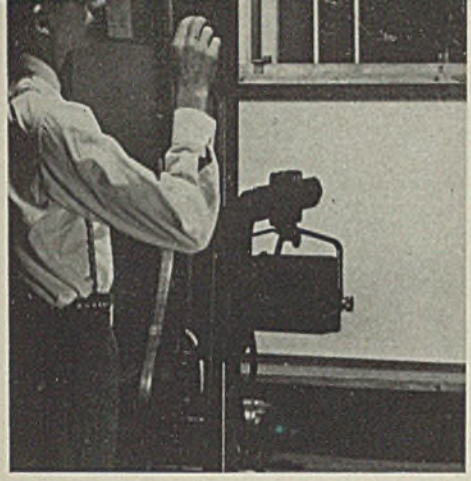

X-ray photography is skillfully used to break bottlenecks in template duplication for aircraft, p. 70

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HERE'S WHY *Scrap* IS SO IMPORTANT!

SCRAP iron or steel turnings, clippings, short ends, worn out or broken tools, spoiled work, idle and obsolete machinery, etc., are valuable as raw materials for remelting in the production of new steel.

Through previous refining, ingredients undesirable in steel have been reduced—thus the use of properly prepared scrap speeds the refining process and enables new steels to be produced more rapidly. Recapture of scrap—from your plant—means opportunity to save time and labor—hence more steel.

Certain scrap contains valuable alloying elements such as nickel, molybdenum, tungsten, etc. which can and must be recovered to augment primary supply to meet tremendously increased demand for constructional and high speed alloy steels for more planes, tanks, guns, ships, tools and machinery essential to the war effort.

To be of maximum immediate assistance, scrap should be segregated by composition wherever possible. Turnings, spoiled work etc. should be identified (SAE, AISI, NE etc. grade number) at the machine where they are generated and so handled as to avoid contamination by waste material or scrap of other types and grades.

The metallurgical experience of our staff is available to aid you in technical phases of metal salvage.

KEEP SCRAP MOVING INTO WAR PRODUCTION!

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK, N. Y.

HIGHLIGHTING

this issue of STEEL

PRODUCTION For the first time since February monthly pig iron production statistics may be published as a result of rescinding of a censorship ban. October output was 5,165,012 net tons, that of the first ten months of this year 49,133,042.

Steel production again rose half a point last week, to 99½ per cent of ingot capacity (p. 35).

Production for war has reached the level requested by Donald M. Nelson when last February he pointed out that the outcome of the war depended on what industry did "in the ten silver months ahead" (p. 32). While the tooling up period is approaching a peak, numerous contracts involving new war plants continue to be placed by the Defense Plant Corp. (p. 58).

C. D. Howe, Canadian minister of Munitions and Supply, has been made a full member of the Combined Production and Resources Board, a move that will mesh Canadian production activities even more closely with our own (p. 57). The Vickers 5-inch naval machine gun has been placed in production in Canada.

DORMANT SCRAP Manufacturers are urged to intensify their efforts in locating dormant industrial scrap; they should follow a procedure recommended by the Industrial Salvage Section (p. 42). "Get a scrap salvage manager and give him authority to act," councils D. W. Gee (p. 72). L. C. Reed points out that not only is this scrap needed to support steel production but the manufacturer who scraps idle equipment will derive tax benefits and also be in a position to obtain equipment of latest design after the war emergency is over (p. 37).

PRICES Companies selling military items should determine whether their sales are subject to regulations of the Office of Price Administration or of the Army and Navy (p. 47).

Higher than ceiling prices are allowed in some cases on special "trade name" brass and bronze ingots. Used machine dealers must register with OPA.

MATERIALS Field representatives of the War Production Board are taking special training at Washington so as to be able to answer questions about the Controlled Materials Plan which are presented at regional and branch offices of the board (p. 41). Harold K. Howe believes the new CMP will work well for large consumers but he fears that smaller companies are due to encounter difficult procurement problems (p. 36).

Trained men who know steel products, their use, and how they are distributed are needed to man the staff of the new Steel Recovery Program at Pittsburgh (p. 42). It is expected they will complete their work there in the next three or four months.

The Navy will use more commercial bronze castings to save copper (p. 39). Restrictions on deliveries of tungsten ores have been liberalized (p. 46).

COMMITTEES The War Production Board has appointed advisory committees covering steel products, resistance welding electrodes, resistance welding machines, ferrosilicon, silvery iron, construction machinery, fractional horsepower motors, commercial dish washing machines, molybdenum and tungsten wire and rods (pp. 41 and 46).

OF INTEREST War Manpower Commission has certified the production of transportation equipment as an essential war industry (p. 43).

A hacksaw manufacturer reports he sells through distributors at much lower cost than if he were to organize his own sales staff (p. 64).

Responding to the government's call for typewriters, one company made a study which led to the revelation that it could get along with 38 per cent fewer machines than it previously had considered necessary They have been turned over to the armed forces. Other companies are urged to release typewriters to the maximum extent (p. 42).

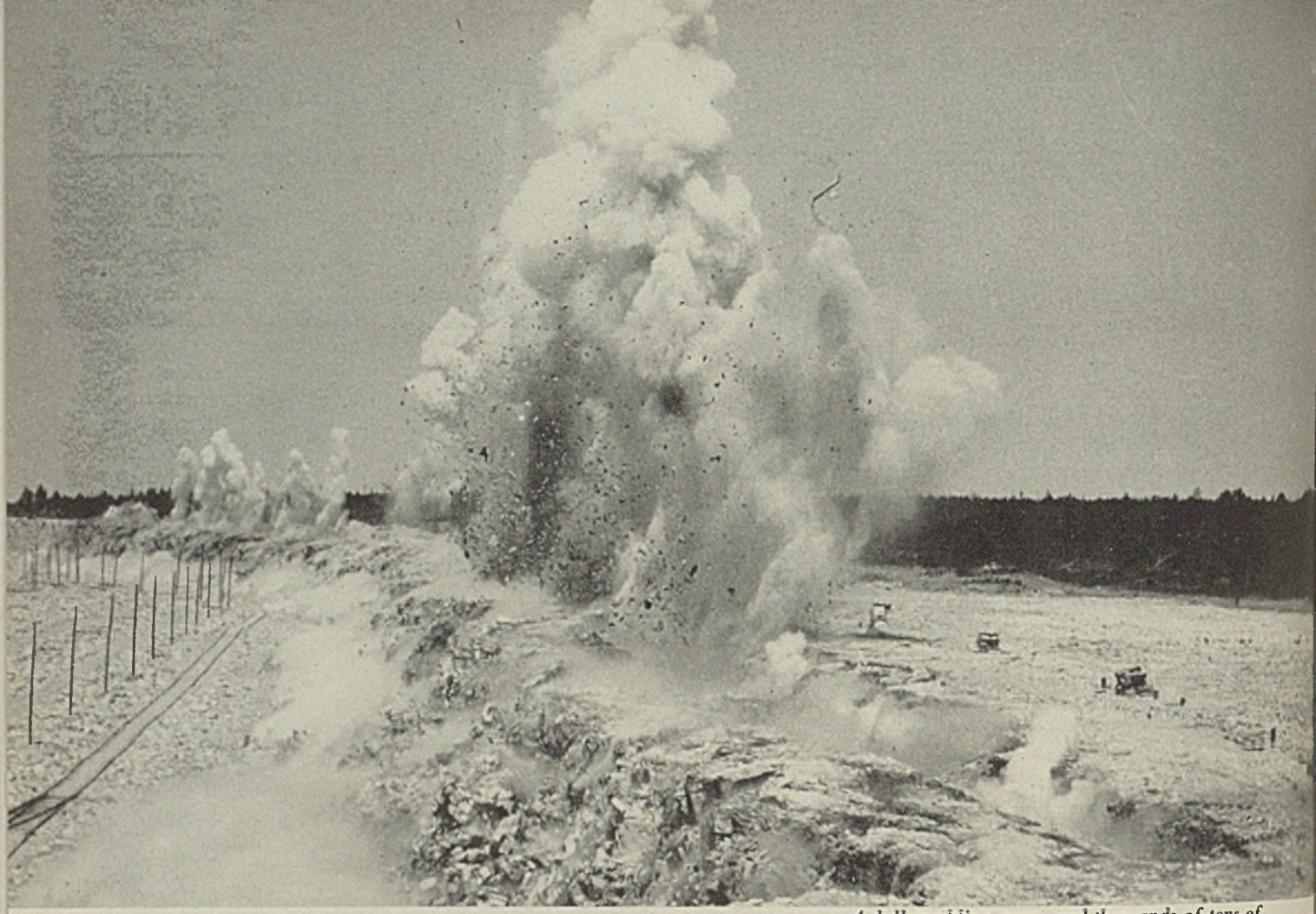
TECHNICAL A template-making shortcut described by Gerald E. Stedman (p. 70) employs an X-ray activated material which prints from negative to positive plates by phosphorescence. Direct contact printing retains precise dimensions of original.

George R. Reiss tells how an auto dealer became a successful army subcontractor fabricating such tank components as armor plate sections (p. 78), one of the toughest and most exacting war production jobs.

Automatic spray painting at the Martin bomber plant triples production, frees 10 men for more important work (p. 82). Unit is specially designed to handle aircraft work.

R. J. Zemanek concludes his discussion of the use of amorphous graphite in the open hearth (p. 86).

G. C. Riegel presents a report of Caterpillar Tractor Co.'s experience with over 60 heats of NE steels (p. 90). This company has found many of these analyses satisfactory substitutes for such steels as SAE 3115, 3130, 3140, 3240, 4615, 4620, 4130, 4820, 4150. . .The latest revised listing of the NE steels appears on p. 96.



A dull rumbling roar—and thousands of tons of limestone are blasted free, ready for the crusher.

Blasting for Steel

Pure Inland Limestone Helps Produce Steel for War

Twice each month 14 tons of dynamite blast loose 150,000 tons of limestone at the Inland quarry. This is the equivalent of a block of stone half a mile long, 30 feet wide, and 30 feet deep. Immediately following each blast, giant power shovels move in to pick up the limestone and load it for transport to the modern preparation plant. Inland freighters then carry it to the mills at Indiana Harbor.

Quarrying limestone seems far remote from steelmaking. Actually it is one of Inland's vital war jobs, for the Inland quarry furnishes pure limestone so essential to the making of fine steel. This limestone quarry is only one of many Inland-controlled sources of raw materials. Inland also operates its own ore mines in the northern ranges, and coal mines in Kentucky.

Complete control of raw materials is one of the most important factors in making steel of highest quality, at maximum output, to help win this war of production.

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

Dedicated to Victory

INLAND STEEL CO.

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

STEEL
November 23, 1942

Ingenuity and Manpower

In spite of all one hears about the seriousness of the manpower problem and in spite of the fact the daily newspapers are crowded with want ads for skilled industrial workers, one seldom finds a clear-cut case of acute labor shortage in the metalworking industries.

This does not mean that industrial employers are satisfied with the employes now on the job. Nine out of ten manufacturers could use experienced hands if they could get them. That is why they use the want ad columns so persistently. But long ago most industrial employers resigned themselves to getting along with "makeshift" labor. Consequently, when they couldn't hire skilled workmen, they took on novices and trained and adapted them to the job.

The ingenuity which industrial management has displayed in maintaining a high rate of production with working forces consisting of a high percentage of newly recruited, inexperienced workers has been an important factor in industry's success to date in averting a critical labor shortage. If, as seems probable, the manpower situation is to get worse before it gets better, then industry must go even farther than it has in the effective utilization of inexperienced personnel.

Two courses are open. One is to continue and to extend the effort to utilize former bank tellers, store clerks, and other men and women from less-essential occupations. Every day an employer somewhere is discovering a better way to infiltrate this type of worker into the industrial picture. The possibilities in this field have not been exhausted. New expedients, such as the half-shift, may be worth trying.

The other course is to encourage the development of "short cuts." The first two reports of the suggestions offered by workers through the WPB's labor-management committees provide a most gratifying commentary on American ingenuity. Thousands of workers have come through with ideas which cut production time, improve the product or save machine- or man-hours.

Ingenuity can ease the manpower problem.

E. L. Shaner

Editor-in-Chief

"Ten Silver Months" Mirror Nation's Striking Power

Winning the battle of production, in critical 1942, prelude to military victories in Africa and Pacific. New output records for iron, steel and other metalworking industries

"THE YEAR 1942 is the critical year. We have ten silver months in which to hold the enemy."

This was the appraisal of the war production picture by WPB Chairman Donald M. Nelson last February in emphasizing the gravity of the *materiel* situation.

It now can be recalled with satisfaction—but not complacence—by industrialists whose plants' output have made possible the encouraging double-barrel military victories in Africa and the South Pacific.

In the "ten silver months" America has gone far in winning the battle of production. In munitions output, it has passed the "end of the beginning."

Overall production of ships, planes, tanks, guns, ammunition and all field equipment has been quadrupled since Pearl Harbor—a notable achievement despite the pessimism and carping criticism expressed in many quarters.

In each month for which the WPB has reported there has been an overall gain. In the early months, an unbalance was noted, as could be expected. More recent figures show a greater evenness of distribution, both in the production of finished munitions and in the raw materials required to make those munitions.

Many Figures Secret

Many figures on munitions production must, of course, continue to be military secrets. Enough, however, can be revealed to indicate the success that is being achieved. Witness the increase in Lend-Lease aid to other United Nations in October to $915,000,000; the launching of merchant vessels at the rate of three a day and of naval vessels at a rate of more than one every three days. Note the news accounts of the latest model American tanks in service on foreign soil, and of the armadas of American-built bombers and fighter planes inflicting punishment on German and Japanese-held territory.

Outstanding in this production picture have been the steel and metalworking industries. At the beginning of the year, the steel industry had taken stock of itself and found it had two major problems:

1. Efficient distribution of the tonnage produced.

2. Development of sufficient pig iron capacity and collection of enough scrap to utilize its capacity to the maximum.

The results: Steel ingot production for the first ten months totaled 71,604,470 tons, an increase of 4.5 per cent over the comparable 1941 period, and establishing a new record.

Pig iron production was up 7.5 per cent over 1941 and also at a new high.

Iron ore shipments advanced 17 per cent over 1941, and are expected to reach 92,000,000 tons for the season.

For the first three quarters, steel output averaged 96.4 per cent of capacity, despite a shortage of scrap that at times forced open-hearth furnaces to suspend. Last month, operations slightly exceeded rated capacity at 100.1 per cent.

The recent improvement in steelworks operations, and in steel supply, has been due in large part to the scrap collection campaigns. While the success of these salvage drives must be attributed to many elements of the population, the steel industry contributed a great impetus by sponsoring a $1,500,000 advertising campaign during the summer and fall and individual companies further contributed by their own advertising campaigns.

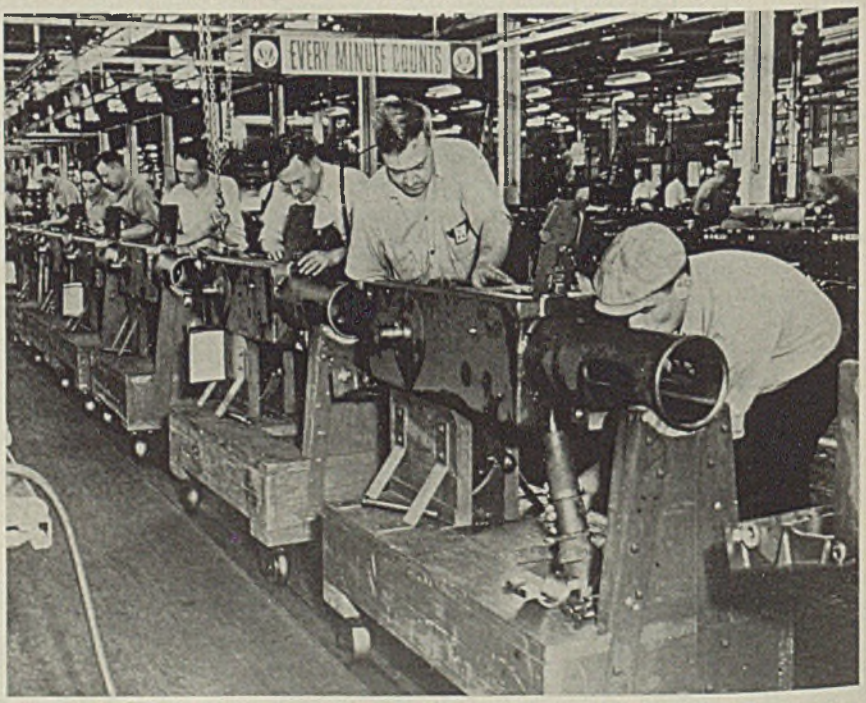
Steel producing capacity figures indicate the United States and the United Nations may expect a continued advantage in the matter of steel supply. The United Nations are estimated to have annual capacity for nearly 131,000,000 tons of ingots, nearly 89,000,000 tons of which is in the United States.

The Axis powers, on the other hand, have only 61,000,000 tons of capacity, of which 53,800,000 tons are in Europe and 7,200,000 tons in Japan. At current production rates, America produces more in a month than Japan's annual capacity.

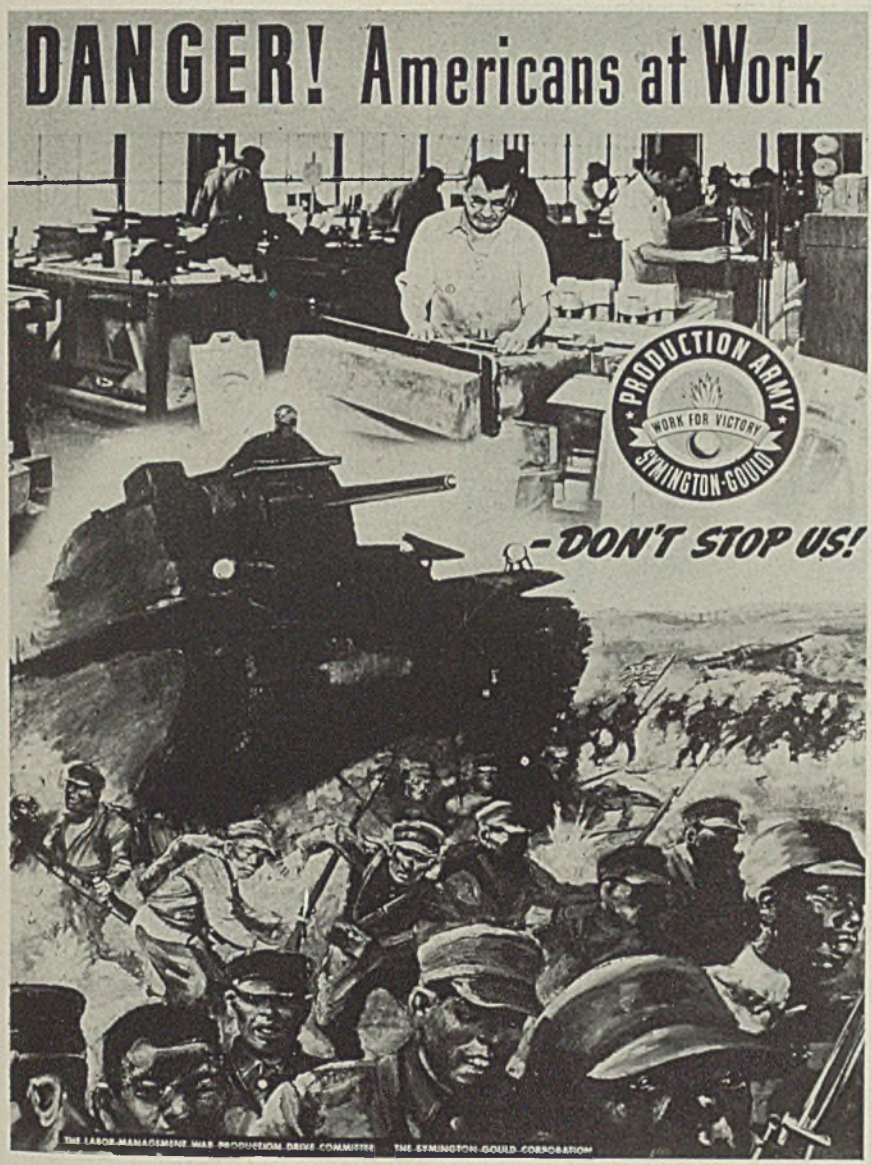
Nonferrous Capacity Expanded

Aluminum and magnesium producers have increased capacity to an extent that would have been considered fantastic several years ago. Copper, lead, zinc and other nonferrous metals production has been lifted, often with the aid of government-financing agencies.

To make the supply of metals stretch



Units of 40-millimeter antiaircraft gun mechanisms are assembled on dollies in a Chrysler Corp. plant. On the assembly line, 5472 pieces and subassemblies are added



Symbolic of American industry's war effort is this poster sponsored by the labor-management committee at Symington-Gould Corp., Rochester, N. Y., tying in the production line and the battle lines. NEA photo

even further, industry, in co-operation with the war agencies, devised many conservation measures, most notable of which, perhaps, were the National Emergency steels, requiring less of the critical alloying elements. In one instance, the alloy steel committee of the American Iron and Steel Institute created a whole new series of NE steels in ten days, at request of the War Production Board. This feat was the more astounding because it was required that the new steels should be made entirely from scrap and could be used in place of other alloys without changes in designs of parts.

Even more impressive than the gains in the production of metals has been the conversion of peacetime industries to the job of utilizing these metals in producing materials for direct use by the armed services.

Durable civilian goods plants in October were estimated to have been 91 per cent converted to production of war goods.

Most gigantic conversion job was that by the automotive industry. Changing over from the manufacture of pleasure vehicles to the production of tanks, guns, shells, aircraft and engines, the industry in the first ten months this year shipped $3,500,000,000 of war material and now is producing at a rate 50 per cent in excess of its peacetime peak.

Credit also must go to the machine tool industry which is doubling last year's output and is headed for a $1,500,000,000 year, 68 times the value of its output ten years ago.

Gearmakers have increased output 35 per cent over 1941.

And so on down the line of metal-working industries, normally geared to the production only of peacetime articles, have increases been made, increases which cannot be recorded because of censorship, but increases which prompted Mr. Nelson recently to say that the battle of production was being whipped.

The story of the "ten silver months" cannot be complete without noting changes in management and labor relationships—some good, some questionable.

Early in the production drive, Mr. Nelson called for the establishment of joint labor-management committees to speed war output. To date, these have been organized in some 1600 plants, mines and railroads, and have been responsible for numerous production shortcuts and other improvements. These committees, which existed in many plants before the war, probably will be widely retained after the conflict ends.

On the darker side of the picture has been the imposition of compulsory dues-paying union membership on many workers by edict of the National War Labor Board. Through its "maintenance of union membership" and check-off orders, the board, in effect, has used the war emergency to enforce the demands of union leaders.

Shortly after the "ten silver months" broadcast last spring, a high official of the war production organization said—off the record—to newsmen:

"The war will be won or lost this year."

This was interpreted to mean that the months would soon demonstrate a will to win; or develop a defeatist complex, a losing laziness.

In these "ten silver months", examined from the industrial, or any other angle, there has been generated a tremendous striking power, creating so much confidence that the chief danger now appears to be a relapse into over-confidence.

This, industry declares, shall not occur; "for us the war has just begun."

