you need tool steel, alloy steel or stainless steel, call the nearest Jessop office. There your orders and inquiries will receive immediate and courteous attention.



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but demand on war account is increasing steadily. Further orders directed toward curtailment in use of steel and other metals have been issued through government channels and actual essentials now are being curbed in an effort to wipe out the 500,000-ton shortage of steel reported for this year. Steel mills now are fully booked against production to the end of the year and while some additional business is being accepted, new orders are taken only at the request of the steel controller and special arrangements are made for rolling. Special rollings, however, tend to throw mills off schedule and as a result other consumers have longer to wait for delivery.

Work is proceeding steadily on steel

mill expansion program, but in a number of instances work is being delayed through inability to obtain quick delivery of necessary parts. It is stated that Dominion Steel & Coal Corp., Sydney, N. S., will be a month or more behind schedule in completing its new blast furnace, which was planned to start in November, while Algoma Steel Corp., Sault Ste. Marie, has only started construction of its new 1000-ton blast furnace and work is being retarded through slow delivery of equipment. It is not expected that this stack will be ready to blow in until about the middle of next year. Electric furnace installations at Welland and Hamilton, however, are going forward on schedule, and production from these furnaces will be available

before the end of the year.

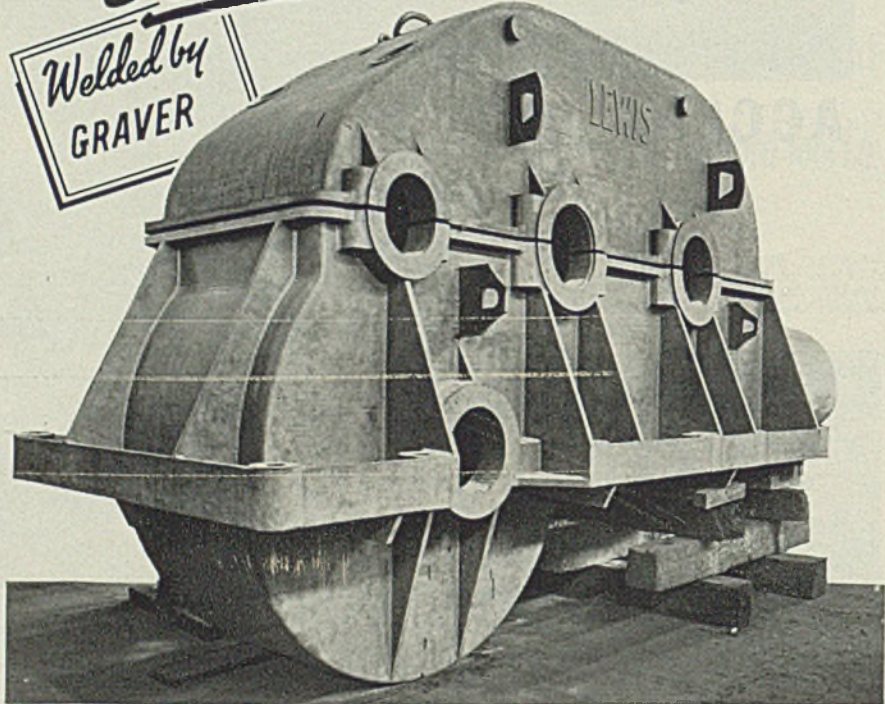
Inquiries for bars are numerous but actual bookings have tapered. Mills are said to be fully booked on bars and in some instances it has been necessary to curtail rolling, due to steel shortages. Numerous orders have been coming through lately not properly made out to government specifications and have been returned for more information. Returning of these orders tends to slow down new placements, but mill representatives do not appear anxious to add much to their present business. Carbon and alloy bars are in specially heavy demand, with delivery dates farther extended.

Demand for wire and other wire products is well in excess of production and even war consumers have difficulty getting delivery. Some wire mills are holding production to high carbon wire. Both steel mills and government officials are endeavoring to hold wire backlogs to a minimum, but inquiries continue to flow in and large orders are overhanging the market.

Pig iron production stepped up during the week and is back to 100 per cent with all 12 blast furnaces blowing. Demand for both foundry and malleable iron has shown improvement lately, due to difficulty in obtaining enough foundry scrap. Sales for the week were about 10,000 tons, about evenly divided between foundry and malleable grades. Basic iron sales dropped to about 500 tons for the week.

Scrap iron and steel offerings are increasing in volume with larger receipts reported from the rural districts. Scrap salvage campaigns are to be given another lift and special appeals have been made by the steel controller to make all possible scrap available before winter. Special attention is to be given to the mining fields of northern Ontario and Quebec to bring out scrap from the hundreds of dormant properties that will not open again until after the war. It is estimated that many thousands of tons of scrap can be obtained from these old mining properties. Demand for both steel and iron scrap is brisk and all supplies are being quickly absorbed.

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Boston—Outstanding prime contracts being placed for war needs, include those for small tools totaling several million dollars: twist drills, bolts and screw threading sets, reamers, countersinks, chisels, bolt and screw die stocks, threading taps, adjustable pipe dies, and many thousand wrenches of all types. While these contracts are widely spread several large awards for the navy went to shops at New Bedford, Mass., Greenfield, Mass., and Torrington, Conn., including one for twist drills, \$160,184.98, and another for bolt and screw threading sets, \$307,157.97. A Cleveland shop took one contract for twist drills at \$256,012.11. The Greenfield shop also took a large order for bolt and screw die stocks. Navy purchases of these tools, direct and indirect, have been unusually heavy and supplement a strong demand from district procurement offices, both army and navy, and large purchases by private shops converted to war production as well as normal large consumers, also stepped up on government work. Many repair shops at depots are also buying heavily.