Record Not Good Enough, Says Grace

CALLING present peak production "not good enough", E. G. Grace, president, Bethlehem Steel Co., urged still higher goals, in a message to employes issued last week, while two new open hearths on the Pacific Coast added 100,000 tons of steel ingots to the company's annual capacity.

"We can't afford to be complacent be-

American-built high-explosive missiles are loaded by Marines in a Guadalcanal "bomb garden", preparatory to attacks on Japanese forces. The bombs are concealed in palm trees. NEA photo

cause we beat schedules by weeks or months," said Mr. Grace. "We have recently had reports of many actions which show what our armed forces can do if they have the proper equipment . . . the issue might be decided by a narrow margin of equipment at a certain place, at a certain time."

Stating that there are 18,000 Bethlehem employes now in the fighting services, as well as many thousands of kinfolk, he urged Bethlehem workers on their part "to see that our armed forces get, promptly and in abundance, the tools they need for the job."

Numerous peak records by the company are cited in the current issue of Bethlehem *Review*. Bethlehem Steel, it points out:

"Has greatest combined naval and merchant shipbuilding program ever undertaken by one organization.

"Is nation's largest producer of heavy ordnance, including gun forgings, forged armor plate, shells, bombs, projectiles, etc.

"Broke its own steel ingot record in October with 1,100,000 tons.

"Blast Furnace 'H' at Lackawanna plant set a new world's record in pig iron production—46,246 tons."

Showing how a war industry works, the bulletin gives procedures on fire prevention, air raid instructions, safety rules, training programs, War Bond sales, scrap collection and war production committees.

Credit is given to the press and the American public for the success of the scrap drive. While stating that "the immediate threat to our production has been overcome," Mr. Grace added, "the situation will continue to be serious . . . I hope the scrap campaign will continue with unabated vigor."

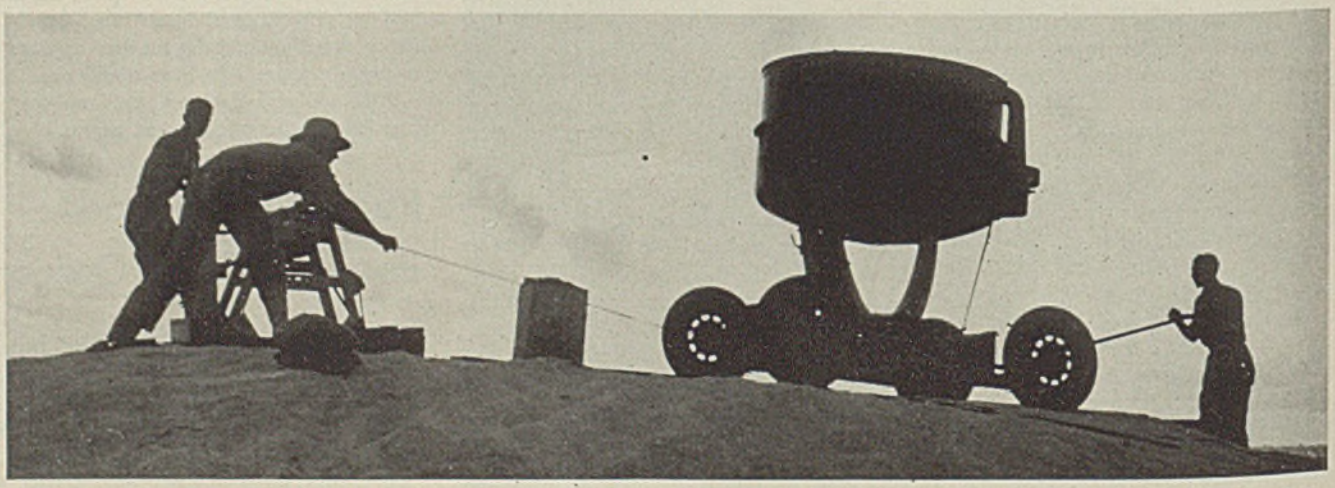
Bethlehem has adopted an unusual procedure by carrying full page newspaper advertisements of the Bethlehem *Review*, summarizing it and inviting the public to write in for free copies. The advertising list includes newspapers in communities in which the company has major steel and shipyard operations. This is believed to be the first time that an industrial bulletin for employes has been brought to public attention by a national advertising campaign.

Pig Iron Output 7.5% Above 1941

PIG IRON production in the first ten months this year, 49,665,163 net tons, exceeded full 12 months' output for all prior years except 1941. It was about 7.5 per cent greater than in the corresponding months in 1941.

October output, 5,236,608 tons, was larger than for any prior month in history, and 8 per cent above tonnage in October, 1941.

Figures from the American Iron and Steel Institute, New York, passed by the Office of Censorship, are the first relating to pig iron to be released since February. While pig iron production figures were suspended, statistics on steel ingot output, iron ore shipments and con-



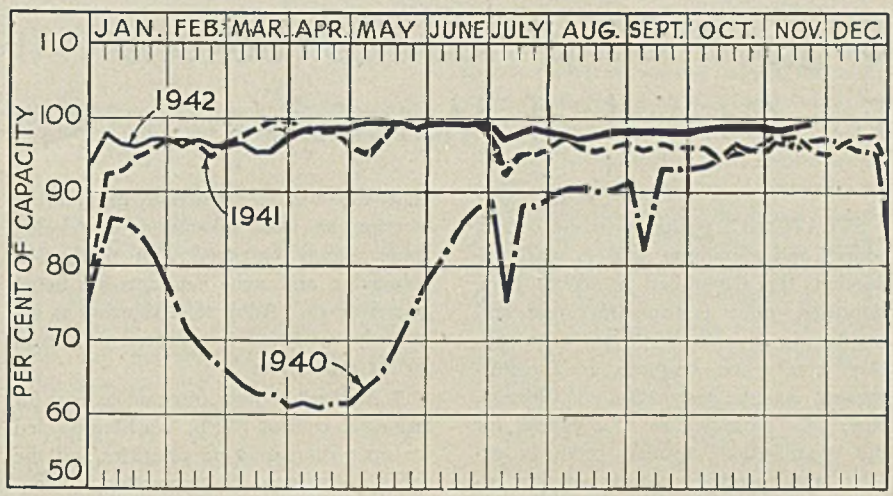
Searchlight silhouette on Midway Island: Huge light is pulled into position on planks because the station is located on sands near the beach. Instruments like this aid American Marines and soldiers combat Jap air raids. NEA photo

DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week ended Nov. 21	Change	Same week 1941	Same week 1940
Pittsburgh	98	None	99	97
Chicago	102	+0.5	101.5	100
Eastern Pa.	96	None	91	94
Youngstown	97	None	92	93
Wheeling	86.5	+3.5	82	93.5
Cleveland	95	+2	92	86
Buffalo	90.5	None	79	93
Birmingham	95	+6	90	97
New England	100	+10	92	82
Cincinnati	91	None	91.5	97.5
St. Louis	94	None	98	87.5
Detroit	94	—2	96	96
Average	99.5	+0.5	°95.5	°97

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



STEEL . . . . . UP

PRODUCTION of open-hearth, bessemer and electric furnace ingots last week rose ½-point to 99½ per cent. Five districts advanced, one declined and six were unchanged. A year ago the rate was 95½ per cent; two years ago it was 97 per cent, based on capacity as of those dates.

Central eastern seaboard—Unchanged at 96 per cent, which has been held for nine weeks.

St. Louis — Held at 94 per cent, with the same schedule for this week.

Buffalo — Four open hearths were still under repair and production continued at 90½ per cent for the third week.

Chicago — Advanced ½-point to 102 per cent, on sufficient scrap supply. Open hearths idle under repair prevent a higher rate.

Detroit — Dropped 2 points to 94 per cent because of open hearth repairs.

Pittsburgh — Continued at 98 per cent of capacity for the third week.

Wheeling — Gained 3½ points to 86½ per cent.

Cleveland — Completion of repairs by two interests caused a rise of 2 points to 95 per cent.

Youngstown, O. — With three bessemers and 77 open hearths in operation production continued at 97 per cent, with schedule for this week at the same rate.

Cincinnati — Steady at 91 per cent, with two open hearths idle.

Birmingham, Ala. — Relighting of an open hearth by Republic Steel Corp. increased production 6 points to 95 per cent after two weeks at 89 per cent.

New England — Completion of repairs has placed all open hearths in operation, the rate advancing 10 points to 100 per cent.

Workman's Wartime Pledge, To Conserve Time, Tools

An "American Workman's Wartime Pledge" card has been published by Koebel Diamond Tool Co., Detroit, as part of a program of tool conservation.

Every worker who accepts a card agrees that: "As a soldier in our mighty production army, upon whose skill and unstinting labor the lives of millions and the freedom of all depend, I pledge that I will take care of my tools and machines; I will help and instruct my fellow workmen whenever I am able; I will waste neither time nor materials, to the end that all of America's productive resources may be dedicated to final and complete victory; I will do my best!"

sumption, and scrap consumption have been issued each month.

Pig iron has shown a relatively larger increase so far this year than steel ingot production. Ten months' ingot output represents a gain of 4.5 per cent over the 1941 period, in contrast with 7.5 per cent for pig iron.

Average blast furnace operation for ten months was 98.7 per cent against slightly under 97 per cent for steel ingots. October blast furnace operation was at 101.6 per cent, compared with 100.1 per cent for steel ingots.

The Cleveland-Detroit district has the best relative record so far this year in pig iron operations, averaging 101.4 per cent of capacity. It is followed closely by the Pittsburgh-Youngstown area with 99.9 per cent. However, while the western district had the lowest ten-month average with 91.1 per cent, its October showing was the best for any section with 111.8 per cent.

Annual blast furnace capacity is placed at 60,682,080 net tons. Pittsburgh and Youngstown interests account for practically 40 per cent of this total, followed by the Chicago district with about 21 per cent and the Eastern area with slightly under 20 per cent. Capacity of the growing industry in the West still is less than 2 per cent of the total.

PIG IRON PRODUCTION FOR OCTOBER AND TEN MONTHS

Districts	Number of companies	Annual blast furnace capacity	Production — Pig Iron — October	Pig Iron — Year to date	Ferromanganese and spiegel — October	Ferromanganese and spiegel — Year to date	Total — October	Total — Year to date	Percent of capacity — October	Percent of capacity — Year to date
Eastern	11	11,967,680	972,602	9,321,700	16,983	193,054	989,585	9,514,754	97.3	96.3
Pittsburgh-Youngstown	15	24,346,420	2,132,200	20,059,967	29,066	194,033	2,161,266	20,254,000	104.5	99.9
Cleveland-Detroit	9	6,068,470	562,980	5,097,568			562,980	5,097,568	109.2	101.4
Chicago	6	12,954,800	1,059,878	10,556,574	13,881	45,216	1,073,759	10,601,790	97.6	98.4
Southern	7	4,521,910	359,165	3,410,093	11,666	95,629	370,831	3,505,722	96.5	96.4
Western	2	822,800	78,187	687,140		4,189	78,187	691,329	111.8	91.1
Total	36	60,682,080	5,165,012	49,133,042	71,596	532,121	5,236,608	49,665,163	101.6	98.7

During 1941 the companies included above represented 99.8% of the total blast furnace production. Above figures, in net tons, reported by American Iron and Steel Institute.

Suggest Simplified Instructions For Control of Materials

CHICAGO

STRATEGIC positions which steel, copper and aluminum hold in war production, the Controlled Materials Plan, priorities, price control, rationing and Lend-Lease, were topics in the "Ordnance Day" conference conducted by the Purchasing Agents Association of Chicago, Nov. 17. Arranged as a substitute for the organization's annual products exhibit, the meeting proved popular, attracting an attendance of over 1000.

The subject of steel and priorities was introduced by Harold K. Howe, manager, Washington office, LaSalle Steel Co., who asserted that the new Controlled Materials Plan should work well with large companies and prime contractors for war goods, but smaller companies may encounter many problems. Chief among these likely will be the inability to obtain supplies from regular sources.

Mr. Howe said that the 58-page booklet which WPB has issued on the CMP is excellent from the government's point of view, but he suggested a rewritten version be prepared from the user's perspective. This should contain simplified, but detailed instructions.

In concluding, Mr. Howe stated that he expects an easier situation in steel within six months. Among reasons are that the war construction program is nearing an end, inventories are being more closely balanced with production schedules, and some contracts are being pared down. Alloy steel demand is extremely tight and is expected to remain so for some time.

J. A. Krug, deputy director general for priorities control, WPB, Washington, led an open discussion on priorities and the CMP. By way of explanation, he declared that under the end products system now in use it has been impossible to keep all items going into a finished product balanced.

Success Depends on Co-operation

Purpose of CMP, consequently, is to correct defects of the previous plan. It is based on the supply of steel, copper and aluminum, and will balance requirements to match. Mr. Krug emphasized that the plan must be made to work and its success hinges not only on co-operation between industry and government, but co-operation between branches of the government as well.

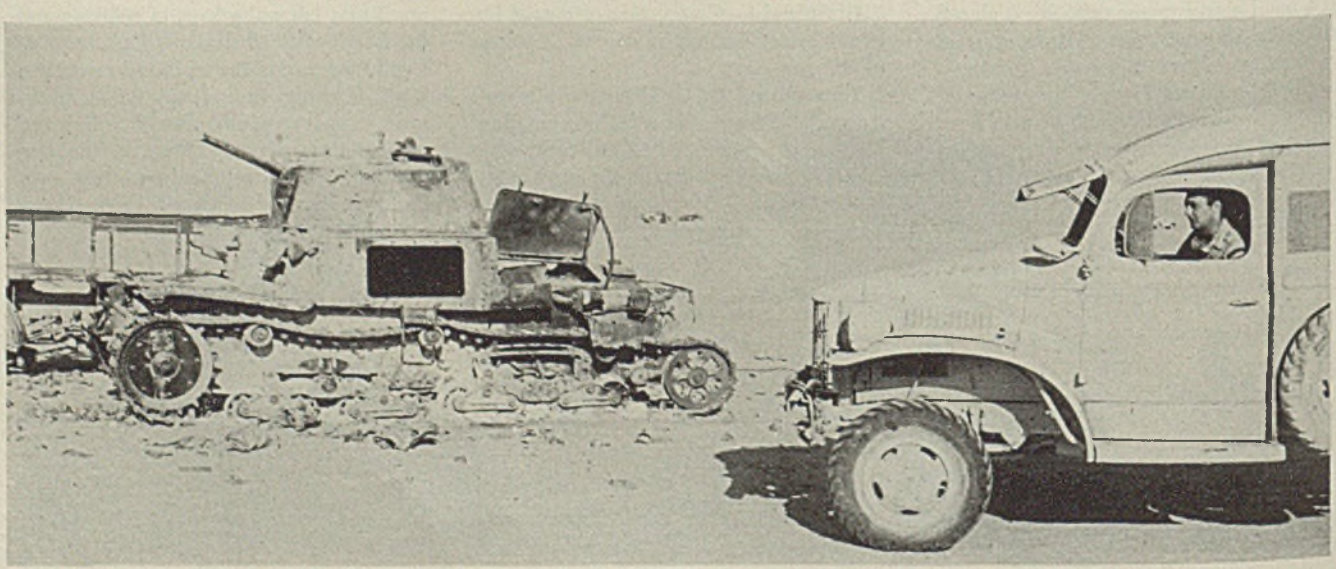
Products listed as Class B in the plan, are there, Mr. Krug said, solely because no practical way has been found to assure a manufacturer getting his full requirements of the products named. Under CMP itself no priority ratings will be used, an allotment number being assigned instead. However, each manufacturer or war goods producer will have a rating from WPB on the work he is doing, and this rating will be used to obtain other materials or parts needed.

Objectives and functions of the Copper Recovery Corp. were explained by L. P. Frances, assistant chief, recovery program, Materials Redistribution Branch, Washington. This organization seeks to locate and redistribute idle, excess or frozen stocks of copper and brass products. To reduce freight cross-hauling, geographical location is carefully considered in redistribution.

The Lend-Lease program will stand as "the greatest step forward at one time in international good will," and may facilitate co-operation among nations after the war, declared Maj. Gen. Charles M. Wesson, assistant to the Lend-Lease Administrator, Washington, in an address at the banquet.

Addressing the opening luncheon, I. M. Sieff, chief consultant and counsel, OPA, Washington, and a widely-known British merchant, described price control and rationing in Britain. Since the war began, British wholesale prices have risen 60 per cent and the cost of living 30 per cent, half of which was experienced in the first three months following hostilities and before controls were established. Since then the rise has slowed markedly, and so far in 1942 price advances have been negligible.

DEMOLISHED GERMAN TANK DESERTED ON SANDS OF EGYPT



SMASHED tank abandoned by the Africa Korps in its flight from Egypt attests silently to the haste of the retreat.

Pictured driving by in an ambulance is one of the American Field Service volunteers. NEA photo

Lists Reasons Why Unused Materials, Equipment Should Be Scrapped Now

REASONS why industrial plants should move unused or obsolete equipment and materials into scrap were outlined last week by L. C. Reed, Inland Steel Co., and Chicago regional director of the iron and steel industrial salvage campaign.

In addition to the benefits of increased iron and steel scrap collections, these included:

Possible tax advantages.

Being in a position to start the post-war period of commercial activity with up-to-the-minute equipment of latest improvements and design. Manufacturers could use this equipment to impress the trade that a more perfect product, more true to dimensions and more accurately formed, would be offered.

Mr. Reed quoted the following United States Treasury announcement regarding tax advantages:

"When through some change in business conditions the usefulness in the business of some or all of the capital assets, such as machine tools, is suddenly terminated, so that such assets are permanently discarded by a taxpayer from use in such business, the taxpayer may claim a deduction in his federal income tax returns as a loss for the year in which such action is taken for the difference between the adjusted basis and the salvage value of the property."

This indicates the following possibilities:

1. When the material to be scrapped has not been fully depreciated on the books, full depreciation can be taken at this time, and this amount less salvage value may be deducted as a loss in the tax return. This would thus operate a diminution of top bracket taxes.

2. If the material to be scrapped is considered to be entirely depreciated on the books, one of two results would obtain, depending upon the accounting methods used:

(a) If the item is depreciated down to salvage value, which is still carried on the books, the scrapping of the material merely eliminates this item from the books, showing neither profit nor loss to be reckoned as far as taxes are concerned. There thus being no change either way in the tax status, there would appear no reason for not helping the war effort, and the material should be willingly scrapped.

(b) If the material is fully depreciated on the books the amount as scrapped is thrown into the profit and loss account and becomes a small profit. This small profit would appear as an insignificant tax item and the larger advantage of moving these old materials now and helping the war effort should easily outweigh this small tax item.

In many companies, Mr. Reed pointed out, there are accumulations of old equipment and materials which have been stored away for possible use sometime, but which probably will not be used until after the war, if then. It may be the present value of these materials is much less than the cost of the floor space they occupy, particularly if they have been so held for a long period of time. This is really an actual loss on the books, although it may not so readily appear. Under such a condition it would be advantageous to move this material

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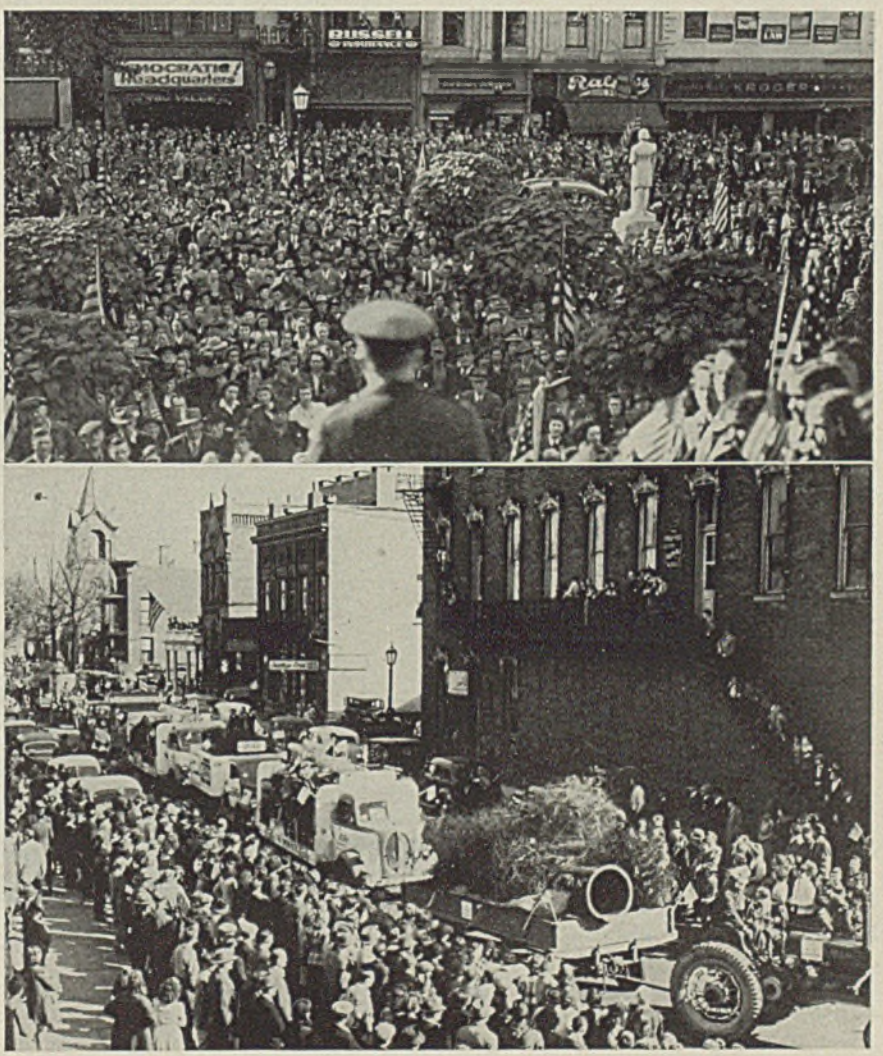
PUBLIC CEREMONY TOPS THE SCRAPPERS' CAMPAIGN

Culminating a four-weeks drive by the Scrappers, a volunteer organization of employes of National Machinery Co., Tiffin, O., a patriotic parade and program were staged on a Sunday afternoon recently, to transport scrap to dealers' yards for sorting.

The material had been accumulating on the factory athletic field, which had been converted into a temporary scrap yard. The Scrappers worked night and day and "delivered" an average of 1850 pounds per workman. One-hundred, twenty-eight trucks were required to move it to the local yards, adding at least 475 tons of scrap to the city total.

The parade included many civic and patriotic organizations. The groups assembled in Courthouse Square where a brief ceremony was conducted under the sponsorship of the American Legion.



into salvage or scrap, thus stopping this continuous loss and put the space to more profitable use.

120 Tons Scrap Requisitioned At Old Michigan Foundry

An estimated 120 tons of iron and steel scrap was requisitioned in Houghton, Mich., Nov. 17, by the War Production Board at the old Carroll Steel Foundry Co. Included in the company's yard on Portage Lake was a large obsolete lathe, said to have been used to turn the turret for the famous union ironclad, MONITOR, which fought the Confederate ironclad, MERRIMAC, in Hampton Roads during the Civil War in 1862.

The requisition, authorized by William McCaw, chief of the requisition section, Materials Redistribution Branch of WPB in Washington, was served on receivers of the Carroll company by United States Marshal Dewey L. Hanson of Marquette.

According to WPB officials, the company has not operated for more than ten years. Its main building was torn down several years ago. The company had been asked on numerous occasions to sell the material but refused to do so. After investigating the case for several months, WPB urged the sale of the obsolete equipment as scrap at ceiling prices. When this request was denied, requisitioning was started.

No Furnaces Down for Lack of Material

Scrap allocation is in good shape, WPB reports, and at the present time so far as is known no mills are shut down for lack of material.

While WPB wants the scrap campaigns to continue as strenuously as ever, their feeling is that if the situation continues as at present there will be no scrap shortage this winter. They state household scrap recently collected is not so good for furnace charges, but declare that after it is segregated and hundled, it is better than none.

Control Over Tin Can Collections Tightened

Tighter control over collection of scrap tin cans will be exercised as a result of an official interpretation of Supplementary Order M-72-a.

The order permits persons who have received authorization from WPB to collect cans, and if the collector is a bottler of beverages he may retain for his own use 50 per cent of the cans of size No. 10 and larger for use in making bottle caps. About 10 per cent of the tonnage of all cans are No. 10 size or larger, so even if all cans were so collected, the amount used for bottle tops would be considerably less than 5 per cent. Actually, the percentage is even smaller, since Army camps, Naval stations and many institutions send their cans direct to detinners. All smaller cans collected must be turned in as scrap to local salvage committees or detinning plants. This system was established to permit operators of truck routes in inaccessible territories to serve as collection agents under local salvage committees to collect cans that would not otherwise be collected.

The interpretation states that a person authorized to collect cans may not collect any tin scrap other than cans from which the contents have been removed. Since he is not authorized to collect any flat sheets made from cans or other tin scrap, he must process the No. 10 or larger cans himself or through his agents if he wishes to use them in making bottle caps.

Cleveland Steel Salesmen Plan Winter Scrap Drive

Cleveland steel sales executives met on Nov. 12 with John Deibel, regional chief of the Industrial Salvage Section of the War Production Board, and W. L. Seelbach, head of the industrial division of the mayor's salvage committee, to discuss plans for industrial salvage throughout the winter.

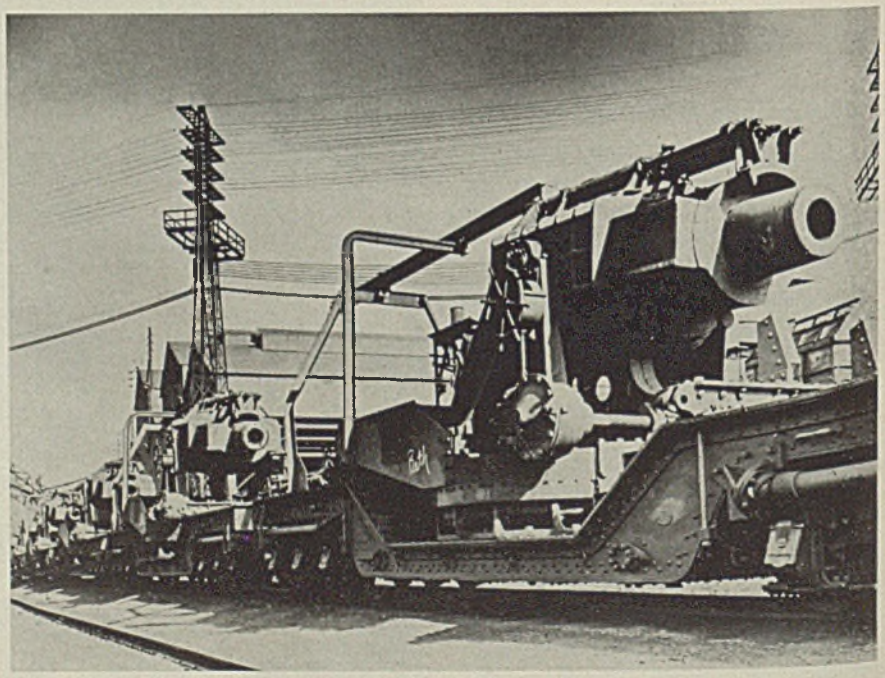
Joining steel salesmen the country over who have volunteered to aid WPB in getting out industrial scrap, 124 salesmen in 19 counties in northern Ohio have completed first calls on more than 1400 plants.

This group serves under an executive committee consisting of P. B. Gilroy, manager of sales, American Steel & Wire Co., chairman; W. P. Andrews, Carnegie-Illinois Steel Corp.; W. E. Collier, Republic Steel Corp.; R. W. Kempsmith, Bethlehem Steel Co.; C. M. Mason, Jones & Laughlin Steel Corp.; and R. M. Beutel, Patterson-Leich Co., representing the American Steel Warehouse Association.

Public Relations Group To Discuss Their Problems

All sessions of the two-day public relations conference to be sponsored by the National Association of Manufacturers, in the Waldorf-Astoria, New York, Nov. 30-Dec. 1, will be conducted for working public relations executives of industrial firms.

Some problems will be analyzed in forums, others in panel discussion or by case histories, and still others will be presented in dramatic skits. Scheduled participants include: Lewis Brown, president, Johns-Manville Corp., New York; James F. Lincoln, president, Lincoln Electric Co., Cleveland; and E. C. Wampler, executive vice president, Carrier Corp., Syracuse, N. Y.



Obsolete coastal defense railway mortars arrive at a Bethlehem Steel Co. plant to be scrapped. Each contains enough steel to produce more than 3000 of the little trench mortars that helped take Algiers, or 170 three-inch antiaircraft guns

Navy To Use More Commercial Bronze Castings To Save Copper

BUREAU of Ships of the Navy Department will use more commercial bronze castings (Spec. 46-B-11-c) for ship work to conserve copper and at the same time make use of surplus plumbing and hardware scrap which now is a drug on the market.

Yellow brass scrap is reported lately to be literally flooding the market and also is selling well under ceiling prices due to lack of outlets for civilian goods items like plumbing brass. Refineries have not been able to absorb the available supply which has grown not only due to effects of limitation orders but also to the almost complete absence of exports.

In view of the large quantities of this scrap, the Navy has decided to use commercial brass castings wherever practicable, taking into consideration corrosion resistance, machineability and strength requirements.

The move is expected to result in a firmer market for scrap.

As a further conservation measure, the Navy has requested the use of 85-5-5-5 ingot (Spec. 46-B-23-c) in place of Navy "M" metal (Spec. 46-B-8-g) as well as in place of Navy "G" metal (Spec. 46-M-6-g) as a general purpose bronze where temperatures are not excessive and lower tensile strengths are permissible.

For structural purposes, the Navy will consider the use of Navy No. 1 manganese bronze (Spec. 49-B-3-c). It also is emphasized that either 85-5-5-5 ingot or manganese bronze should be used in place of copper-silicon alloy (Spec. 46-B-28) wherever possible.

The changes in specifications will require some changes in procedures on the part of foundries handling Navy work. Both No. 1 manganese bronze and silicon-bronze are free-flowing, pouring temperature being around 1800-1900 degrees Fahr. Navy "M", "G" and 85-5-5-5 generally are poured at around 2100-2200 degrees Fahr.

National Founders Nominate; D. C. Bakewell New President

D. C. BAKEWELL, Blaw-Knox Co., Pittsburgh, has been nominated for president of the National Founders Association, to succeed William D. Hamerstadt, Lockwood Mfg. Co., Indianapolis, Ind. Fred H. Clausen, Van Brunt Mfg. Co., Horicon, Wis., has been nominated for vice president, to succeed Mr. Bakewell, and J. M. Taylor, 120 South LaSalle street, Chicago, has been named to continue as secretary and treasurer.

Report of the nominating committee was presented at the annual meeting of the administrative councils of the organization in New York last week. The report received its unanimous approval and will be submitted to the members for letter-ballot. This method of election has been made necessary because of decision of the members not to hold their regular annual meeting this year, due to pressure of war work. It would have been the forty-sixth annual meeting. Nominations have also been made of members to the seven district committees.

With Mr. Hamerstadt presiding, an alumni dinner was held, 30 or more being present. James A. Emery, Washington, senior counsel, National Association of Manufacturers and an honorary member of the alumni group, predicted a resurgence of independence in Congress as a result of the recent elections, in discussing various aspects of the Washington scene.

Despite difficulty of various iron foundries engaged in light bench work in obtaining sufficient war work for profitable operations, the association showed an actual gain in membership over the past year.

A. E. McClintock, Chicago, long commissioner of the association, was re-appointed for the ensuing year.

D. C. BAKEWELL
Nominated for president, National Founders Association

Mining, Metallurgical Engineers Elect Officers

C. W. Mathewson, professor of metallurgy and chairman, department of metallurgy, Yale University, has been elected president, American Institute of Mining and Metallurgical Engineers. He will be the institute's sixtieth president in 72 years and will take office at the annual meeting in February, succeeding Eugene E. McAuliffe. Erle V. Daveler, vice president, Utah Copper Co., New York, and Harvey S. Mudd, consulting engineer, Los Angeles, have been elected vice presidents.

New directors include H. J. Brown, consulting engineer, West Newton, Mass.; Charles H. Herty Jr., assistant to vice president, Bethlehem Steel Co.; O. H. Johnson, vice president, Mines & Smelters Supply Co., Denver; Russell B. Paul, mining engineer, New Jersey Zinc Co., New York; F. A. Wardlaw Jr., assistant manager, International Smelting & Refining Co., Salt Lake City; and Felix Edgar Wormser, secretary and treasurer, Lead Industries Association, New York.

Election was by letter ballot of 12,000 members.

Officers Elected by Acetylene Association

Newly elected officers of the International Acetylene Association, New York, chosen at the annual meeting in Cleveland, Oct. 14, are: President, Ellsworth L. Mills, vice president, Bastian-Blessing Co., Chicago; vice president, Glenn O. Carter, consulting engineer, Linde Air Products Co., New York; secretary, Herbert F. Reinhard, Union Carbide & Carbon Corp., New York; treasurer, Philip Kearny, president, K-G Welding & Cutting Co., New York.

Directors include: Henry Booth, vice president, Shawinigan Products Corp., New York; E. L. Mathy, vice president, Victor Equipment Co., San Francisco; and R. B. Swope, president, Southern Oxygen Co. Inc., Arlington, Va.

Members of the executive committee are: H. S. Smith, Union Carbide & Carbon Corp.; C. D'W. Gibson, vice president in charge of sales, Air Reduction Co. Inc., and Mr. Kearny.

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

L ORDERS

L-7-c: Ice Refrigerators, effective Nov. 14. Provides for determination of production quotas for each individual ice refrigerator manufacturer in proportion to his ability to reduce use of critical materials. Lists production quotas for each manufacturer covering final two months of 1942.

L-36: Umbrella Frames, effective Nov. 12. Limits output to 30 per cent 1941 total. Restricts use of steel in women's umbrellas (exclusive of tips and handles) to 4 lb. per dozen frames, if they have non-metallic tips and ferrules; 4.35 lb. if they have steel tips and ferrules; ribs limited to 10 of maximum 20-inch length. Restricts use of steel in men's umbrellas to 5 lb. per dozen frames; ribs to 8 of maximum 25-inch length. Use of iron and steel for repair parts limited to 5 per cent total consumed by any manufacturer for frames under provisions of the order.

L-54-c (Amendment): Office Machinery, effective Nov. 11. Prepares new production quotas for office machinery through 1943. Stops or limits fabrication of parts. Use of motors in adding machines is barred, except to complete machines in process as of Sept. 8. Any person, other than Army, Navy, or Maritime Commission) desiring to buy or rent new and restricted office machines should apply on form PD-688.

L-59-b: Metal Plastering Bases, issued Nov. 13. Prohibits production of metal plastering bases and accessories on and after Nov. 16 for any purpose except war procurement.

L-211 (Amendment): NE Steel Products, effective Nov. 12. Prohibits manufacture of non-essential types and styles of barbed wire, wire fencing, and poultry netting. Orders for Army, Navy, Maritime and Lend-Lease shipment are exempted.

M ORDERS

M-38-c (Amendment): Lead, effective Nov. 11. Eases restrictions on use of lead to permit a number of essential uses previously restricted, including certain building supplies, foil for industrial babbitt, certain food packaging, lead-sheathed cable, caskets, and name plates for industrial machinery.

M-99 (Amendment): Printing Plates, Nov. 13. Raises amount of zinc which may be used for plates from 50 per cent of the amount used in corresponding months in 1941 to 75 per cent for the three-month period beginning Nov. 13. After Feb. 13 permitted usage again will be reduced to the 50 per cent rate.

M-109 (Amendment): Rough Diamonds, effective Nov. 11. Prohibits sale or delivery of rough diamonds not incorporated in tools and other devices unless they fill an order rated A-1-j or higher, or the aggregate weight is 50 carats or less of crushing bortz or 5 carats or less of rough diamonds to one consumer in one month, or WPB has specifically authorized the transfer. Permission to make and accept delivery must be applied for by both the seller and the buyer on form PD-377, filed with the WPB New York Regional office. Quarterly reports on stocks of other diamonds on hand must be filed with WPB on form PD-376.

P ORDERS

P-56 (Directive): Mines, issued Nov. 16. In cases of extreme urgency rating of AA-1 will be assigned for purchase of mine maintenance and repair materials in fourth quarter of 1942. New machinery may be assigned rating of AA-2X to secure delivery of essential equipment. Both can be applied only under specific direction of WPB.

P-118 (Amendment): Dairy, Egg Processing Plants, effective Nov. 12. Assigns to deliveries of supplies to processors of dairy products, and eggs or egg products following ratings; AA-2X for emergency maintenance or repair; AA-5 for normal repair, maintenance or operation; AA-3 for replacement on specific WPB authorization, applied for on PD-414.

P-136: Metal Scrap Processors, effective Nov. 6. Assigns following preference ratings: AA-2X for emergency maintenance or repair; AA-3 for repair materials and parts to avert breakdown; A-1-a for repair materials, spare parts and operating supplies to a total value not in excess of $500 for a calendar quarter year.

PRIORITIES REGULATIONS

No. 11 (Amendment): Effective Nov. 16, PRP units must make necessary reratings or adjustments in size of outstanding orders within seven days after receipt of their certificate. No person is required to cancel any part of orders calling for delivery by Nov. 21, or during the first 21 days of the first month of any subsequent quarter, provided the producer certifies (1) that substitution of other orders is impossible and (2) that production of the material in question is complete or that cancellation would disrupt production schedules.

PRICE REGULATIONS

Supplementary Order No. 9 (Amendment). Effective Nov. 14. Excludes 15 specific price schedules and regulations on scrap materials from price adjustment procedure provided by Supplementary Order No. 9 and Procedural Regulation No. 6.

No. 2 (Amendment): Aluminum Scrap and Secondary Aluminum Ingot, effective Nov. 16. Extends premium of ½-cent for scrap which is baled or packaged, suitable for briquetting, and of 1-cent for scrap which is briquetted, or in large pieces too heavy to briquette, to the sale of any of the wrought aluminum alloys, except 2S and 3S.

No. 12 (Amendment): Brass Mill Scrap, effective Nov. 19. Provides that OPA may establish prices for specially prepared scrap by a letter written to the buyer, rather than by previous cumbersome procedure of issuing a formal order. The new procedure may be used by buyers of specially prepared scrap other than brass mills, ingot makers and copper refineries.

No. 138 (Amendment): Ferromanganese, effective Nov. 13. Provides that sellers of standard ferromanganese, made from dutiable ore, to a governmental agency for shipment outside the U. S. may charge the full $135 per ton maximum price, only if they assign the duty "drawback" privilege to the agency; if such assignment is not made, the $135 price must be reduced by $10. The same reduction must be made under certain conditions if the ferromanganese is shipped in bond without payment of duty on the ore.

No. 126 (Amendment): Fluorspar, effective Nov. 23. Raises maximum prices for metallurgical fluorspar to a range of $25 to $28 per short ton, according to the calcium fluoride and silica content.

No. 202 (Amendment): Brass and Bronze Alloy Ingot, retroactively effective to Aug. 19. Sets maximum prices for special "trade name" ingots at their maximum offerings prices in carload lots in effect March 31, 1942.

Prompted by the serious shortage of gages, measuring and dimensional control devices vital to mass production of many ordnance parts and other items, the New York-Northern New Jersey office of the War Production Board has issued a chart showing machine shop owners whether their present equipment is adaptable to this work. District headquarters are at 122 East Forty-second street, New York.

WPB Stockpiling Division Gathers 1943 Imports Data

War Production Board last week announced that basic data on 1943 imports to maintain the nation's wartime economy are being gathered by the Stockpiling and Transportation Division and the various industry divisions.

The Emergency Shipping Priorities List, established in February, 1941, as a basic outline of the country's raw-materials needs, now contains over 200 separate products. Each has a quota and a designation ranging downward from A-1 to indicate its relative importance. Shipping lines and their agents are guided by this list in booking cargoes for various ports.

The Board of Economic Warfare purchases materials abroad for public account; War Shipping Administration assigns the vessel, and WPB determines the need. Where imports are for private purchase, the War Production Board must approve importation. All purchase programs, public or private, are handled in accordance with priority schedules furnished by WPB.

General Imports Order M-63 divides imported commodities into three lists as to their value to the war effort, and this order gives the government more capacity for stressing the first two essential lists at the expense of the third list covering less-essential goods.

Sellers of Idle Stocks of Copper, Steel Must Report

Owners of idle stocks of copper and steel, and their alloys, who sell directly to authorized war producers, as permitted by Priorities Regulation No. 13, now are required to report such sales by an amendment to that regulation.

When a sale of copper is made from inventories previously reported to the WPB, care Copper Recovery Corp., 200 Madison avenue, New York, the seller now must send a copy of the invoice to that address.

Sellers of steel from reported inventories should address their invoice copies to WPB, care Steel Recovery Corp., 5835 Baum boulevard, Pittsburgh.

New WPB Division Established To Direct Materials Control Plan

ESTABLISHMENT of a new Controlled Materials Plan Division and top appointments to its staff were announced last week by J. A. Krug, deputy director general for distribution.

Director of the CMP division and chairman of the Controlled Materials Board is Harold Boeschenstein, president and general manager, Owens-Corning Fiberglass Corp., Toledo, O.

Assistant director is W. C. Skuce, supervisor of materials procurement, priorities and inventory control for the General Electric Co., Schenectady.

In distributing materials under the CMP, Mr. Boeschenstein and Mr. Skuce will work in co-operation with Hiland G. Batcheller, Arthur H. Bunker and Harry O. King, directors, respectively, of the three controlled materials divisions—steel, aluminum and copper—and with the control officers of the claimant agencies.

The CMP Division, which will operate under Mr. Krug's general direction, includes the offices of the director and assistant director, a Controlled Materials Board and an Engineering Board of Review. The Controlled Materials Board will be composed of representatives of the Army, Navy, Maritime Commission, Lend-Lease Administration, Board of Economic Warfare, Office of Civilian Supply, the chiefs of the Aluminum, Copper, Steel, Program and Facilities Divisions, a labor representative and a representative of the Resources Division.

Also established within the new division are a Scheduling Methods Branch, an Instruction, Inquiry and Service Branch and an Operations Branch.

The CMP Division will be the agency charged with development and administration of the operating policies to govern CMP.

An extensive campaign of public education in the operating details of the CMP is being worked out jointly by the CMP Division and the Division of Information of WPB. The plan itself will not become operative until the second quarter of 1943.

CMP To Be Explained by WPB Field Office Specialists

An intensive program is now in effect to equip War Production Board field offices for handling questions on the Controlled Materials Plan. Seventy priorities specialists and other selected men have spent a number of days in Washington in a training school on CMP conducted by the Inquiries, Instruction, and Service Branch of the Controlled Materials Division.

The majority of these men already have left Washington for various regional and branch offices, taking with them comprehensive material on CMP. In each such office, one of these men will explain CMP to the personnel concerned.

In addition, mass meetings will be conducted in 24 key cities where the Washington specialists will further explain CMP.

Metalworking Industry Committees Appointed

WPB Division of Industry Advisory Committees late last week announced formation of several new committees in the metalworking field. They are:

Steel products, H. G. Batcheller, chief, Iron and Steel Branch, government presiding officer. Committee members:

Avery C. Adams, United States Steel Corp., Pittsburgh; Russell M. Allen, Allegheny Ludlum Steel Corp., Pittsburgh; N. J. Clarke, Republic Steel Corp., Cleveland; Isaac Harter, Babcock & Wilcox Tube Co., Pittsburgh; J. A. Henry, Weirton Steel Co., Pittsburgh; Paul Mackall, Bethlehem Steel Co., Bethlehem, Pa.; J. L. Neudoerfer, Wheeling Steel Corp., Wheeling, W. Va.; J. H. Parker, Carpenter Steel Co., Reading, Pa.; L. M. Parsons, Jones & Laughlin Steel Corp., Pittsburgh; A. C. Roeth, Inland Steel Co., Chicago; W. W. Sebald, American Rolling Mill Co., Middletown, O.; W. E. Watson, Youngstown Sheet & Tube Co., Youngstown, O.

Resistance Welding Electrodes, John D. Tebben, General Industrial Equipment Branch, government presiding officer.

Committee members: Peter Hall, Taylor-Hall Co., Worcester, Mass.; G. N. Sieger, S.M.S. Corp., Detroit; W. Simmons, Welding Sales & Engineering Co., Detroit; R. H. Taylor, Electroloy Co., Bridgeport, Conn.; H. D. Weed, R. R. Mallory Co., Indianapolis.

Ferrosilicon producers, Andrew Leith, deputy chief, Ferroalloys Branch, government presiding officer. Committee members:

Chad F. Calhoun, Permanente Metals Corp., Washington; Paul J. Kreusi, Southern Ferro-Alloys Co., Chattanooga, Tenn.; George W. Starr, Ohio Ferro-Alloys Corp., Canton, O.; J. H. Critchett, Electro Metallurgical Co., New York; Ward A. Miller, Vanadium Corp., New York; and O. L. Weissenburger, Keokuk Electro-Metals Co., Keokuk, Iowa.

Silvery iron producers, Andrew Leith, deputy chief, Ferroalloys Branch, government presiding officer. Committee members:

Charles F. Colbert, Pittsburgh Metallurgical Co., Niagara Falls, N. Y.; Edwin A. Jones, Globe Iron Co., Jackson, O.; G. L. Weissenburger, Keokuk Electro-Metals Co., Keokuk, Iowa; E. Kay Ford, Hanna Furnace Corp., Detroit; J. W. Potter, Jackson Iron & Steel Co., Jackson, O.

Resistance welding machine manufacturers, John D. Tebben, General Industrial Equipment Branch, government presiding officer. Committee members:

John Gordon, Taylor-Winfield Corp., Warren, O.; Peter Hall, Taylor-Hall Co., Worcester, Mass.; W. T. Ober, Thompson-Gibb Co., Lynn, Mass.; Maurice Sciaky, Sciaky Brothers, Chicago; G. N. Sieger, S.M.S. Corp., Detroit; and Ed C. Smith, National Electric Welding Machine Co., Bay City, Mich.

Labor Division Established In Detroit WPB Office

Creation of a labor production division in the War Production Board's Detroit regional office and appointment of Clarence M. Bolds of Detroit as its director has been announced. Mr. Bolds, on leave of absence to the government from the Kelsey-Hayes Wheel Co. since early this year, has been in Washington for ten months as an adviser to the WPB labor division.

New Penton Publication To Cover Latin America

Revista Industrial, a new monthly publication for Latin America to make its appearance early in 1943, will be published by The Equipment Digest Publishing Co., Cleveland, a subsidiary of the Penton Publishing Co.

Basic purpose will be to cover latest industrial developments, equipment, processes, materials, methods and applications as well as the available industrial literature from manufacturers in the United States.

Two editions of *Revista Industrial* will be published, one in Portuguese for Brazil and one in Spanish for the other Latin American countries. It will be addressed to firms engaged in mining, construction, public utilities, transportation, processing and manufacturing. Editorial content and page style will follow that of *New Equipment Digest*, a tabloid size publication.

WINDOWS of WASHINGTON

Steel experts needed to man recovery program. . . Idle stocks to be card indexed. . . Army, Navy require more typewriters. . . Three months' disuse test for scrap status

EXPERTS who know steel products and their uses are needed in substantial numbers, at the earliest possible date, to man Steel Recovery Program, now being organized at Pittsburgh. Their services in this work will be needed for about three or four months, it is estimated.

Sponsors of the Steel Recovery Program say it is to be the biggest steel redistribution project ever conceived. It is planned eventually to send out blanks to be filled in by some 400,000 companies who are likely to have steel in any form in idle or frozen inventories. Arrangements are being completed to send blanks immediately to some 10,000 companies which are considered to be the largest tonnage holders. Blanks will be sent to others as rapidly as possible.

The new Pittsburgh quarters are completely equipped with modern office machinery. Cards will be punched for each item in inventories and it will be possible within one or two minutes to locate any desired item. Say the Navy inquires for a tonnage of 2 x 2 angles; the cards with data on angles are run off and reveal that they can be had at Keokuk, Ia., and a number of other places in various sections of the country. The system which has been set up is to function so quickly that the locations of needed steel may be learned during a short telephone conversation.

Salesmen and others who know about steel and its distribution, and who are in a position to devote a period of a few months to this work, are urged to communicate with the Steel Recovery Program, 5835 Baum boulevard, Pittsburgh.

"Dormant Industrial Scrap" Defined; Plan for Collection

Manufacturers are urged to place even more emphasis than in the past on locating and getting out "dormant industrial scrap." For those in doubt as to what constitutes dormant industrial scrap, the official definition is:

"Dormant scrap is defined as obsolete machinery, tools, equipment, dies, jigs, fixtures etc., which are incapable of current or immediate future use in the war production effort because they are broken, worn out, irreparable, dismantled or in need of unavailable parts necessary to practical re-employment."

The Industrial Salvage Section of the War Production Board urges industry to follow this rule in its salvage operations:

"If it hasn't been used for three months, and if someone can't prove that it's going to be used in the next three—find a use for it—or scrap it!"

Each manufacturer is urged to organize the dormant scrap job as follows:

"1—Appoint a top executive with authority to make decisions;

"2—Organize a Salvage Committee to include a member from every department;

"3—Survey and re-survey your plant for untapped sources of dormant scrap;

"4—Prepare a complete inventory of idle material and equipment; tag everything not in use;

"5—Sell your entire organization on the need to scrap unusable material and equipment;

"6—Follow through; keep at it—every day from now on."

The field organization of the Industrial Salvage Section now is collecting the basic data for a continuing inventory of dormant scrap. This is to be revised each month so as to include scrap as it becomes dormant under the above definition.

Undoubtedly there will be some exceptions to the dormant scrap rule. Anyone having any questions can get them answered quickly by writing to Edward F. Mulligan, Industrial Salvage Section, War Production Board, Washington Gas Light building, Washington. Mr. Mulligan also will be glad to send to anyone desiring it a booklet discussing the dormant program in detail.

Industries Asked To Sell 200,000 Typewriters to Armed Forces

All manufacturers and business houses are requested to find ways and means of getting along with fewer typewriters in order that they may be able to turn over 200,000 machines that are badly needed by the government—principally for the armed services. It is pointed out that these needs cannot be met with new typewriters since none now are being produced.

The typewriters wanted are standard—not portable—machines, made after January 1, 1935. They will be bought by the Treasury Department, Procurement Division, through authorized buying agents. These include all typewriter manufacturers and their branches and distributors, also a large number of independent organizations all over the country. In other words, the typewriters will be collected for the Treasury Department by the organizations which in normal times sell and service them. Prices offered are attractive as, for example, $30 for a machine four years old, and $40 for one two years old.

The Office Machinery and Equipment Procurement Committee of the War Production Board which is in charge of the typewriter procurement drive has prepared a booklet entitled "Send Your Typewriters to War". Copies may be had from William N. Harris, Chairman of the committee, 3217 Railroad Retirement building, Washington. This booklet describes and illustrates the many uses of typewriters in the battle zones where they are needed for accurate and rapid transmission and reception of orders by radio and telephone. The Army Signal Corps needs them in large numbers. Even the speedy Navy "mosquito boats" are equipped with typewriters—bolted down securely so that they can be operated no matter how rough the going is.

Present holders of typewriters, experience has proven, in nearly all cases can get along with fewer typewriters. In many instances reliance upon fewer typewriters leads to increased efficiency. As one of many examples, Swift & Co. found a way of improving their communications with their many branch offices all over the country. In the past letters and instructions from the home office required typewritten acknowledgements. Now the letters and orders are sent in duplicate; instead of dictating a reply to be typewritten, the branch office man merely detaches the carbon, writes his acknowledgement or reply by hand on the back and returns it to the home office.

By means of these and other short-cuts, Swift & Co. were able to turn over 38 per cent of all their typewriters for the use of the Army and Navy.

Schools, state and municipal government departments, hospitals and various other public institutions, as well as individuals, also are being solicited. But business and industry are considered to be the largest potential source, and business men are asked to take the initiative and turn in typewriters quickly rather than wait for overtures from outside.

Manning Tables More Important As Deferments Become Restricted

The War Manpower Commission and the Army Selective Service System asks all employers to prepare "manning tables" (see STEEL of Nov. 16, p. 67.) These tables should list each job and state how long it takes to train a candidate for the job. The tables are to be

submitted to local draft boards to support requests for deferment of essential workers. Without such tables employers will have an increasingly tough time in trying to convince the draft boards that deferments are necessary.

That employers may fully understand the urgency of preparing such tables some discussion of the thinking and the future activities relating to the manpower problem is warranted.

As one high official puts it: "Every able-bodied man of draft age is going to be called into the armed forces. There will be no blanket deferments. Deferments will be good only for limited periods, allowing time to train replacement workers for essential jobs. There will be no exceptions whatever, even with respect to miners and farmers and dairy workers. We expect the farmer as well as everybody else to pull in his belt and seek out whatever help he can get—and use it.

"But in drafting men we will have to proceed in a careful, orderly manner so as not to interrupt production. That is the idea behind the manning table plan. All employers should set up manning tables. We need this assistance in order that we can raise the required army with as little shock as possible".

Employers also should know that the manpower authorities expect them to organize so as to permit the fullest utilization of labor. Specifically, the War Manpower Commission and the Army Selective Service System like the existing arrangement at Baltimore where employers have signed an agreement not to lure workers away from each other. A labor-management committee settles all questions involving transfer of workers from one plant to another. The worker has the right to appeal. The agreement provides that if a CIO man goes to work in a shop having an AFL agreement he does not have to join the second union.

Employers shortly will become conscious of greater emphasis on full utilization of workers. Many reports have come to Washington about inefficient operations caused, for example, by bottlenecks in production lines which hold up men in other parts of the line. The War Manpower Commission shortly will begin sending inspectors to manufacturing plants to find out at first hand just how labor is being utilized in them. In this study emphasis will be placed on labor-management co-operation, and management will be appraised on the basis of its efficiency.

The commission is determined to eliminate pirating. Recently shipments of military aircraft to a foreign destination were held up by lack of radio equipment. It was found this was due to pirating of labor in a New England town with a resulting falling off in the supply of condensers. This is only one of many examples to demonstrate why the War Manpower Commission is preparing to spank employers guilty of piracy. Incidentally, the War Labor Board, with its control over wages, already has proved to be an effective brake on pirating. Community labor-management committees, as in Baltimore, are expected to be in the nature of a double check against pirating.

Building of Transportation Equipment "Essential to War"

War Manpower Commission has certified that the production of transportation equipment is an activity essential to support of the war effort.

Production of transportation equipment is defined to include motor vehicles such as trucks, ambulances, fire engines, buses and military motorized units; essential parts and accessories of such motor vehicles; motorcycles, bicycles, and parts; locomotives and parts; railroad and street cars and equipment.

The commission has released a list of occupations in the production of transportation equipment which require a reasonable degree of training, qualification, or skill to perform duties involved, in order that the activity may maintain efficient production. The list is restricted to those occupations which require six months or more of training and preparation.

General Statistical Staff To Service WPB Industry Divisions

Completion of the organization of War Production Board's General Statistical Staff was announced by Ernest Kanzler, Director General for Operations.

While the WPB Division of Statistics under direction of Dr. Stacy May will continue to function as the over-all statistical organization, compiling data for the total war production effort and addressing itself to general research and statistical problems, the General Statistical Staff will service the WPB industry divisions directly.

The order creating the staff declares that it shall "standardize and simplify statistical procedures for the purpose of accelerating the work, reducing duplication of effort, and assuring one recognized source of official statistics."

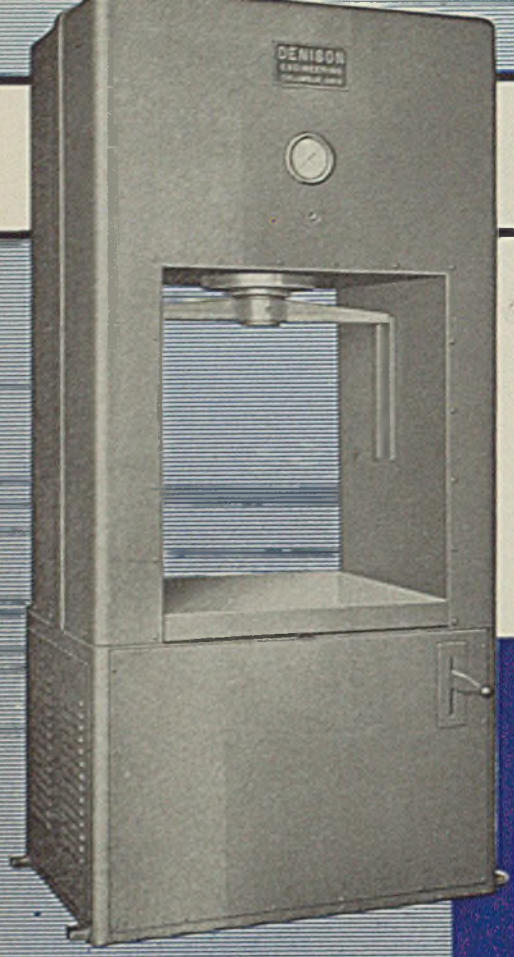
Chief of the staff is Dr. Vergil D. Reed, who also continues to serve as chief of the Industry Facilities Branch of the Division of Statistics. He was assistant director of the census from June, 1936, until he became associated with the War Production Board in March, 1942.

DIRECTS ALLOCATION, DISTRIBUTION OF MATERIALS

TO Ferdinand Eberstadt, program vice chairman of the War Production Board, falls the responsibility for the allocation and distribution of the raw materials vital to the war effort. A former New York investment banker, Mr. Eberstadt is consolidating the operations and program determination offices of the agency (STEEL, Nov. 16, p. 47)

VERSATILE 50-TON

Equally Efficient On Small-lot and Production-line Assembling, Bending and Straightening



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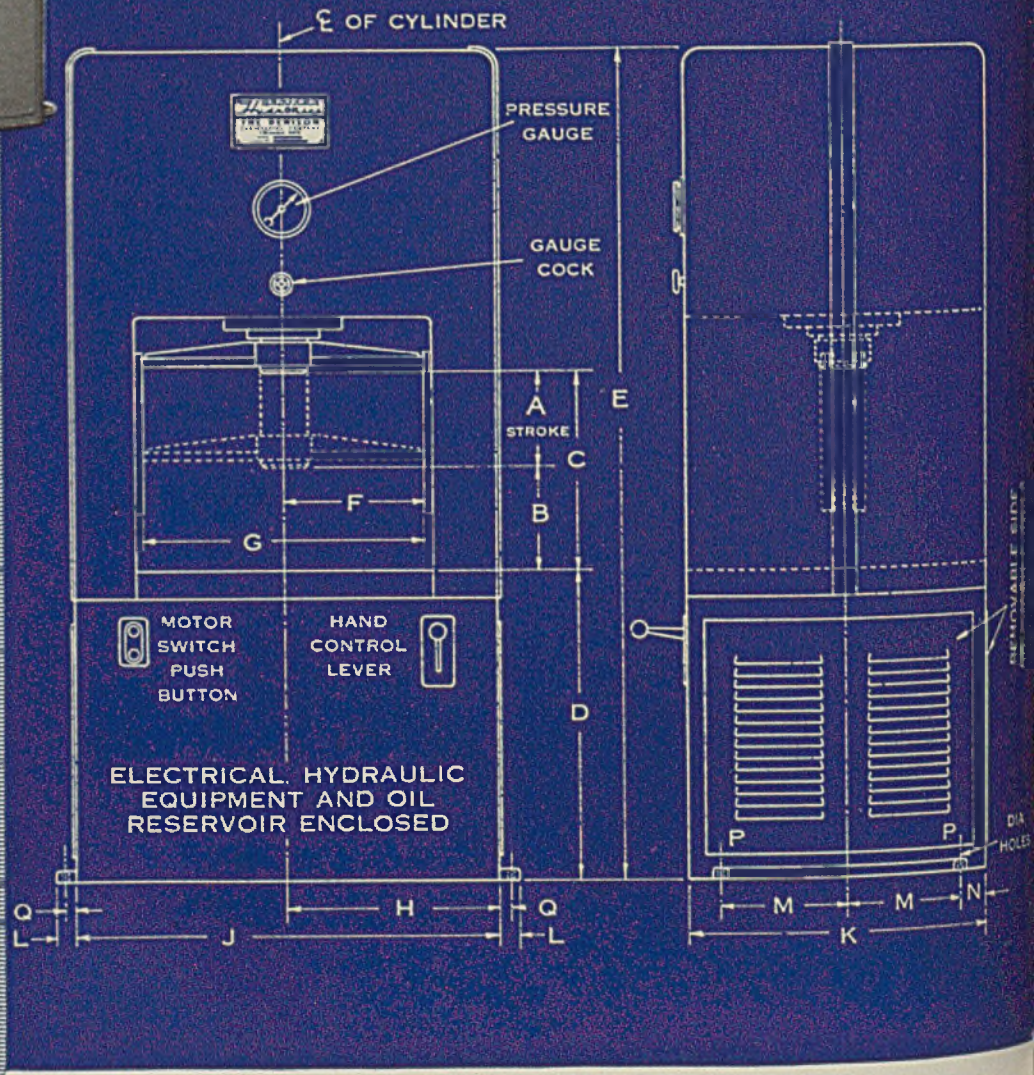

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DENISON EQUIPMENT *in* APPLIED

Hydrolics

TRADE-MARK

OPEN-SIDE HydrOILic PRESS

The versatility of this Denison HydrOILic Press makes it quickly adaptable for an extremely wide range of operations — with equal efficiency on either small-lot or production-line work. The flexibility of its smooth, oil hydraulic operation gives you variable tonnage control in a stepless range of from approximately 5 tons up to the full 50-ton capacity. All operating mechanism is completely enclosed in the streamlined, safety-cornered frame—a feature that promotes safety for the operator. Like other Denison HydrOILic presses, the DLOS2-50 stands up under long, hard use with minimum maintenance. All principal moving parts operate in a bath of oil. You'll find you can get more effective POWER, SPEED and CONTROL for many pressing jobs in your plant with this modern press. Available with either manual or electric controls, or both. Write for further information today, or call your Denison representative.

DLOS2-50

		K	40
A	18	L	2 ½
B	18	M	16
C	36	N	4
D	39	P	1 1/16
E	116	Q	1 ½
F	18	W	10000
G	36	X	10100
H	27	Y	10250
J	54	Z	330

SPECIFICATIONS

	DLOS2
MAXIMUM WORKING CAPACITY, TONS	50
CYLINDER BORE, INCHES	8
RAM SPEED, DOWN (RAPID TRAVERSE) F.P.M	12
RAM SPEED, DOWN (HIGH PRESSURE) F.P.M.	1.2
RAM SPEED, UP F.P.M.	27
PUMP VOLUME, GALLONS PER MIN.	23/2.5
MAXIMUM WORKING PRESSURE, P.S.I.	2000
MOTOR H.P. 1200 R.P.M.	7.5
RAM DIAMETER, INCHES	6
RAM THREAD, FEMALE, SIZE, PITCH	2"8P
OIL RESERVOIR CAPACITY, GALS.	60

OPERATION

When the ram is at the limit of the upstroke the directional control valve is automatically and positively held in neutral position, preventing movement of the ram, while the pump and its motor idle. With pump and motor idling, minimum power is consumed. Downward movement of the control lever causes the ram to move downward at rapid traverse speed, exerting minimum tonnage until it contacts the work. Further downward movement of the control lever increases tonnage applied to the work. If the control lever is released, the ram moves upward until the upper stroke "stop" is reached, and the control valve automatically brought to neutral.

Priorities still have first call on HydrOILic Press output. But since conditions may change rapidly, we suggest you submit your requirements to us without delay. We'll tell you promptly the delivery we can make in your particular case.

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Gives latest specifications on Denison's line of HydrOILic Presses, known for high accuracy of POWER, SPEED AND CONTROL for a wide range of operations—assembling, straightening, bending and others! Also contains valuable engineering data. Write at once for your free copy of Bulletin 109.

DLOS2-50 OPEN-SIDE PRESS

CAPACITY: 50-TONS

MANUAL OR ELECTRIC CONTROLS

MAX. WORKIN PRESSURE: 2,000 p.s.i.

MAXIMUM STROKE: 18"

MAX. THROA OPENING: 16'

MAX. VERTICA OPENING: 36'

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Hauck Appointed in Steel Control Section

W. A. Hauck, formerly with the WPB Steel Expansion Unit, has been appointed assistant chief of the Steel Control Section of the Controlled Materials Plan by H. G. Batcheller, director of the Steel Division, WPB. E. L. Resler is chief of the Control Section.

Mr. Hauck came to Washington in June, 1940 as assistant group executive of the Steel Branch of the Advisory Commission to the Council of National Defense. At that time, Walter S. Tower was the only steel man in Washington and W. L. Batt, now assistant to Donald Nelson, was another executive with Tower and Hauck.

Mr. Hauck was subsequently steel consultant for the Office of Production Management and handled steel expansion. Under the War Production Board he was chief of the Planning Unit and chairman of the Plant Facilities Committee of the Iron and Steel Branch. He formerly was associated with Bethlehem Steel Co. and Lukens Steel Co.

Additional Industry Committees Appointed

Formation of three new industry advisory committees has been announced by WPB. They are for the construction machinery industry, for the fractional horsepower motor industry, and for the commercial dish washing machines industry.

Government presiding officer for the construction machinery committee is William M. Parrish, assistant chief, Construction Machinery Branch. Members are: W. H. Armel, International Harvester Co., Chicago; G. A. Bahler, Caterpillar Tractor Co., Peoria, Ill.; S. L. Myers, La Plant-Cheate Co., Cedar Rapids, Iowa; Frank Ross, Willamette Hyster Co., Peoria, Ill.; Frank Creune, Gar Wood Industries, Detroit; H. L. Fox, Bucyrus-Erie Co., Milwaukee; Paul T. Newton, New Holland Machine Co., New Holland, Pa.; and P. R. Van Trease, J. D. Adams Mfg. Co., Indianapolis.

John Gammell, General Industrial Equipment Branch, is government presiding officer for the fractional horsepower motor committee. Members are: W. H. Eldridge, Holzer Cabot Company, Boston; W. R. Frazer, Emerson Electric Mfg. Co., St. Louis; W. H. Henry, General Electric Co., Ft. Wayne; W. Lisman, Leland Electric Co., Dayton, O.; H. S. Weiner, Electrolux Corp., Old Greenwich, Conn.; J. Nader, Ricor Inc., Chicago; Neil C. Reed, Westinghouse Electric & Mfg. Co., Lima, O.; J. H. Tilbrook, Delco Products Division, General Motors Corp., Toledo, O.; and C. C. Shengraw, Eclipse Aviation Division, Bendix Aviation Corp., Bendix, N. J.

W. A. HAUCK

Government presiding officer for the commercial dish washing machines committee is Harry J. Holbrook, Plumbing and Heating Branch. Committee members are: Gale Blakeslee, G. S. Blakeslee & Co., Chicago; H. L. Oce, Surgex Mfg. Co., Oakland, Calif.; P. H. Davis, Jr., Champion Dish Washing Machine Co., Erie, Pa.; Floyd H. Emery, Josiah Anstice & Company, Rochester, N. J.; C. L. M. Insinger, The Insinger Machine Co., Philadelphia; O. V. Jackson, Jackson Dishwasher Co., Cleveland; Homer F. Lyman, Universal Washing Machinery Co., Nutley; H. A. Nordquist, Hobart Mfg. Co., Troy, O.; E. C. Peters, Lansing Mfg. Co., Cleveland; George R. Porter, Colts Patent Fire Arms Mfg. Co., Rochester, N. Y.; and John F. Wholey, Faspray Corp., Red Bank, N. J.; Thomas Sutcliffe, Fealress Dishwasher Co., Rochester, N. Y.

Judson Heads New WPB Unit

W. W. Judson, St. Paul, Minn., general manager of the Northern Pacific railway, has been appointed chief of the new Public Services Branch of the WPB Program Division.

William F. Lahl, research engineer for the Crane Co., Chicago, has been named a consultant in the valve and fitting section of the WPB Shipbuilding Division.

United Nations' Committee Studies Truck Distribution

The Combined Production and Resources Board, comprising Donald M. Nelson, Oliver Lyttelton and C. B. Howe, has announced appointment of an American-British-Canadian joint committee on distribution of military and civilian truck production for the United Nations, as follows:

For the United States: Arthur S. Newhall, chairman, Dr. Henry S. Rogers and Lieut. Col. K. D. Mann. For the United Kingdom: Col. H. C. Goodfellow, Brig. Gen. K. M. F. Hedges J. Masterton and B. B. J. O'Donnell. For Canada: Henry Borden, J. R. Berry and A. H. Williamson.

The joint committee will consider and make recommendations on standardization of models; requirements; production facilities; type of pack for various areas; allocation of tire rubber. Chairman Newhall states that the committee will report its findings in about three weeks.

Molybdenum, Tungsten Wire, Rod Advisory Groups Formed

Formation of a Molybdenum and Tungsten Wire and Rod Industry Advisory Committee has been announced by WPB Division of Industry Advisory Committees. Government presiding officer is M. T. Metzger, assistant chief, Ferro Alloys Branch.

Committee members are: Frank Bishop, General Electric Co., Cleveland; H. W. Boessenkool, North American Phillips Co., Lewiston, Me.; R. S. Broadbent, Westinghouse Electric & Mfg. Co., Bloomfield, N. J.; A. J. Dowe, Fansteel Metallurgical Corp., Chicago; William N. Mansfield, Cleveland Tungsten Corp., Cleveland; D. Ructolo, Sirian Wire & Contact Co., Newark, N. J.; and G. C. Wheeler, Gallite Corp., Union City, N. J.

Restrictions On Deliveries Of Tungsten Ores Liberalized

Tungsten ores or concentrates may be delivered by any producer, dealer, or processor to dealers or processors for the purpose of being concentrated or beneficiated, without specific authorization by WPB, that agency announced recently with the issuance of Amendment No. 1 to General Preference Order M-29, as amended June 30, 1942.

Delivery without specific authorization by WPB was restricted by M-29 to ores and concentrates containing 20 per cent or less of tungsten trioxide. Because the 20 per cent distinction hampered the free flow of ore from producers, the amendment permits movement without specific authorization from producers, dealers, or processors to concentrators. Control over tungsten is exercised by WPB when delivery is made to consumers.

Army, Navy To Retain Control of Prices for Military Materials

AN arrangement regarding control over prices of war goods along lines already in effect has been announced by the War and Navy Departments and the Office of Price Administration.

In general, OPA will refrain at this time from further extension of its controls over military materials and services. Accordingly, military items, their subassemblies and parts, which now are exempt from OPA regulations, will in general be left to control by the War and Navy departments. Materials, subassemblies and parts of these items, and finished goods that have close civilian counterparts, which now are under OPA regulations, will in general remain there with special provisions for price adjustments under Procedural Regulation No. 6.

The War Department and the Navy Department will use all their powers to control profits and prices on the items exempt from OPA control and left to their jurisdiction.

Firms selling military items should take care to determine whether their sales are subject to OPA regulations or are under price control of the War and Navy Departments. It is emphasized that no sales heretofore subject to OPA control have been exempted as a result of the new arrangement.

Higher Ceilings Permitted for "Trade Name" Brass Ingots

Maximum prices for special "trade name" brass and bronze alloy ingots which are produced by persons other than those considered in the trade as ingot makers and which customarily sell at higher prices than regular ingots have been set by OPA.

For such ingots, sellers may use as ceilings their maximum offering prices in carload lots in effect March 31, 1942, less 10 per cent.

Special "trade name" ingots are made by foundries, rather than the regular ingot manufacturers. The selling foundries claim their special ingot has superior properties, and over the years they have commanded prices of 6 cents a pound or more above the prices established by Maximum Price Regulation No. 202 for comparable grades of ingot purchased from regular ingot makers.

"Trade name" brass and bronze alloy ingots play a vital role in the war effort. They are used in aircraft manufacture, particularly in aircraft engine bearings.

WPB Arranges for Building of More Than 300,000 Ice Boxes

Program for production of more than 300,000 ice boxes next year, using the absolute minimum of iron and steel, has been announced by WPB. It contains no provisions for manufacturers of mechanical refrigerators.

Necessitated by the complete curtailment of production of other types of household refrigerators and by requirements of the armed forces and other essential uses, the program involves a new WPB principle in assigning quotas to producers for manufacture of consumers' goods.

This principle provides for determination of production quotas for each individual ice refrigerator manufacturer in proportion to his ability to cut down on use of critical materials.

In addition to establishing a program for next year the order, L-7-c, lists production quotas in an appended schedule for each manufacturer covering the two months ending Dec. 31 of this year.

Used Machine Tool Dealers Required To Register with OPA

Two thousand certificates of registration have been mailed by the OPA to persons selling second-hand machine tools or extras, or second-hand machines or parts.

They are first to go out under OPA's requirement that all dealers in this class, automatically licensed under Supplementary Order No. 20, must register on OPA Form No. SO 20:3. The order includes persons selling as principal agents, brokers or auctioneers.

Persons who have not yet registered were warned that they should do so without delay before a penalty for late registrations is imposed. Blank forms on which to register may be obtained from the machinery branch of OPA or any of the agency's state or regional offices.

New Steel Drums Placed Under Allocation Control

New steel drum containers and parts in the hands of manufacturers have been put under complete allocation control.

Purpose of the action is to channel delivery of new steel drums to supply the most essential requirements of the production program.

Sheet steel allotted for the manufacture of steel drums has been found insufficient to satisfy all outstanding orders rated AA-1 or higher, making it necessary to exercise tighter control over sale and delivery of the containers.

Use of Stainless Steel Banned in 75 Products

Use of stainless steel in more than 75 products, ranging from coffee pots and cutlery to farm machinery and hot water heaters will be prohibited under the terms of the revised iron and steel conservation order M-126.

Effective immediately, delivery of stainless steel for products on a new List S is prohibited. For a period of 30 days, manufacturers may use, out of inventories, up to 50 per cent of the average monthly stainless steel consumption for such products in 1941.

Complete stoppage of stainless steel use for the products on List S is effective at the end of the 30-day period, except that assembly is permitted for an additional 15 days.

Mining Industry Assured of Highest Ratings for Maintenance

The United States mining industry last week received assurance of the highest priority assistance with announcement by the Requirements Committee that in cases of extreme urgency a rating of AA-1 will be assigned for purchase of mine maintenance and repair materials.

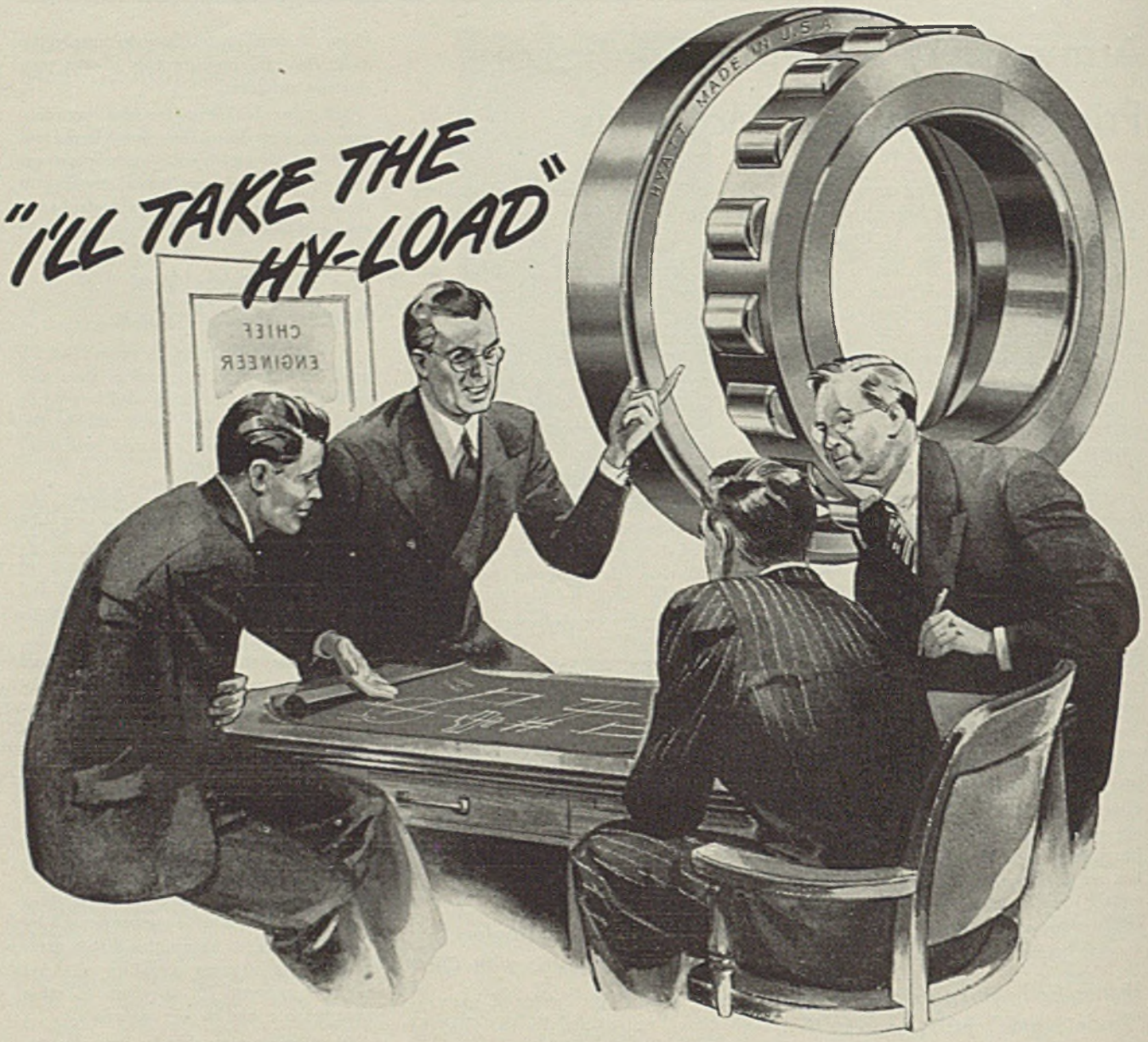
New mining machinery may be assigned a rating of AA-2X, where this high rating is considered necessary by WPB to secure the delivery of essential equipment.

It is pointed out that these ratings are not blanket ratings but may be applied only under specific direction by WPB.

The amount of material to which the high ratings may be applied in no case may exceed the amount which has already been set aside for the mining industry for use in fourth quarter of 1942.

Umbrella Output Limited To 30% of 1941 Volume

Umbrella production next year will be less than one-third of what it was in 1941, and the umbrellas themselves will be generally uniform in size, shape and weight. This will allow production of approximately 4,000,000 men's and women's umbrellas in the next twelve months—compared to 12,787,000 in 1941.



SAYS THE MAN who knows his bearings, "because heavy loads are taken in stride by high-capacity Hyatt Hy-Load Roller Bearings."

That's why, in America's drive for more and more production...with machinery geared up to punishing speeds you'll find Hyatts carrying the load. And in the Tanks...Trucks...Guns...Ships...Planes, which these machines build, Hyatts are also serving.

Yes, the men who know their bearings say, "I'll take the Hyatt Hy-Load Bearing for tough jobs." And to back up their judgment are fifty years of Hyatt application in all types of industrial, automotive, and farm equipment... without ever letting the builders down.

Nor will they let Uncle Sam down for, as they guard the machines that run farms and factories, they also carry the bearing loads of the machines that fight.

Hyatt Bearings Division, General Motors Corporation, Harrison, N. J.

THE 50TH YEAR OF **HYATT** ROLLER BEARINGS

By A. H. ALLEN Detroit Editor, STEEL

MIRRORS of MOTORDOM

Army ordnance observer says U. S. tanks unequaled in firepower, mobility and armor. . . Revised production outlook indicates no manpower shortage in Detroit area. . . Working 60-hour week

DETROIT

"THE COMBAT TEAM" is something you are going to hear a lot more about, now that the U. S. Army has launched a major offensive operation. It is the American version of the "high command" in military operations in that it represents the integration and co-ordination of all branches of offensive warfare —airplanes, tanks, artillery, tank destroyers, armored cars, weapon carriers, personnel carriers, landing barges, troop transports, etc. Equipment supplied to the various elements of the combat team has specified functions and is designed and built with these functions in mind.

Correlation of various offensive arms is nothing new, for Army officers have been concentrating on perfecting the combat team for more than ten years. although it is only in recent years that there has been a sufficient number of men and equipment to put the plan in practical operation. Take the word of Lieut.-Col. J. M. Colby, chief of the development branch of the Tank and Automotive Center, Ordnance Department here, that the "new" U. S. Army packs a terrific wallop once it gets under way, and will out-blitzkrieg anything the Germans have yet put on the record.

Colonel Colby addressed the local chapter of the S. A. E. last week and prior to the occasion spoke to a group of editors here on some phases of equipment, principally tanks, being supplied the armored forces. For ten years, he has centered his attention on ordnance-automotive equipment, after having come up through West Point and all the Army training schools and colleges. In May, 1941, he went to Egypt as military observer and in the ensuing months traveled all through the Middle East and Africa, devoting much of his time to instructing British personnel in maintenance of ordnance equipment supplied under Lend-Lease.

U. S. Tanks Unequalled

With this first-hand knowledge of tank performance, Colonel Colby's statement that American-built tanks have no equal from the standpoint of firepower, mobility and cover (armor) can be taken at face value. He says our medium M-3 and M-4 tanks can outpoint the best the Germans can offer—their Mark 3 tank with 50-millimeter gun and Mark 4 with 75-millimeter howitzer, firing high-explosive but not armor-piercing shell.

Tank battles in North Africa have been curious affairs, according to the Colonel, marked by the use of tanks not as driving, bruising offensive breakthrough weapons but as mobile gun emplacements. Neither side appeared disposed to rush in with tanks and fight at close range. Success which Rommel achieved last November and December in driving the British back into Egypt, as well as the success which Montgomery is now achieving, are ascribed by Colonel Colby as primarily due to the efficient functioning of the "combat team" mentioned earlier. Aerial reconnaissance to establish enemy dispositions, aerial bombardment to soften up objectives, accurate radio-direction of tank maneuvers, and the follow-up by motorized infantry and supplies, must be geared constantly and carefully for success.

Approves Airplane-Type Engine

Despite the opposition which many nonmilitary persons have voiced to the use of radial airplane-type engine in tanks, Colonel Colby points out that these engines have many advantages in the field. In the first place, they fit into a tank better than an in-line engine. Second, they are more adaptable under conditions of temperature extremes, both high and low. Third, they are less vulnerable than a liquid-cooled engine, because they have no radiators, hose lines and related equipment, damage to which might wreck the engine. Fourth, they are lighter in weight, permitting more armor to be placed on the tank and ammunition to be carried.

It might reasonably be argued that in a 32-ton vehicle a few hundred pounds one way or the other makes relatively little difference, but apparently the services think otherwise.

Colonel Colby makes some interesting observations on the wear of tank treads. He observes that operation in sand seems to have relatively little abrasive effect on rubber treads, contrary to beliefs which had been expressed widely around Detroit. The Colonel mentioned one set of treads he had inspected after 2000 miles of operation in sand which looked "nearly as good as new." Tank travel on wind-swept terrain covered with broken rock of assorted sizes is a little different, but here again there appears to be no serious problem on the score of tread wear. Secret of success of American tank tracks lies not in the tread itself but in the method of joining the treads together by means of rubber-covered pins. Steel treads do not

FORD PRODUCES AIRCRAFT ENGINES IN AUTOMOTIVE STYLE

EXPERIENCE gained by Ford engineers in mass production of automobiles has been called into play in the volume manufacture of Pratt & Whitney aircraft engines, shown above on the assembly line where each workman performs a specific task. NEA photo

seem to wear down much faster than rubber, although they do pose some vibration problems in the tank itself, especially on hard-surfaced operational theaters. The Tank Engineering office here is concentrating on the improvement and standardization of tank designs, but not at the expense of supplying field forces with all the tanks they require. Changes are being made continually and new types of tanks, armored cars and weapon carriers pushed through the pilot stages into production. There are literally scores of new types of vehicles in this category about which little or nothing has been heard even here where some of them were "born."

Two important developments in medium tank design are now in the making. One is the adaptation of an infinitely-variable type of transmission, perhaps an "industry" transmission built by several different plants; the other is the gradual standardization on some one or two types of engine. While the Army would like to see the air-cooled radial engine as standard, it is hinted the Ford 8-cylinder 500-horsepower liquid-cooled airplane-type engine may eventually turn out to be the "mass production" tank engine. This 1400-pound power unit already is in production, weekly output running into three figures.

Curious thing about this engine is that it was originally designed for use in airplanes in a 12-cylinder version, with exhaust-driven supercharger. Four cylinders were lopped off—two on a side since it is a V-type engine—and it was then approved for use in tanks. Several hundred pounds of aluminum are used in its construction, a fact which impresses some observers as peculiar; that is, the use of so much aluminum in an engine for a heavy, lumbering vehicle like a tank. The answer probably is that the engine was originally desiged in light-weight form for airplane installation, and the aluminum castings could not be changed to gray iron without throwing design calculations completely out of whack.

No Labor Shortage in View

In the current hysteria over manpower problems which radiates from Washington there has been surprisingly little sober analysis of just how industry stands in the matter. Speaking for the automotive industry and its allied parts suppliers, George Romney, managing director of the Automotic Council for War Production, declares the anticipated labor shortage in this industry has been indefinitely postponed in the Wayne county area, of which Detroit is the hub. Three reasons are advanced for this easier situation in the labor market. First, the shift in production emphasis from certain types of war products to other types; second, shortages of material and complications in distribution of material; and third, exaggerated estimates made by the U. S. Employment Service.

This service tabulates estimates supplied by personnel officials in various plants, which cover present employment and projected employment over the months just ahead. These estimates are uniformly on the strong side and are based on a number of "ifs"—if we get certain new contracts, if we get necessary materials, if we can find some more machinery, etc. The figures take no account of the sharp scaling down of ordnance production which has resulted in recent weeks, ostensibly the result of shifting production emphasis to aircraft.

Figures Are Meaningless

Hence, employment projections to February of next year, which showed an increase of 57,000, and further projections to a 1943 peak requiring 101,000 more workers than at present, must be discarded as meaningless. In war industries (and this does not hold true at all for "civilian" industries the Detroit area has not felt the manpower pinch as yet, and employment of women to date has been comparatively small.

War production of the automotive industry currently is somewhere around $17,000,000 a day, and earlier estimates had indicated it would reach $22,000,000 a day by the first of the year. However, there has been a decided tapering in output of trucks and other mechanized equipment and as a result the projected war production totals in the industry for January are now expected to be "appreciably below" expectations of some months ago.

The average work week in the industry here is pretty close to six 10-hour days, which means, in terms of wages, 40 hours at regular rates, 8 hours at time-and-one-half and 12 hours at double time, or 76 hours at the base hourly rate. Should the standard work week be changed to 48 hours by Washington legislation, it would mean a reduction of 60-hour "overtime equivalent" from 76 hours to 68, or in terms of wages, a cut of about 11 per cent.

This would not set well with union workmen and would require adjustments in most union contracts which now provide for the 40-hour week and overtime pay for time beyond this. Actually, no additional manpower would be provided here in war plants which are now working 60 hours weekly, but there might be release of some personnel from civilian industries and services if they were no longer restricted to 40 hours a week, according to some reasoning.

In connection with expansion of production and fabrication of aluminum alloys for aircraft, the report is heard of plans to set up a new aluminum forging operation in a plant owned by Republic Steel Corp. at Monroe, Mich. This facility would produce aluminum alloy forgings for airplane engine cylinder heads, parts hitherto made by casting. Considerable machine equipment, principally special types of millers, is required to finish the forged type of head, designed by Wright Aeronautical Corp. engineers. It is difficult to appreciate why additional facilities are needed for cylinder heads, when it is considered that one large new foundry is being geared to turn out 8000 cast heads a day, or enough for 400 engines a day, with 50 per cent spares. And there are several other foundries now producing the same items!

Announcement from Washington of a $4,000,000 DPC loan to Chrysler Corp. for expansion of plant facilities in Michigan in connection with a new phase of war production brought speculation in Detroit over what the project involved. Best information is that a "highly secret" job has been started, so secret in fact that all correspondence covering it is delivered personally rather than by mail. Release of news of the loan was considered ill-advised by Chrysler spokesmen, who indicated that nothing at all could be said as to the manufacturing program it covered.

Auto Plants August Output Up 126.1% from February

Shipments of war goods from plants of the automobile industry reached $537,090,000 in August, an increase of 126.1 per cent over last February.

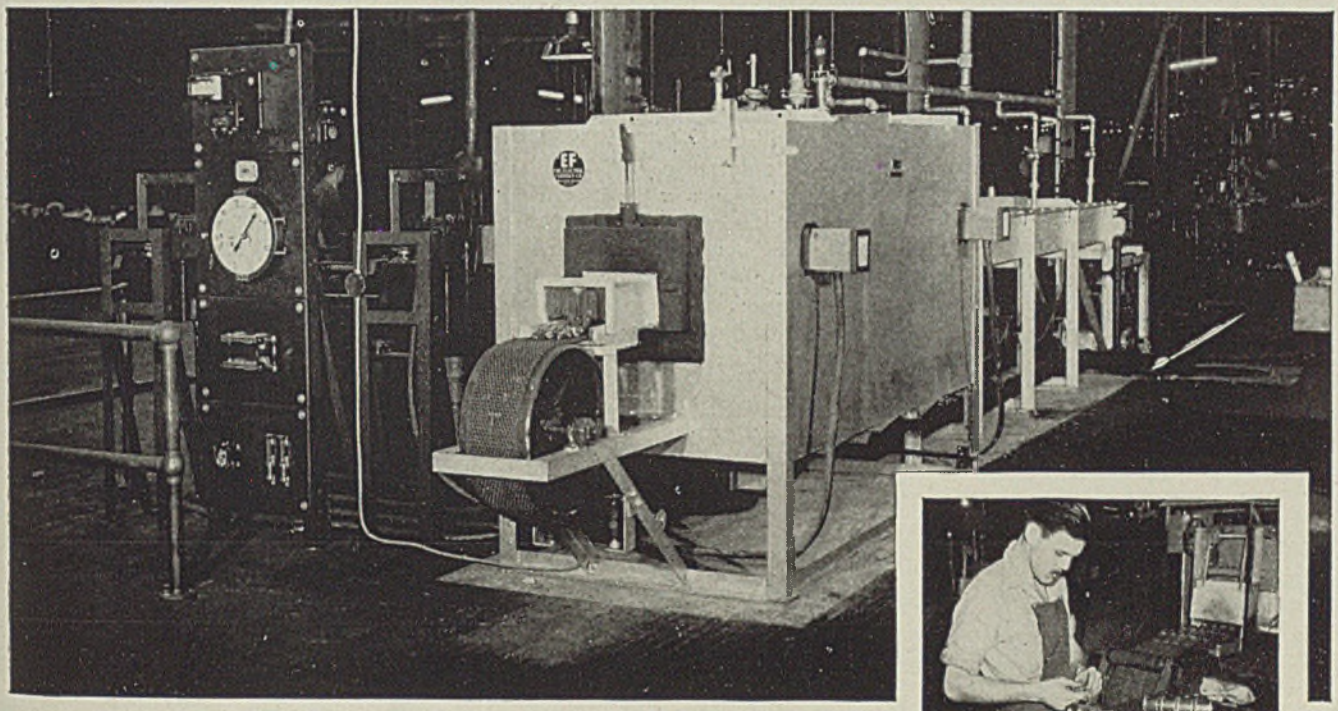
Figures released last week by R. L. Vaniman, chief of the WPB Automotive Branch, are derived from reports on 396 plants owned by 133 companies. This group of companies—seven major automobile manufacturers, 11 truck firms and 115 parts producers—represents approximately 68 per cent of the entire industry.

The number of wage earners in the 396 automobile plants in September was 659,411, an increase of 2.7 per cent over August, and an increase of 30.6 per cent over last February.

Total shipments, including shipment of parts by subcontractors to prime contractors, rose for another consecutive month in August, reaching a total of $566,013,000. This compares with $540,284,000 in July, $494,113,000 in June and $427,598,000 in May.

EF FURNACES

For Every Industrial Heat Treating Process



The operator assembles the parts and places them on the furnace conveyors.

MISCELLANEOUS STEEL ASSEMBLIES ARE JOINED

60 to 75% faster at 1/4 the former labor cost by the Copper Brazing Process

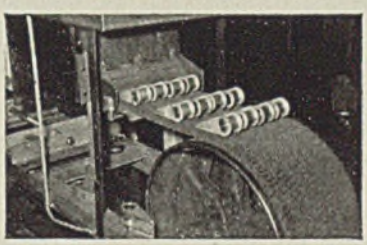
"Greatly improved results—neater, stronger joints—60 to 75% faster, at about one quarter the former labor cost," that briefly is the report received from the manager of a prominent midwestern plant after installing the above EF continuous copper brazing furnace for joining some of their steel assemblies.

Within a month after installing their first brazing furnace, a second similar but larger furnace was ordered for joining other products—the illustration at right below shows both furnaces operating side by side, joining all kinds of assemblies,—large and small—neatly, economically and securely.

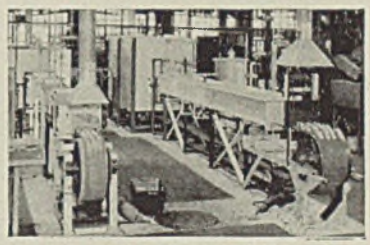
Products difficult or expensive to make in one piece can be made in several pieces and joined—thus not only reducing the cost but actually improving the quality and appearance. Products requiring several stampings joined or requiring screw machine parts, forgings and stampings to complete the unit, can be neatly and economically joined right in the production line in your shop.

Any number of joints in the same product or any number of pieces can be joined at one time. The most intricate parts or assemblies are made to actually "grow together," and joints made which are as strong, or even stronger than the original parts. On some parts it is possible to anneal and braze in one operation.

Investigate the brazing process for your products. With slight changes in design you may be able to join your metal parts, neater, cheaper and stronger by this method.



The assemblies are discharged at the other end... all units securely and neatly joined.



The satisfactory results from the first furnace at left sold the larger furnace at right.

Send for printed matter showing this and other types of EF furnaces.
Investigate the Copper Brazing Process For Joining Your Metal Parts.

The Electric Furnace Co., Salem, Ohio

Gas Fired, Oil Fired and Electric Furnaces---For Any Process, Product or Production

WING TIPS

Test flights show Army's new Sentinel to be rugged "flying jeep". . . Stinson credited with many "firsts" in aviation. . . Exchange of Services promoted by West Coast aircraft council

"EYES of the army upstairs" is what they call the new Stinson "flying jeep," 2100-pound two-place observation plane recently christened in Wayne, Mich., by Mrs. Eddie Stinson, wife of the late flyer whose name identifies the Michigan division of Vultee Aircraft Inc. The ceremonies were attended by several hundred employes of the division and were held inside the plant, the occasion also marking the award of the Treasury's bull's-eye flag to the 1200 employes of the company for subscribing better than 10 per cent of their earnings for purchase of war bonds.

In a stunt exhibition flight of the new liaison-type plane, or L-5 as it is called, it proved to be a worthy counterpart of its blood brothers, the land jeep and amphibian jeep. The L-5, or Sentinel, is a small, rugged, highly maneuverable plane, designed to "see what's cookin'" for artillery, tank corps, cavalry and infantry forces on the ground. Carrying a pilot and observer, and packed with radio equipment for communication with all types of ground units as well as with other planes, it can hover and maintain altitude at speeds below 45 miles per hour, while directing artillery fire or the movement of tanks or troops below. It is extremely stable, so that the pilot can concentrate on observation without fear of inadvertently stalling or spinning.

The rugged little ship is designed to go wherever ground troops go, to get in and out of a cow pasture or to set itself down on a highway. It can land or take off after an unusually short run and can climb at an exceptionally sharp angle to clear trees or other obstructions (see illustration). Its light weight and small size permit it to be pushed around easily and quickly concealed on the ground. Wing span of 34 feet, length 24 feet and six-cylinder horizontal-opposed engine of 190 horsepower, make the ship about one-third smaller than the L-1, pioneer "liaison" plane developed some time ago by Stinson.

In many battle operations, the Sentinel will replace the "sausage" observation balloons used in the last war. It can operate effectively low enough and cut its speed down slow enough to give it all the advantages of the balloon without becoming a fixed target for enemy fire.

Fuselage is made of welded chrome-molybdenum steel tubing, with wings and tail surfaces of wood, fabric covered. Inspection of an accompanying illustration shows the accentuated sweep designed into the tail fin, suggestive of the dorsal fin of the Flying Fortress, which has led some of the Stinson workmen to calling the ship the "flying tail." The design of this fin is acknowledged by aeronautical engineers to be an important aid in maintaining stability.

To conserve critical materials, the plane was redesigned just before it was put into production to make use of wood and other nonvital materials wherever practicable. This eliminated almost 20 per cent of the original steel requirement and almost 70 per cent of the aluminum.

Spectacular performance in takeoff, hovering flight and landing is a feature of the new liaison-type Stinson plane (upper photo) now being built in quantity for the air forces. Note the steep angle of climb as the ship leaps off the ground. The plane (lower photo) also is new and is a celestial navigation trainer being built for the Fleet Air Arm of the British Royal Navy. Essentially it is a military version of the former Stinson Reliant, a peacetime private plane

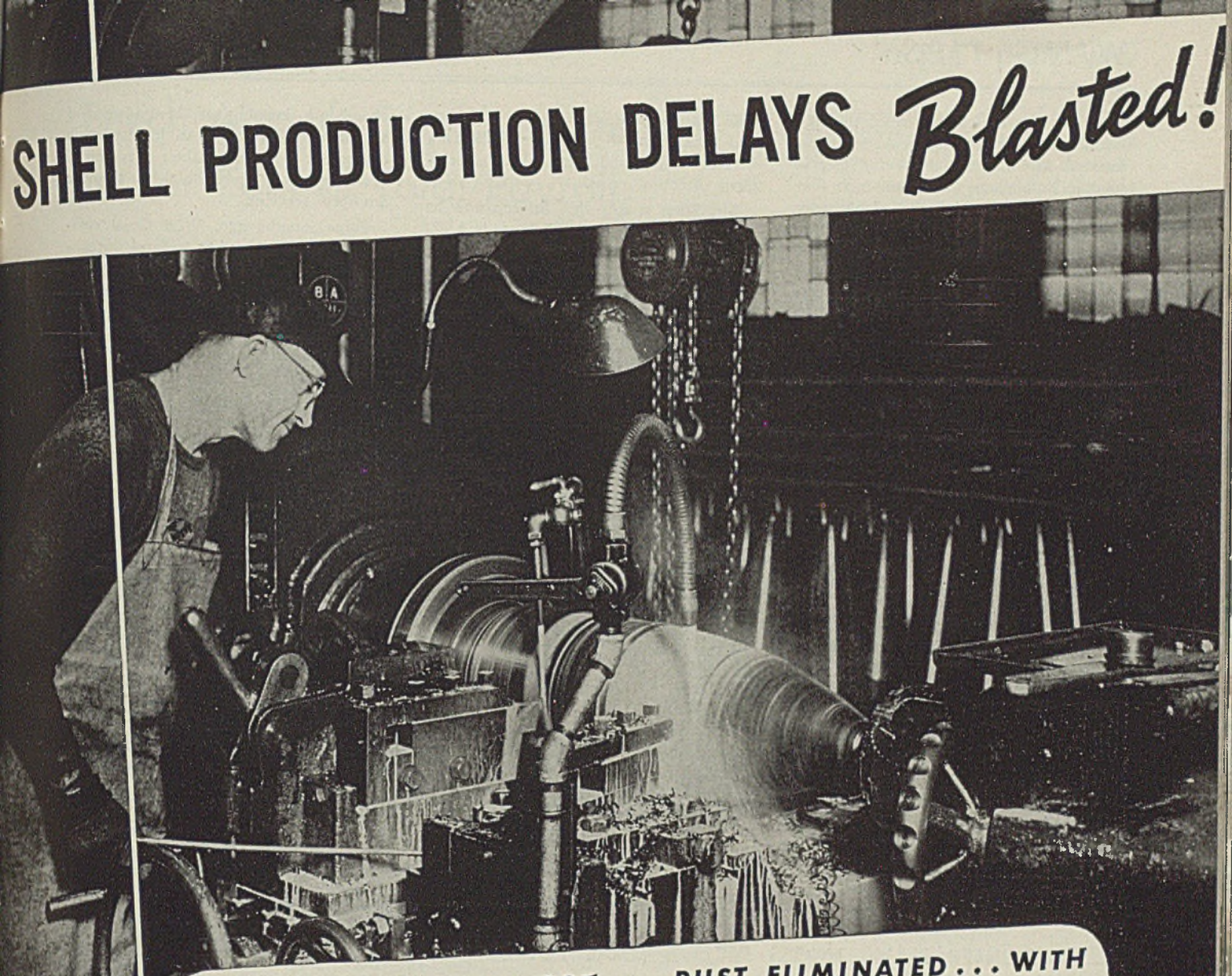
Has Best Safety Features

Stroke of the spring-and-oil shock absorbers has been lengthened to approximately double that of conventional types, to absorb landing shocks on rough terrain. Wing flaps and wing slots also are incorporated in the design to increase stability and, more importantly, to make possible the unusual performance in takeoff, landing and steep climbing. These features were employed in both the Stinson 105 and Voyager, earlier models built for private owners.

Coincident with the introduction of the L-5, another plane was christened at the Stinson plant, the AT-19, celestial navigation trainer built for the Fleet Air Arm of the British Royal Navy, under lend-lease agreement. This plane is essentially the peacetime Stinson Reliant, with its upholstered cabin removed and given over to radio, navigation instruments and related equipment. Weighing 4000 pounds, it has 42-foot wingspread, 30-foot length and is powered by a 290-horsepower Lycoming radial engine, with constant speed propeller. It is a high gulled-wing monoplane, of a similar type of construction to the L-5.

Fortunes of the Stinson company have

SHELL PRODUCTION DELAYS *Blasted!*



TOOL LIFE INCREASED 50% . . . RUST ELIMINATED . . . WITH SUNOCO EMULSIFYING CUTTING OIL

In one of America's largest armament plants, better shells are rolling off the production line faster because of the job Sunoco Emulsifying Cutting Oil and Sun Oil Engineers are doing.

Short tool life and a bad rust condition were retarding production. Tests were made with ten prominently-known soluble cutting oils to determine the best for their purpose. Sunoco was selected. At the suggestion of Sun Oil Engineers — those capable Doctors of Industry — a change also was made in the method of applying the soluble oil. Now tool life has increased approximately 50% . . . and the rust problem is a thing of the past!

This is typical of the service these Doctors of Industry and Sunoco Emulsifying Cutting Oil are rendering to industry in the drive for victory production. Remember these engineers . . . and the products they offer . . . are ready, willing and able to help you boost production in your plant. For helpful case histories of what they have done for other leaders in the metal working industry, write for your free copy of "Helping Industry Help America."

SUN OIL COMPANY • Philadelphia

Sun Oil Company, Ltd., Toronto

BUY WAR BONDS AND STAMPS

SUNOCO

SUN PETROLEUM PRODUCTS

HELPING INDUSTRY HELP AMERICA

had their ups and downs since the day Eddie Stinson and William A. Mara interested Detroit capital in building a small private plane in a plant near that city. First sketches of the plane were drawn on some plain brown wrapping paper by Stinson and shown to interested parties at the offices of the Detroit Board of Commerce. The company, and its founder, are accredited with a number of "firsts" in aviation manufacturing, including the first plane with enclosed cabin, first wheel brakes, electric starter, rubber motor mounts, and parking brakes. Eddie himself, at the age of 16, discovered how to pull a plane out of a spin, which up to that time had been considered a fatal maneuver, and he imparted his knowledge to amazed army air corps men in Texas. The expedient was nothing more complicated than pushing forward on the control stick instead of the instinctive pulling back when the plane went into the spin.

After a hesitant beginning, the Stinson company sold out to Erret Loban Cord when he was putting together his Aviation Corp. and in the subsequent reshuffling of this holding company after the departure of Mr. Cord, emerged as a division of Vultee, which along with numerous other aviation enterprises now makes up the Aviation Corp. These include Consolidated Aircraft, Lycoming, American Propeller, Liquid-Cooled Engine Corp., Republic Aircraft Products and a few lesser lights, over which Tom Girdler of Republic Steel holds the principal directing reins.

Mr. Mara is still with Stinson now as contracts administrator. Manager is A. E. Shelton. Recent additions to the plant facilities at Wayne have greatly improved the manufacturing potential, and further extensions are now in process which will give still greater productivity.

ACCA Ranks Depleted

Insiders are starting to sing requiems for the Aeronautical Chamber of Commerce, 22-year old trade association for the aircraft manufacturing industry, following the recent withdrawal of a number of West Coast manufacturers, and the more recent resignation of Col. John H. Jouett, president. The chamber has been the so-called "voice" of the airplane manufacturers, has kept its membership advised on legislative developments at Washington affecting aviation and more recently has organized a rather extensive program of standardization activity on parts and subassemblies.

Reportedly there has been growing dissatisfaction over an alleged ineffective job of publicity by the ACCA. West Coast companies have felt that their interests were being neglected in favor of the eastern companies, and complaints were registered over the slowness of the chamber in keeping members advised of Washington developments. In fact, some companies have placed their own men in Washington, or subscribed to separate advisory services.

Some months ago, West Coast companies banded together to form the Aircraft War Production Council, which has been eminently successful in the exchange of production information, in relieving materials bottlenecks and otherwise co-ordinating the activities of Douglas, Vultee, Consolidated, North American, Boeing, Lockheed-Vega, Northrop and Ryan companies there.

On Sept. 15, the council finished its first six months of operation, and Donald W. Douglas, then president, reported that during the period there were 4151 recorded instances of actual exchanges of material between member companies, and further that on specific requests the members interchanged 494 engineering reports, and freely delivered an additional 96 reports requested by nonmember companies. Council members likewise interchanged 619 index card references to technical reports. In 30 days alone the council staff prepared 109 reports outlining solutions to plant problems, these reports covering 21,117 mimeographed pages. Of the work, R. A. Lawson, Vultee works manager, said, "For altogether too long most of us have felt that our problems were peculiar unto ourselves and that in nearly every instance we, as individual companies, had arrived at the best solution for these problems. It was quite a revelation to discover that nearly all of the member companies were experiencing similar difficulties and a further revelation to learn that there were other and admittedly better methods of attacking the situation than those devised by ourselves."

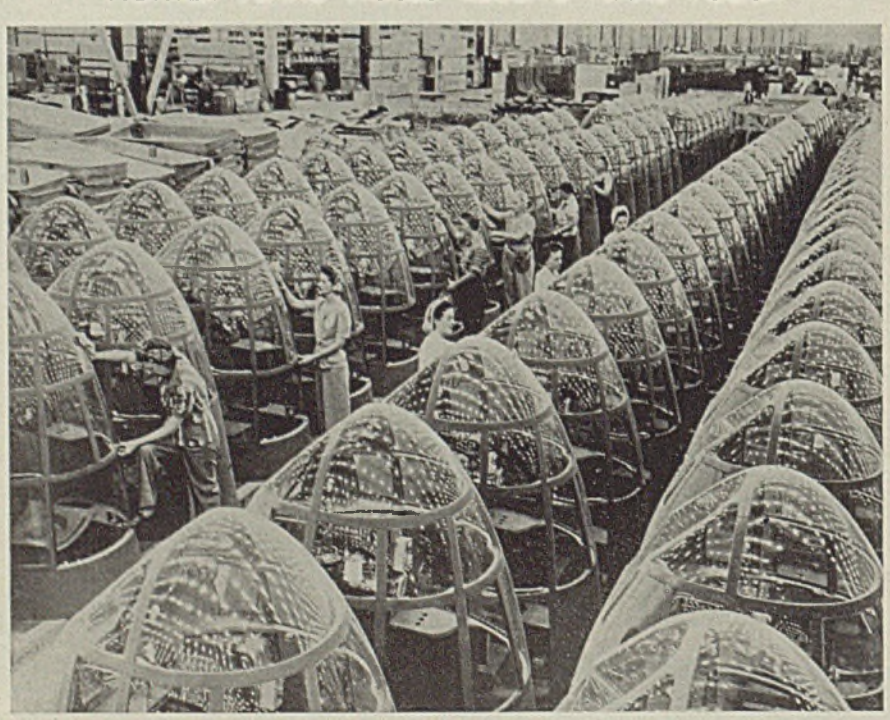
Tasks Too Great

In a situation like this, it would perhaps have been the province of the Aeronautical Chamber to step in and supply pooled information and data, but it was too late then. After all, the aviation manufacturing industry has expanded to 15 or 20 times its former size almost overnight, and for an old established trade association and its staff to cope with the problems incident to such an expansion is no simple task.

Meanwhile, disaffection had spread through some of the eastern aircraft builders with the result that they organized the Eastern Division of the Aircraft War Production Council, and extended its activities even beyond those of the Western Division. It is understood some of these companies, too, have dropped from the ACCA. The two divi-

(*Please turn to Page* 131)

FIGHTER PLANE NOSES RECEIVE FINAL POLISH



PLEXI-GLASS noses of fighter planes reflect overhead plant lights in this striking view in Douglas Aircraft Co. Inc., Long Beach, Calif. An all-women crew is giving the parts a final polish. NEA photo

Beech Aircraft Employes Pledge 16 Per Cent of Total Payroll

Typical of Beech Aircraft Corp.'s campaign were these, top, 200 per cent posters

—o—

Inspection Department at Beech Aircraft stressed the competitive spirit by pitting the various offices against each other, middle, in the War Bond campaign

—o—

"Buy Bonds to Buy These for Tokyo" reads one poster in a Beech Aircraft department. This campaign was dubbed the "Bundles for Tokyo" by Beech employes

WINNING of the United States Treasury's "T" banner which flies over the plant of Beech Aircraft Corp. at Wichita, Kans., marked the end of the first phase of company's War Bond sales campaign and the beginning of a period of intensified effort on the part of employes to exceed the 16 per cent of total payroll deduction rating which placed Beech Aircraft high on the industrial Roll of Honor.

Except for an initial push from the labor-management production drive committee, the campaign has been fostered, enlivened with fresh ideas and pressed forward in a series of successes by the workers themselves. That they have done a good job is attested by the fact that over half of the personnel are now enrolled in "200 per cent" clubs, wherein the individual pledges amount to 20 per cent of the employe's pay check, 10 per cent being subscribed under the payroll deduction plan and another 10 per cent being paid in voluntarily to a separate bond-buying fund operated by the Beechcraft Employes Club, an exceptionally active group responsible for the impressive results so far obtained.

War Spirit Bolsters Drive

Because the firm has long been engaged in mass production of basic training planes for the Army Air Forces, the war spirit which pervades the entire organization was relied upon by officials to sustain enthusiasm for the drive. Following the announcement of the campaign, the Employes Club offered a roving Victory Trophy to the department buying the largest percentage of bonds and stamps each week in addition to the regular purchases through 10 per cent wage deductions. Any division winning for four consecutive weeks was allowed to keep the trophy. The idea was so well received that every department in the company entered the competition.

To spur their people to greater efforts, heads of several divisions adopted appropriate symbols of purpose; other exhibited graphic charts to show their progress. Buying stamps and bonds "By the Barrel" became the watchword in the sheet metal shop, where an empty beer

keg was set up under a placard reading "Buy a Stamp Instead of a Beer."

One department exhorted members to "Buy Bundles for Tokyo," hanging an unloaded bomb in its bay to get across the meaning. An inspection department mounted a board with a series of thermometer-type graphs recording percentages of payroll deductions for each subsection of the department. It bore the inscription, "Bond Buying Is Another Way of Whipping the Axis!" A social group in the Employes Club sponsored a party with door prizes of one $50 and one $25 War Bond.

Taxes the Alternative

Lacking shibboleths and displays, one matter-of-fact supervisor called his charges together and bluntly informed them that there were two ways for the government to raise money to win the war—one through voluntary contributions in the form of bond purchases, the other through direct taxation. He made his point.

The intense interdepartment competition and good publicity given it by the *Beech Log*, employe publication, caused spirited bidding for the roving trophy. The first winner, the maintenance department, had bought an average of $35 worth of War Savings stamps a week since two months before the contest opened, but even this rate was not high enough to hold it.

Within a few weeks, departments were reporting average individual subscriptions, above the 10 per cent of payroll, totaling $22.56 and $24.45 per week. A single department pledged $7500 in one week's campaign, exclusive of earlier pledges to the company. Men who won cash prizes from the war drive committee for production improvements were appealed to by co-workers to use the money for bonds to build up the department's average.

New fathers bought stamps for family "additions." Many of the older men dipped into cash savings to purchase bonds in $1000 denominations. Donations for "happy landing" presents in War Bonds for Beecherafters who enlisted swelled the fund.

When the position planning division took the first roving trophy out of circulation after five weeks' competition, the Employes Club prevented the drive from losing momentum by putting up another trophy. By August total plant-wide sales had reached $18,500 per month, each month showing an increase.

In September the 200-per-cent departments numbered ten, with likely candidates in the 20-per-cent class appearing weekly. To encourage this special group and give further stimulus to the program, the war drive committee honored each section which qualified with an official "Minute Man" flag bearing its number and a 200 per cent designation.

It is understood at Beech Aircraft that the campaign will be continuous until victory is won, no matter what new goals are reached. The attitude of most of the employes is typified by their rallying cry, "We build 'em and we can pay for 'em."

AWARDS BONDS MONTHLY FOR PRODUCTION IDEAS

AWARD of prizes for useable suggestions from employes is a monthly feature with the War Production Drive Committee at Reliance Electric & Engineering Co., Cleveland. R. W. Cornell, left, superintendent and committee chairman, is shown presenting war bonds and stamps to the winners, Henry Reitenbach, electric motor tester, Henry Kurtz, tool and die maker, and William Maize, motor repair man, whose suggestions resulted in saving time and improving methods in their departments

Modified Edison Plan Proposed for Bond Sales

A slight modification of a "Liberty Loan" plan proposed to the United States Treasury Department by Thomas A. Edison in World War I has been put before the New Jersey state legislature in the form of a resolution adopted by the War Activities Committee, Industrial Marketers of New Jersey. It would give New Jersey industrial firms an opportunity to increase the sale of war bonds by offering bond prizes to their workers who purchase bonds.

Edison proposed that every purchaser of a "Liberty Loan" bond be given an opportunity to participate in a nation-wide drawing for a bond sum of considerable size, up to $700,000. The new plan would give each war bond buyer in the plants adopting it an opportunity to participate in company drawing for various denominations of bonds, without risk of loss of money as in the case of a lottery. Since the original purchase of a bond constitutes eligibility for the drawing, it is said there is no possibility of loss such as might be incurred in a lottery. John F. Coakley is chairman of the committee. Headquarters of the Industrial Marketers of New Jersey are at 44 Commerce street, Newark.

October Sales, $814,000,000; $39,000,000 Over Quota

October sales of War Bonds totaled $814,000,000, exceeding the month's quota by $39,000,000. This, however, was a decrease from September sales of $822,000,000.

Series E bond sales increased from $546,000,000 in September to $588,000,000 in October, indicating the growing effectiveness of payroll savings plans.

Total War Bonds outstanding now approximate $10,000,000,000.

Needs More U. S. Steel for Ships; Vickers Naval Gun in Production

TORONTO, ONT.

MERCHANT shipbuilding has been increased steadily and is believed to be near the peak, unless a larger supply of steel is made available. Canadian steel production is close to capacity, and plate mills are operating above rated capacity. Efforts are being made to obtain more steel from the United States.

C. D. Howe, minister of munitions and supply, reports that so far this year Canadian shipyards have delivered more than 60 steel cargo ships, totaling 634,000 tons deadweight. This compares with 63 ships of 380,140 deadweight tons during the first world war, some of which were not completed until 1920.

One of the 10,000-ton ships delivered this year was built in 88 days. The fastest time in the former war was 91 days for an 8800-ton ship. Both records were made by British Columbia yards.

Department of Munitions and Supply announces that Vickers 5-inch naval machine guns now are being produced in Canada. This is the twelfth type of small arm made by Canadian industry, other types including army rifles, machine guns, training rifles, submachine carbines, antitank rifles, aircraft and tank machine guns, mortars, tank bomb throwers and smoke dischargers. Weighing more than 75 pounds, the new Vickers guns fires about 600 rounds of half-inch bullets per minute. It is designed for use on ships for protection against aircraft.

Mr. Howe has been made a full member of the Combined Production and Resources Board. Other members of this board are Donald M. Nelson, chairman, United States War Production Board, and Oliver Lyttelton, British Minister of Production. Main purposes of the board are "to combine production programs of the three countries into an integrated whole, adjusted to strategic requirements of the war." Mr. Howe has appointed E. P. Taylor, Toronto, his deputy on the board. Since the latter will devote most of his time to this duty he will not be able to assume the duties of president of War Supplies, Ltd., to which he was appointed in October.

Canadian war production secrets, designed to save materials, machines and manpower, will be pooled for the benefit of all industry through a special committee working under H. J. Carmichael, production co-ordinator, with C. B. Stenning of the subcontract division as chairman. It will be composed of representatives of production branches and control divisions. Conservation methods developed in any plant or any specific branch of war industry will be made available to all industry wherever they can be used.

Department of Munitions and Supply has appointed a nonferrous castings advisory committee for Canada. It will be headed by G. C. Bateman, metals controller, and F. M. Connell, deputy metals controller.

Two companies at Hamilton, Ont., are scheduled to go into production of bonderized steel this month, to relieve demand for tin plate. Used with a lacquer coat it is a substitute for tin plate for certain products. Further restrictions on tin use have been imposed by the metals controller, tin content of solders being reduced from 38 to 30 per cent. After Dec. 31 tin cans will be soldered with an alloy containing 2½ per cent silver and 97½ per cent lead.

Financial arrangements are virtually completed and work will be started soon on development of iron ore mines in the Atikokan section of Ontario by Steep Rock Iron Mines Ltd. About $6,000,000 will be required. The Canadian government will provide about $2,500,000 additional for power lines, dock facilities and railroad spurs.

KAISER SHOWS HOW SHIPBUILDING SPEED IS ATTAINED

HENRY J. KAISER, second from left, demonstrates how Liberty ships are built in a hurry while Douglas P Falconer, left, national executive director of the United Seamen's Service, Rear Admiral Albert Randall, right on platform, and a group of seamen from a torpedoed vessel look on. Mr. Kaiser is using an 81-piece model, 14 feet long and 4 feet high of a 10,400-ton freighter which was built in 4 days, 15 hours and 25 minutes at his California yards. NEA photo

Steep Rock Hard Ore Tested in Open Hearth

Test of "hard" iron ore from the Steep Rock Lake deposit in Ontario was made last week in open hearths of Republic Steel Corp. at Buffalo, with satisfactory results. Ore of this type is used as charge in open hearths to reduce carbon. The Steep Rock ore is reported to contain 61 to 65 per cent iron and in the test carbon reduction was said to be 85 per cent.

Cyrus S. Eaton, who was one of the organizers of Republic Steel Corp., stated after the test that the Steep Rock deposit, at the bottom of a lake 130 miles west of Fort William, Ont., "probably contains 100,000,000 tons of ore." After a year's work in draining the lake and developing the mine, he said, it is believed 1,000,000 tons can be produced in 1944 and double that tonnage in 1945. The Canadian government is preparing to spend several million dollars developing the mine, he told newsmen.

RFC Spending Ten Billions for New Plants, Mineral Stockpiles

TOTAL commitments by the Reconstruction Finance Corp. and two subsidiaries, Metals Reserve Co. and Defense Plant Corp., approximate $10,000,000,000, Charles B. Henderson, MRC president, told members of the American Mining Congress meeting in Salt Lake City, Utah, last week.

Commitments for metals and minerals amount to $3,990,038,900 while more than $6,000,000,000 has been authorized by DPC in other war activities.

DPC has a program involving more than $2,000,000,000 for the creation or expansion of facilities to increase domestic output of vitally needed minerals and metals. A substantial part of this is the new aluminum and domestic bauxite production program.

In Washington, Mr. Henderson reported that MRC's tin smelter at Texas City, Tex., is producing refined tin well in excess of 18,000 tons a year and soon will be expanded to handle all the tin ore available to the United Nations.

The smelter has been producing commercially acceptable tin since April 5, according to Mr. Henderson, and in all probability will operate after the war.

To Handle All Available Ore

Expansion of the plant to handle all the ore obtainable from Bolivia, Belgian Congo, China, Nigeria and other sources now open to this country is necessitated by the possibility of smelters in those countries being incapacitated by enemy action.

Mr. Henderson told the mining congress that DPC commitments for chrome now amount to $16,077,000. Chrome production will be increased 38 times over domestic output in 1941.

For the production of copper, lead and zinc, DPC has made commitments of nearly $72,000,000; for iron and steel, nearly $800,000,000; for magnesium, more than $370,000,000; for manganese and ferromanganese, $7,250,000; and for nine other metals (tin excluded), about $72,000,000.

"It is through MRC, with aggregate commitments, exclusive of foreign purchases, of $1,787,693,300, that the sharpest contact with and stimulation of domestic production is maintained," Mr. Henderson said.

"Its premium purchase program is well on its way to stimulating production of copper, lead and zinc from 2500 mines in 27 states.

"MRC through contracts, has stimulated manganese production to eight or ten times the prewar output. It has entered into 145 domestic contracts for high-grade ore—17 for the delivery of 10,000 tons or more—and it has liberalized practice respecting minimum grades to encourage the utmost production."

In addition to certain large developments in Montana and Alaska, MRC has contracted to purchase more than 480,000 tons of chrome ore from domestic producers under 67 contracts. Five of these call for 10,000 tons or more.

The RFC subsidiary also has contracts for large tonnages of tungsten concentrates, and has put into effect a plan reaching small producers which has resulted in production being more than doubled since last year.

"With respect to other minerals and metals the purchasing program of MRC is encouraging the small producers—if able to deliver only one truck load—to do their part in the war program.

"This company has at the present 20 engineers in the field at strategic points throughout the mining areas to facilitate and expedite the technical processes involved in the purchase program and in establishing stockpiles."

MRC's own organization is a very small one, Mr. Henderson commented, "particularly when considered in relation to the extent of its activities, and the volume of its business." Indirectly, however, hundreds of highly qualified mining men are helping the organization carry out its work.

Regular mining companies are able to produce more promptly and more effectively than could a government organization, Mr. Henderson said. "From the start, therefore, MRC has avoided trying to do its own operating, but instead has farmed out this work among the mining companies best qualified to handle it, and it is the latter who, as agents for MRC, have the conduct of this work in mind.

"It has always been our belief that the government should neither compete with, nor attempt to parallel the work of industry, but should instead enlist the help of industry wherever industry is better qualified to act."

Aluminum Expansion Program Speeded; New Projects Added

Expansion of aluminum producing capacity has been accelerated and a number of new projects have been added to the original program, a spokesman for the War Production Board said last week.

The first program decided upon in November, 1941, and providing for 850,000,000 pounds of additional capacity has been completed, he said, and plants in the second program are beginning to come into operation. Contracts for the second program, providing for an increase of 600,000,000 pounds of capacity, were signed in February and March this year.

The second program, however, has been running as much as two months behind schedule due to lack of materials for construction purposes and for equipment. As a result, he said, it has been necessary to assign AA-1 ratings to equipment for the new plants and AA-2-x for construction materials. Previously, the ratings were AA-3 and AA-4.

Both programs, of course, included necessary fabricating facilities but these since have been augmented by additional forging and sheet mill equipment. All new plants are expected to be in full operation early next year.

It is estimated that at least 3,000,000,000 pounds of aluminum, including 600,000,000 pounds of secondary, will be available for consumption in 1943. It was stated that already sufficient metal is being produced to meet direct military requirements.

Defense Plant Corp. Lets More War Plant Contracts

New war plant facilities and equipment have been authorized by the Defense Plant Corp., Reconstruction Finance Corp. subsidiary, Jesse Jones, secretary of commerce, announced last week. The facilities will be operated by private companies, and title will be retained by Defense Plant Corp. in each case. Contracts include:

Execution of contract with Dow Chemical Co., Midland, Mich., to provide for the construction and equipment of a plant in Texas, at a cost in excess of $2,500,000.

Execution of contract with H. K. Ferguson Co., Cleveland, to provide for the construction and equipping of a plant in California. The cost is estimated to be in excess of $1,500,000.

Execution of contract with H. K. Ferguson Co., Cleveland, to provide for the construction and equipping of a plant in Texas, at a cost in excess of $1,000,000.

Execution of contract with Vulcan Detinning Co., Sewaren, N. J., to provide for the construction and equipment of a plant in Pennsylvania, at a cost in excess of $600,000.

Execution of contract with Vanadium

Corp. of America, New York to provide plant facilities in Pennsylvania. The cost is estimated to be in excess of $750,000.

Execution of contract with Maryland Sanitary Mfg. Corp., Baltimore, to provide plant facilities, at a cost in excess of $1,250,000, in Maryland.

Execution of contract with Erie Resistor Corp., Erie, Pa., to provide plant facilities in Pennsylvania. The cost is estimated to be in excess of $275,000.

Execution of contract with Withers Gem & Mining Corp., Atlanta, Ga., to provide machinery and equipment in Georgia.

Execution of contract with Odenbach Shipbuilding Corp., Rochester, N. Y., to provide plant facilities in New York, at a cost in excess of $400,000.

An increase in its contract with Chrysler Corp., Detroit, for additional machinery and equipment in Michigan. The increase will be in excess of $75,000, making a total commitment in excess of $1,800,000.

An increase in its contract with Ford Motor Co., Dearborn, Mich., for additional machinery and equipment in Michigan. The increase will be in excess of $250,000, making a total commitment of more than $10,250,000.

An increase in its contract with Bridgeport Brass Co., Bridgeport, Conn., to provide additional equipment in Indiana. The increase will be in excess of $1,000,000, making a total commitment of more than $18,000,000.

Two Maritime Commission Ore Carriers Launched

Two of the 16 Great Lakes iron ore vessels being constructed for the Maritime Commission were launched recently at American Shipbuilding Co. yards, the THOMAS WILSON in Lorain, O., Nov. 14 and the BELLE ISLE in Cleveland Nov. 15.

The ships have an overall length of 621 feet, beam of 60 feet and depth of 35 feet. Each will carry approximately 16,000 gross tons of iron ore.

Six of the vessels are being built by American Shipbuilding Co., two at Cleveland and four at Lorain, and ten by the Great Lakes Engineering Co., six at River Rouge, Mich., and four at Ashtabula, O.

These vessels will add approximately 240,000 tons to the trip capacity of the Great Lakes fleet next season. A score or more of small and medium-size vessels also will be made available for the coal, stone and other trades next season.

The BELLE ISLE is the largest vessel ever to be built in a Cleveland yard and the first ore carrier to be built there since the building of the 600-foot CHARLES M. SCHWAB in 1923. It was the first Sunday launching of a big lakes boat since World War I.

RFC Authorizes Loan To Develop Iron Ore Property

Reconstruction Finance Corp. has authorized a loan of $3,000,000 to the Lake Mining Co., St. Paul, Minn., for development and mining of open-pit ore in Minnesota. Company is to provide an additional $2,500,000, making a total of $5,500,000 for the project.

The property contains 24,000,000 tons of high-grade ore, of which 14,000,000 tons can be mined by the open-pit method.

Foundrymen Assisted with Special Wartime Problems

Chicago chapter, American Foundrymen's Association, has organized a War Problems Committee, function of which will be to assist members and foundrymen of the area generally on all problems of a technical or general nature relating to the production of castings, excluding wage-hour matters and labor relations.

The committee includes members from the several divisions of the industry—gray iron, steel, malleable, brass, bronze, aluminum, magnesium—and its primary purpose is to clarify and expedite any situations hampering the war effort as foundrymen. The committee will act in this same capacity for the local ordnance, WPB and navy offices.

E. R. Young, Climax Molybdenum Co. is chairman of the committee; L. L. Henkel, War Production Board, is vice chairman; and N. F. Hindle, American Foundrymen's Association, 222 West Adams street, Chicago, is secretary.

Other members of the committee are: Steel, L. H. Hahn, Sivyer Steel Casting Co., F. S. Sutherland, Continental Roll & Steel Foundry Co.; Cast Iron, John H. Gellert, Nichol-Straight Foundry Co., L. H. Rudesill, Griffin Wheel Co.; Malleable, W. D. McMillan, International Harvester Co., Leon J. Wise, Chicago Malleable Castings Co.; Brass and Bronze, Chester K. Faunt, Christensen & Olsen Foundry Co., H. M. St. John, Crane Co.; Aluminum, George H. Starman, Apex Smelting Co.; and Magnesium, Gordon H. Curtis, Dodge Chicago plant, Chrysler Corp.

September production of steel barrels and drums totaled 1,837,972 units, compared with 1,822,909 units in August and 1,712,681 units in September, 1941.

DEDICATE INLAND'S NEW BLAST FURNACE

INLAND Steel Co.'s new No. 6 blast furnace was blown in Nov. 16, at a special ceremony held in its Indiana Harbor, Ind., plant. The button starting the furnace in operation was pressed by Mrs. Henry Straus of Glencoe, Ill. (with flowers), daughter of the late P. D. Block, one of the founders of the company and at the time of his death chairman of Inland's executive committee. At the microphone is Wilfred Sykes, Inland president, and to his left, front row, E. L. Ryerson, chairman of the board of directors. At extreme left is J. H. Walsh, vice-president in charge of operations at Indiana Harbor for Inland. (See also STEEL, Nov. 16, p. 50)

MEN of INDUSTRY

A. H. PHILPOT

A. G. BISHOP

W. E. GRIFFITHS

A. H. Philpot, metallurgical engineer, has been appointed by Copperweld Steel Co., Warren, O., to manage the Washington district office. He will be active in the sale and application of the company's alloy and tool steels.

—o—

A. G. Bishop, roll engineer, Republic Steel Corp., Cleveland, has retired after 43 years with Republic and its predecessor company, Republic Iron & Steel Co. He will live in New London, O.

—o—

Robert A Murdock, the past two and one half years associated with Jones & Laughlin Steel Corp., Pittsburgh, as instrument man, has joined the Indianapolis office of Claud S. Gordon Co., Chicago, as service engineer.

—o—

Roy C. Yantis has joined the development engineering staff of Wolverine Tube Division, Calumet & Hecla Consolidated Copper Co., Detroit, as a mechanical engineer. He formerly was associated with the Gibson Refrigerator Co., Greenville, Mich.

—o—

James G. Parks, since Aug. 1, 1941, associated with American Steel Warehouse Association, Cleveland, has resigned to become personnel manager, Erie Resistor Corp., Erie, Pa.

—o—

Carl A. Salmonsen has been appointed assistant manager, River Works, General Electric Co., Lynn, Mass. Associated with General Electric 33 years in various supervisory capacities, Mr. Salmonsen has been in charge of one of the manufacturing divisions at the Lynn Works since 1941.

—o—

John W. Hanes, former under secretary of the treasury, has become a director of Worthington Pump & Machinery Corp., Harrison, N. J. Mr. Hanes, founder and vice president of Hanes Rubber Co., is a director of a number of other companies in diversified industries.

—o—

George B. Wadlow, for more than 25 years associated with Continental Roll & Steel Foundry Co., East Chicago, Ind., in purchasing, production and sales capacities, has been made assistant to the president, Continental Ordnance Corp., the $50,000,000 subsidiary of that company.

—o—

Bert C. Brand has been appointed comptroller, Vanadium Corp. of America, New York. **Lawrence C. Miller** has been elected assistant treasurer, and **Harry E. Orr,** assistant to vice president in charge of operations.

—o—

Robert C. Mathewson has been named assistant manager, Chicago branch office of American Bosch Corp., Springfield, Mass. Mr. Mathewson was formerly assistant chief engineer of the Engine Division, Buffalo works, Worthington Pump & Machinery Corp.

LAUSON STONE

Who has resigned as assistant to the president of Jones & Laughlin Steel Corp., to become president, Follansbee Steel Corp., Pittsburgh, as noted in STEEL, Nov. 9, p. 45

—o—

W. E. Griffiths, formerly manager, product development department, Allegheny Ludlum Steel Corp., Pittsburgh, has been appointed assistant manager of sales, flat rolled products.

—o—

J. A. Jones, president, Jones Bros. Structural Steel Co., Ravenna, O., has been elected a state senator from the twenty-fourth and twenty-sixth Ohio senatorial district, comprising Ashtabula, Lake, Geauga, Portage and Summit counties.

—o—

Angus C. Scott has been appointed sales manager of the Derry, Pa., porcelain department of Westinghouse Electric & Mfg. Co., succeeding **R. L. Whitney,** who has become sales manager, Westinghouse Transformer Division, Sharon, Pa. Mr. Scott was formerly manager of the Line Material Section, Transportation and Generator Division at East Pittsburgh, Pa., a post he held since 1937.

A. C. Farmer, formerly assistant sales manager, Transformer Division, has been named assistant to the vice president, and **A. P. Bender,** heretofore sales manager, has been made assistant sales manager "to afford the best possible opportunity for his complete recovery" from an extended illness.

Chester D. Moore has been named industrial relations manager, Sharon Transformer Division, replacing **J. T. Burke,** who has been transferred to the Canton Division. Heretofore, Mr. Moore

has been supervisor of industrial relations at the Merchant Marine Works of Westinghouse's South Philadelphia plant.

—o—

Lester M. Cole, district manager at Houston, Tex., for Warner & Swasey Co., Cleveland, has been elected a director, American Society of Tool Engineers from region No. 17 for a two-year term.

—o—

Harry W. Woodhead, president, Consolidated Aircraft Corp., San Diego, Calif., has also been elected president of Vultee Aircraft Inc., Downey, Calif., succeeding **Richard W. Millar,** resigned. **I. M. Laddon,** vice president and general manager of Consolidated, has been elected vice president of Vultee. Both men will retain their present positions.

—o—

J. E. von Maur, 63 South High street, Columbus, O., has been appointed representative in Ohio for American Gas Furnace Co., Elizabeth, N. J. Mr. von Maur will also maintain an office at 715 Prospect avenue, Cleveland. The Verkamp Corp., Cincinnati, will act as Mr. von Maur's sub-representative in southwestern Ohio.

—o—

William Reynolds has been named advertising and public relations manager, Elastic Stop Nut Corp., Union, N. J. He was formerly advertising manager of Servel Inc., Evansville, Ind.

VETERAN GREETS VETERAN, IN BILLION-DOLLAR WAR PROGRAM

CALLED back from retirement by pressure of the war production program, Gerard Swope, 70-year-old president of General Electric Co., Schenectady, N. Y., greets another veteran, Thomas Darrow, employe with 30 years' service, while inspecting a marine gear plant at one of the company's major works. Mr. Swope returned to the job after Charles E. Wilson, president since 1940, was called to Washington to become top production authority of the War Production Board. During the first World war Mr. Swope won the Distinguished Service Medal for his work on the General Staff of the United States Army and was described by the late Charles A. Coffin as "the greatest organizer I have ever known." General Electric this year will produce a billion dollars worth of war equipment, three times its normal peacetime output

OBITUARIES . . .

J. Reid Evans, 74, treasurer, Sharon Steel Corp., Sharon, Pa., died Nov. 7, in Tucson, Ariz. He began his career with the LaBelle Steel Co., in 1909 becoming associated with the Sharon organization.

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William Salt, associated with De Laval Steam Turbine Co., Trenton, N. J., over 40 years, and for many years head of the service department, died Oct. 31.

—o—

John J. Klein, 32, assistant secretary, Marmon-Herrington Co., Indianapolis, died Nov. 11 He was a member, Society of Automotive Engineers Inc.

—o—

Philip A. Geier, 65, founder and chairman of the board, P. A. Geier Co., Cleveland, died Nov. 12 in that city.

—o—

Alexander Ross Robertson, 54, widely known in Canadian and United States industrial and engineering circles, died in Toronto, Ont., Nov. 5. At the time of his death he was Ontario division manager, Dominion Bridge Co. Ltd.

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Bennet B. Bristol, 74, who with his brother founded the Industrial Instrument Co. in 1908, which later became the Foxboro Co., Foxboro, Mass., died at his summer home in Falmouth Heights, Mass., Nov. 10. He served the Foxboro Co. as treasurer.

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Harry Pond Townsend, 67, president, H. P. Townsend Mfg. Co., Hartford, Conn., and holder of many patents on mechanical devices, died Nov. 13 in Hartford. Before organizing his own company in 1908 he was associated with New Departure Mfg. Co., Russell & Erwin Mfg. Co., and Crobin Cabinet Lock Co.

—o—

George E. Hodson, 89, retired president, Winchester Repeating Arms Co., New Haven, Conn., died Nov. 13 in New Haven. He became president in 1911, and retired four years later.

—o—

H. A. Stringfellow, well known engineer, associated with the Boston office, War Production Board, died Nov. 4, in Boston. From 1926 to 1930 he was engaged in developing compacting presses for rounding and compacting cables for the George Washington bridge, and following that was in charge, Special Machinery Division, Elevator Supplies Co. In 1935 he started research work on back pull drawing, from which the present reactive wire drawing method was developed.

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Elliott A. Burke, 76, who retired 11 years ago as secretary and sales manager, Hibbard, Spencer, Bartlett & Co., Chicago, died in Oak Park, Ill., Nov. 14.

—o—

Harry A. Post, 73, retired manufacturer and founder of the Ohio Mfg. Co., steel factory equipment, Painesville, O., died Nov. 8, in that city.

Production of copper bars in Chile in 1941 was 435,527 metric tons, almost 30 per cent more than the 1940 total of 337,700 tons, according to official figures. In 1939 output was 327,194 tons.

Railroads Advised To Improve Training, Personnel Programs

OTTO S. BEYER, director of the Division of Transport Personnel in the Office of Defense Transportation, last week called upon railroads "to tackle their rapidly growing labor shortages through an increased use of women employes, centralization of personnel activities, and modernization of training programs."

Announcing the results of a survey of 101 railroads, representing 97 per cent of all Class I railroad employment, Mr. Beyer asserted railroads had been slow in hiring women and improving personnel and training programs. For example, only 40,000 women—34,000 of them in clerical jobs—now work for the railroads, as against 100,000 in the first World War.

The carriers participating in the survey reported 60,000 vacancies as of Sept. 15. This figure, he explained, does not indicate that there were 60,000 vacancies which could not be filled, since all large railroads normally have many openings from time to time. Many reported vacancies were part of a normal turnover.

However, "the figure is sufficiently large to reveal a real and critical shortage of railroad labor. Responses to the survey, moreover, specifically indicate that the carriers are encountering extreme difficulties in meeting many shortages."

Few Have Training Programs

The survey disclosed that railroads are just beginning to resort to comprehensive training programs as a means of easing their critical labor situation. Of the 101 railroads covered, 47 reported no organized training programs, and many of the others only very limited projects.

Mr. Beyer pointed to two obstacles to improved training programs. One, he said, is the accepted railroad practice to decentralizing personnel functions, which, he said, makes a systematic attack on training problems difficult. Only a few carriers, the report showed, have an office or single official charged with training responsibility for their entire roads. Most of the carriers, therefore, do not have a complete picture of their training requirements and problems.

Mr. Beyer listed as the second barrier, the traditional railroad concepts of training itself, according to which the new employe starts at the bottom and picks up his occupational education through years of experience on the job.

"Whatever the merits of this practice in peacetime," he said, "it is clearly inadequate in time of war, when training must be accelerated to meet urgent manpower shortages."

The survey indicated that these obstacles are being surmounted by some railroads, which are overhauling their training programs to meet the situation.

"No Distinction Between Men, Women" on Many War Jobs

Women are replacing and supplementing men in many war industry jobs "without change or interruption in factory processes," according to Miss Mary Anderson, director, Women's Bureau, United States Department of Labor. She said surveys made by the bureau show that "no real distinction exists in war industries as to what constitutes a man's or a woman's job." It is not uncommon for a job to be performed by a woman on the day shift with men taking over on the night turn.

Increased use of women is found in the tool rooms of plants where practically no women were employed a year ago They are now working on cutters, reamers, gages, jigs and fixtures. Preliminary report shows the largest proportion of women so employed are in the fire-arms and cannon industry, where they operate all types of machine tools. Machine tool plants are using women on operations for making machine-tool attachments. cutters and broaches, with some prospect of their employment on production of parts and more difficult operations. Women are now working in every department of the large aircraft assembly plants.

In addition to surveys of machine tool, fire-arms and cannon, aircraft, ammunition and war instruments industries. occupations in shipbuilding now are in process of analysis by the bureau to determine the extent to which women may be used.

Total Employment 4,000,000 Above Peacetime Labor Force

Total civilian and military employment in September advanced to an all-time peak of 59,200,000 as 1,200,000 new workers were added in industry, the armed forces and farms.

Almost 4,000,000 more persons are at work or in uniform than would compose the peacetime labor force.

Present employment is 10,000,000 more than in 1940 and 4,500,000 above 1941.

Manufacturing industries added 250,000 new workers in September to bring the total to 15,300,000. More than 600,000 were added by the service industries, including the armed services.

Nonmilitary employment by the federal government increased by about 100,000 in September, raising the number of civilians so employed to 2,600,000.

Girl Workers at G-E Plant Start "Back-to-School"

Girl workers at a New England plant of General Electric Co. have launched a voluntary back-to-school movement to help them do their jobs better and faster. The idea stemmed from an "All Out War Production Suggestion" made by Mrs. Lillian Driscoll, screw-machine operator.

High school instructors, paid with Federal Educational Program funds, teach the classes which meet twice weekly in 1½-hour sessions for 18 weeks. Announcement of the course brought 254 applications for enrollment from girl workers who want training in fine machine work and inspection. Subjects include mathematics, blueprint reading and use of measuring instruments and gages.

Problems faced by industry in replacing men with women were outlined recently by Miss Lucy O. Norton, assistant supervisor of personnel at General Electric's Erie Works. She listed six cardinal points.

1.—Establishment of a fair rate of pay for a woman performing a man's job.

2.—Determination of the types of work on which they can be successfully employed.

3.—Setting up a satisfactory schedule of working hours.

4.—Adoption of good health and safety standards.

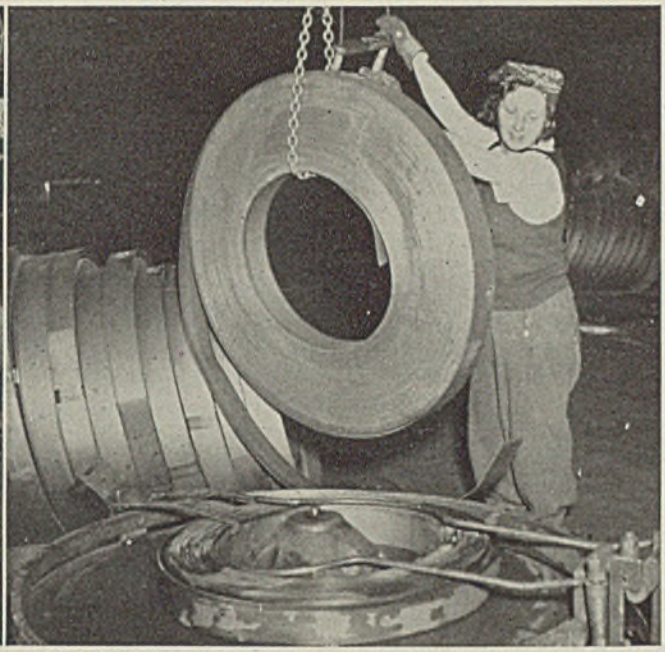
5.—Development of a simplified training program.

6.—Provision by the community of adequate care of dependent children of employed mothers.

Victory Pin Recognizes Wives, Mothers for Men's Efficiency

In recognition of the part taken by wives and mothers in maintaining the efficiency of men employed at Cleveland Automatic Machine Co., A. L.

REPLACE STEEL MILL WORKERS



EMPLOYMENT of 23 slack-wearing women to perform the work formerly done by men is helping Carnegie-Illinois Steel Corp. solve the manpower shortage in the Youngstown district. The first group of women employed for factory work by the company at the McDonald Works is processing strip, which consists of cutting large coils of steel to length, stacking and transporting the material by an electric ram truck, and surface-treating it. A. C. Cummings, general superintendent of the Youngstown district, says: "Employment of women on this operation has proven entirely satisfactory. . . If the present male force is further reduced, it will be necessary to draw upon womanpower to an increasing extent." At left above, Mrs. Hazel Husted, a grandmother, feeds strip into a cutoff machine in the hoop shop. At right, another woman employe loads a feeding reel for a cutoff machine

Patrick, president, presented each of them with a Victory Worker's Pin, in patriotic motive with company's name.

Accompanying each pin was his personal letter which said, in part: "Each individual in this plant is contributing to the war effort. All are doing a grand job. All are working at top speed. Men become tired, nerves frayed. This is where the wives and mothers come in. The women at home are just as much a part of this work as they would be running a machine. Their job is to see that the health of their men is maintained. They feed them well; see that they have proper rest and recreation, particularly rest . . ." The pin represents their part in the war effort.

MEETINGS . . . .

American Society of Refrigerating Engineers—Speakers at the thirty-eighth annual meeting, Hotel Commodore, New York, Dec. 1-2 include J. G. Bergdoll Jr., chief engineer, York Ice Machinery Co., York, Pa., on "Recent Engineering Developments in Strato Chambers"; and G. W. Meek, Conservation Division, War Production Board, Washington, "The Present Status of the Refrigerating Industry—An Outsider's Viewpoint."

American Standards Association—J. L. Weiner, deputy director, Office of Civilian Supply, War Production Board, Washington, will speak at the annual meeting, Hotel Astor, New York Dec. 11. A standards report will be presented by R. E. Zimmerman, vice president, United States Steel Corp., and president of the American Standards Association. Technical accomplishments during 1942 will be presented by H. S. Osborne, chairman of the standards council.

Warns Spirit Must Keep Pace with Machines

"Unless man uses his reasoning power to keep pace spiritually with mechanical developments, our civilization can disappear as other civilizations have," James F. Lincoln, president, Lincoln Electric Co., Cleveland, told a group of executives recently at a banquet given in his honor in St. Louis.

"We all recognize technological advance has had a profound effect on life of every individual. The thing we do not recognize is that this same technoligical advance has taken place also in the art of war . . .

"War is still in its infancy. It is a perfectly safe thing to say that if the creative genius of the research workers now in the laboratories of the United States should be directed completely to the arts of war that the tools which they could develop within the next few years would be capable of killing every person in the world in a week. It is because of the fact that this imaginative genius has been used in the arts of peace only that civilization has not already been destroyed in this war. War as a means of settling disputes between nations must be outmoded or this civilization will disappear."

H. K. Ferguson Co., Cleveland and New York, industrial engineer, has been awarded contracts for the design and construction of an ammonia-soda process plant at Bogota, Colombia, S. A. It will be built for an agency of the Colombian government at cost of several million dollars.

Mill Supply Group in Convention Assured of Greater "Recognition"

CHICAGO

A PLEA for more recognition of mill supply distributors in distribution of war materials was made at the tenth annual conference of the Central States Mill Supply Association, in Palmer House, Nov. 16. That such recognition is contemplated in connection with reorganizations within WPB was indicated by various government spokesmen.

Three hundred and fifty members of the association and guests attended. Because of pressure for war goods only manufacturers in the adjacent Chicago district were invited.

Distributors have felt that the government has not recognized the vital function of suppliers in the American industrial system. They pointed out that various regulations and priorities dealing with the distribution of goods have been prepared with the intent of eliminating mill supply houses and warehouses, by encouraging consumers to purchase direct from manufacturers.

In recent months, however, protests to WPB have resulted in the granting of priority ratings which make it possible for inventories to be replaced. The industry is gratified to learn that in the future it will receive still more consideration which will enable it to more nearly fill its normal function.

Much of the success which suppliers have attained in Washington developed from work of a survey committee representing various organizations. Ralph E. Kramer, president, H. Channon Co., Chicago, chairman of the committee, outlined the objectives at the conference.

Distributor vs. Direct Sales

Convincing arguments in the case were given by D. W. Northrup, president, Henry G. Thompson & Son Co., New Haven, Conn., in a cost analysis of distributor versus direct selling. This survey, conducted by the company and dealing with one product which it manufactures, namely, hacksaw blades, sought to answer the question as to what service the distributor renders. Mr. Northrup stated that inquiries developed that 46 per cent of all distributor sales amount to $5 or less, and that these sales amount to only 3.5 per cent of total sales.

In 1939, he said, his company realized a gross profit on its saw blades of 11.75 per cent, effecting distribution through distributors. Had the company been required to sell its product direct to consumers, it would have been necessary to add 16 per cent to the price of the blades, and even then would not have had equivalent contacts with consumers.

For example, direct selling, Mr. Northrup said, would have entailed the employment of more salesmen, opening of several district offices, and otherwise have added to overhead selling costs. Even then, the calls which could be made would not equal those made by distributors in the normal course of their business. He stated that sales made by mill supply houses in 1939 totaled $875,000,000, and were direct selling to add 16 per cent to this, the increase would amount to $140,000,000. He said he did not believe OPA would have permitted such a price rise.

Jobbers Help Wrecked Plant

Mr. Northrup said the distributor's profit on the saws averaged 27.5 per cent, and was regarded as reasonable. As proof that distributors are essential, he told of a department in a war plant that was totally destroyed by an explosion. Within 24 hours, the company was able to obtain all the equipment it needed from distributors and had the department back in operation. It would have been impossible to have done the same thing by direct purchases from manufacturers.

Operation of the new Controlled Materials Plan was explained by Henry P. Nelson, chief of system planning, bureau of priorities, WPB, Washington. He pointed out that distributors probably will find little change in their operations, as compared with practice under present regulations. Priorities will continue to be the controlling factor.

However, Mr. Nelson was emphatic in his belief that distributors' interests will be served more adequately now that the Distributor Branch of WPB has been reorganized into the Distributor Division. In its new status, the division will hold equal rank with other industry divisions, and will have its full complement of advisory committees, which will give distributors a voice they did not previously have.

P. B. Patteson, assistant to the chief, Distributor Division, WPB, Washington, outlined the use of PD-1X. This form, he said, was issued solely to assist distributors to replace stocks, which were sold at ratings too low to command recognition from manufacturers.

Many questions were asked from the floor, and the majority indicated that many distributors find the ratings granted them under PD-1X are too low to obtain deliveries of replacements.

Mr. Patteson stated that the ratings are assigned with the knowledge that the products can be obtained with those priorities. But, he pointed out that it might be impossible to obtain them from the usual source of supply, in which case it will be necessary to contact other manufacturers until one is found that can accept the business. Because the tendency is for all ratings to creep up, the ratings are held to as low a point as possible and still insure the delivery of goods.

Harvey Mansfield, associate price executive, Consumers' Durable Goods Branch, OPA, Washington, discussed the "General Maximum Price Regulation and the Industrial Supply House." By way of introduction, he said OPA is needed because the country is producing at an unheard of rate, wages are at an unheard of total, and less goods are being produced for people to buy with their money. If prices are not controlled, the shortage of goods will create inflation.

Continuing, Mr. Mansfield said that higher taxes will take part of this money, and investments, such as war bonds, will take part. But still a surplus will exist. Inflation, therefore, must be prevented by rationing and special price controls.

Referring to General Maximum Price Regulation, the speaker said it stabilizes prices at the highest of last March and is very broad, covering all goods not covered in separate and specific price orders. Individual adjustments will be made to provide relief where special conditions arise, and these will be handled through amendments to regulation. Under the latter classification are the Machinery Order and Hand Tools Order. Details of these two were explained by Mr. Mansfield.

School To Train Women

Employment of women in a mill supply house was discussed by R. C. Neal, president, R. C. Neal Co., Buffalo, and senior consultant, Distributors Division, WPB. He said mill suppliers are about 25 years behind in education of employes. This fact he discovered when his company undertook to train new women employes. Old employes experienced difficulty in training new girls, because their work had become routine and the "why" was lacking. Consequently, the company organized a school on a voluntary basis, and it is operating with success. This school started with a description of the company's business and explanation of the function of a distributor. Occasionally, a manufacturer's representative participates in the instruction.

Present officers of the association,

with the exception of treasurer, were re-elected. Oscar Iber, president, O. Iber Co., Chicago, continues as president; Walter W. Ethier, vice president and general manager, Western Iron Stores Co., Milwaukee, as vice president; and John Day Jr., John Day Rubber & Supply Co., Omaha, secretary. J. J. Ruddell, vice president, Central Rubber & Supply Co., Indianapolis, was elected treasurer, to replace George Stalker, W. J. Holliday & Co., Indianapolis, who has resigned to go into the nation's armed services.

Trend Toward Better Balance Noted; Demand Still Exceeds Supply

CHICAGO

ALTHOUGH new orders are being received in volume exceeding current shipments, evidence is developing here which indicates possibility of an easier market situation in the near future. Steelmakers, however, find that the supply of ingot is inadequate to utilize finishing capacity to the maximum, and all could use additional ingot if they were available.

Chicago district operations for the year to date have averaged 103 per cent of theoretical capacity. Average for the first half was 103.6 per cent, and since July 1, 102.1 per cent.

Despite this high rate of production, demand for steel consistently has exceeded the ability of the mills to produce and ship it.

However, steelmakers believe they detect a trend toward better distribution of steel, which may grow to more or less complete easing within a few weeks. This belief is given support by the fact demand for steel for civilian requirements has now shrunk to almost nothing, that Lend-Lease requirements have recently been greatly pared down, and that manufacturers of some war items are less pressing in their demands for deliveries.

Cancellations Follow Split Ratings

In the first place, PRP resulted in sweeping reclassifications of steel requirements based on end use, and this brought about the splitting of ratings, some remaining high or being raised, and others being lowered to points where they precluded rolling and delivery under existing conditions. War goods manufacturers hampered by the lower ratings protested bitterly and sought improved ratings. Some were successful, others were not, and the latter group made extensive cancellations.

Recently, some manufacturers have requested that shipments be deferred, indicating that inventories exceed current production schedules. These excess inventories result either from the fact that steel was ordered in quantities larger than needed, or that the government ordered production curtailed.

It is pointed out that the steel industry has passed through three distinct phases. First was the defense period, in which the government and industry organized for production of war goods. Quantities of materials needed were vague and more often than not overshot the mark.

Second phase was the war period, which started with the attack on Pearl Harbor. In this span, production schedules and quantities of materials were refined to attain the required goal.

Surplus Stocks Being Located

Finally, came the settling down or good management period, now going on, in which requirements and production are being balanced more precisely. The problem is qualitative rather than quantitative, and certain excesses of stocks are being located and being redistributed.

Among signs that a satisfactory balance is near at hand is the situation in sheets and tin plate. Recently revised quotas placed steelmakers back in the sheet field, and competition once more has sprung up. Demand for heavy gage sheets continues strong and no evidence of weakening can be seen. Light gage sheets, on the other hand, are easy and the mills are in a position to take properly rated business in this product.

It now appears that restrictions on the use of tin plate were too severe. There is good reason to believe that even as early as December, the production rate may be stepped up from the 40 per cent or lower at present to approximately 60 per cent. And with it would come an easing in the restrictions on use of the material.

With the decline in building construction, extremely sharp in the last two months, structural mill schedules have been lightened, and mill operators feel they will be able to take on additional tonnage early in the new year. A similar situation obtains with concrete steel bars.

Slight easing is noted in pipe and wire, but bars of all grades continue tight.

It should be pointed out, however, that the present trend could reverse itself almost overnight. The military situation might become such that larger supplies are needed quickly, or that a certain type of equipment must be produced quickly and in larger quantities. Further, it is not known what new production program might be brought out by WPB on short notice. Not to be overlooked also is the fact that the enemy might turn up with some new weapon which would require immediate counter defense measures. But barring these unforseen possibilities, it would seem that our steel supply situation is rapidly being smoothed out to a more satisfactory and workable basis.

Steel Shipped for Eastbound Leg of "Big Inch" Pipeline

First shipment of seamless steel pipe for the eastward extension of the war emergency pipeline has been moved from an Ohio mill to strategic points along the eastbound right-of-way.

Deliveries will be maintained at the same rate achieved throughout construction of the Texas-Illinois leg of the line to permit continuance of the present record construction pace, according to Deputy Petroleum Coordinator Ralph K. Davies, who said:

"A contract covering the first 360 miles of pipe required for the completion of the Texas-East Coast line was let by War Emergency Pipelines Inc., to the National Tube Co. on Oct. 30—within 48 hours of the allocation of steel for the extension.

"The prompt conclusion of this contract permitted the pipe supplier to maintain uninterrupted fabrication of the 24-inch tubing at the same mill and with the same facilities. Pipe for the remainder of the 857-mile extension will be ordered at a later date."

The 215,000 tons of steel necessary for the completion of the war emergency pipeline carry an AA-3 priority rating, sufficiently high, it is believed, to insure continuous delivery of pipe and equipment when construction operations get underway before the end of this month.

Meantime, construction of the Texas-Illinois leg is still hitting a pace of about five and a half miles a day, with the result that, barring adverse weather difficulties, this section of the line should be completed early in December.

3500 Tons of Reclaimed Steel Used In Building Ohio River Navy Yard

APPROXIMATELY 3500 tons of steel, enough to build two modern Navy destroyers, were conserved by the American Bridge Co., U. S. Steel subsidiary, in developing the new Navy yard on the Ohio river which is now building the Navy's latest type landing ship for tanks. The company reports:

"This tonnage of steel is represented by material obtained through dismantling inoperative U. S. Steel properties in other localities, which material, after thorough inspection and alteration to fit the requirements of the newly designed structures at the yard, was re-erected to provide modern fabricating facilities. In a similar manner, many thousand square feet of building enclosure, such as roofing, siding and sash, were reclaimed and utilized in the yard's development.

"Built and operated for the Navy by the American Bridge Co., assembly line methods are speeding the building of these tank landing craft. Fabricating facilities of the new yard, which include a building having 5½ acres under roof, are supplemented by shops at the adjoining plant of American Bridge.

"These combined facilities provide a self-contained, fully integrated unit which is producing completely outfitted, ready-for-service craft of this special type. Mill shapes and plates are fabricated and pre-assembled in sections in the various shops, and flow on to the ship berths. A complete modern outfitting dock is provided at the terminus of the launching ways.

"All of the shipbuilding berths are serviced by overhead traveling cranes which facilitate the operations considerably. This is one of the few yards where this type of equipment is in use.

"The tremendous job of building and equipping this modern 64-acre shipbuilding plant was achieved in a little over four months, with actual shipbuilding operations beginning three weeks ahead of schedule.

"It is estimated that capacity production of these ships will expand present plant personnel by 100 per cent."

Use High-Voltage, Conserve 500,000 Pounds of Metal

More than 500,000 pounds of copper, steel, lead and other materials was saved in the processing of a single project application by WPB.

The case is of more than usual interest, involving as it does $175,000 worth of wire and lighting equipment for Australian airports in the area of operations under Gen. Douglas MacArthur. The application was made by the Lend-Lease administration, and was supported by a cabled endorsement from General MacArthur.

The equipment requested required the use of a low-voltage, or multiple lighting system, which would have absorbed 150,000 pounds of copper, 226,000 pounds of steel, and 380,000 pounds of lead. After examination of the application, the WPB Lighting Fixtures Section suggested use of the high-voltage system recommended by the Civil Aeronautics Administration for airports in this country.

This resulted in the following savings: 140,310 pounds of copper, 82,000 pounds of steel, and 280,000 pounds of lead.

The high-voltage system, officials explained, will in no way affect the efficiency of the lighting.

Moreover, the change made by the branch permits the use of equipment which is standard for street and other common lighting systems in this country, thus expediting delivery. The changes were approved by representatives of the Australian government, the CAA, and the Lend-Lease administration.

A high rating was assigned to the project, and equipment was soon on its way "down under."

Makers of Forged Cylinders Appeal for Prompt Action

Heavy increase in the use of compressed industrial gases, notably oxy-acetylene, for welding and flame-cutting, is taxing capacity of the few producers of forged steel cylinders. To relieve a threatened bottleneck in supply of high-pressure containers, efforts are directed toward a more rapid return of empties for recharging.

Increase of allowed pressure in standard cylinder-containers for true gases, which include oxygen, from 2000 pounds per square inch to 2200 pounds, has in effect accounted for a 10 per cent increase in old cylinder capacity. Tremendous demand, however, not only for industrial gases for immediate consumption, but also for fire extinguishing equipment for installations on planes, ships and tanks, life rafts and other inflated life-saving apparatus has broken all records. Much of new war demand requiring use of carbon dioxide in steel cylinders for fire-fighting on combat equipment precludes early return of containers, installations being more or less permanent.

Transportation regulations and limitations are a governing factor in container returns. ODT orders prohibit less than carlot shipments and cylinders are frequently held 36 hours or until shippers have accumulated 10 tons of merchandise for shipment in less than car lots. Trucks also are becoming more difficult to obtain due to gasoline, tire and operator limits. Delays are centered largely in returns. Full cylinder deliveries, when containers are available, are reasonably prompt, for while producers of industrial gases are operating at capacity on some types no serious shortage of compressed gases is in sight. Only in the supply of containers does a bottleneck loom. Welding departments, including shipyards, are operating at times close to the safety margin on gas supplies and instances of suspensions for a few hours have been reported.

Expansions in capacity for manufacture of steel cylinders from both billets and plates, while substantial, have not been sufficient to take up the tremendous load resulting from increased demand; extended deliveries necessarily follow. Bulk of cylinders are fabricated by three large producers and they have contracts for other war requirements including bombs in some instances. Additional facilities for production of cylinders in other directions are under consideration; some supplemental capacity may be attained by spinning ends in tubing. Not only are limited steel supplies and forging equipment a factor in cylinder production, but heat-treating and testing each container contributes a time-consuming factor, also fittings, valves and regulators.

Steel-Saving Suggestion by Electrical Worker Wins Award

Approximately 22 tons of steel will be saved at a New Jersey plant of the General Electric Co. this year, because a veteran worker, Axel Johnson, suggested an improvement in the production of electric equipment for cargo ships.

Suggestion brought Mr. Johnson the first Award of Individual Production Merit granted an employe of the company by the War Production Board. He also received a check for $250.

Plan called for a pattern change to reduce weight of brake wheels and enable a greater number to be obtained from the same amount of molten metal. Several pounds of steel are saved in each casting. Man-hours are reduced 10 per cent because the lesser weight requires less machining of each brake wheel.

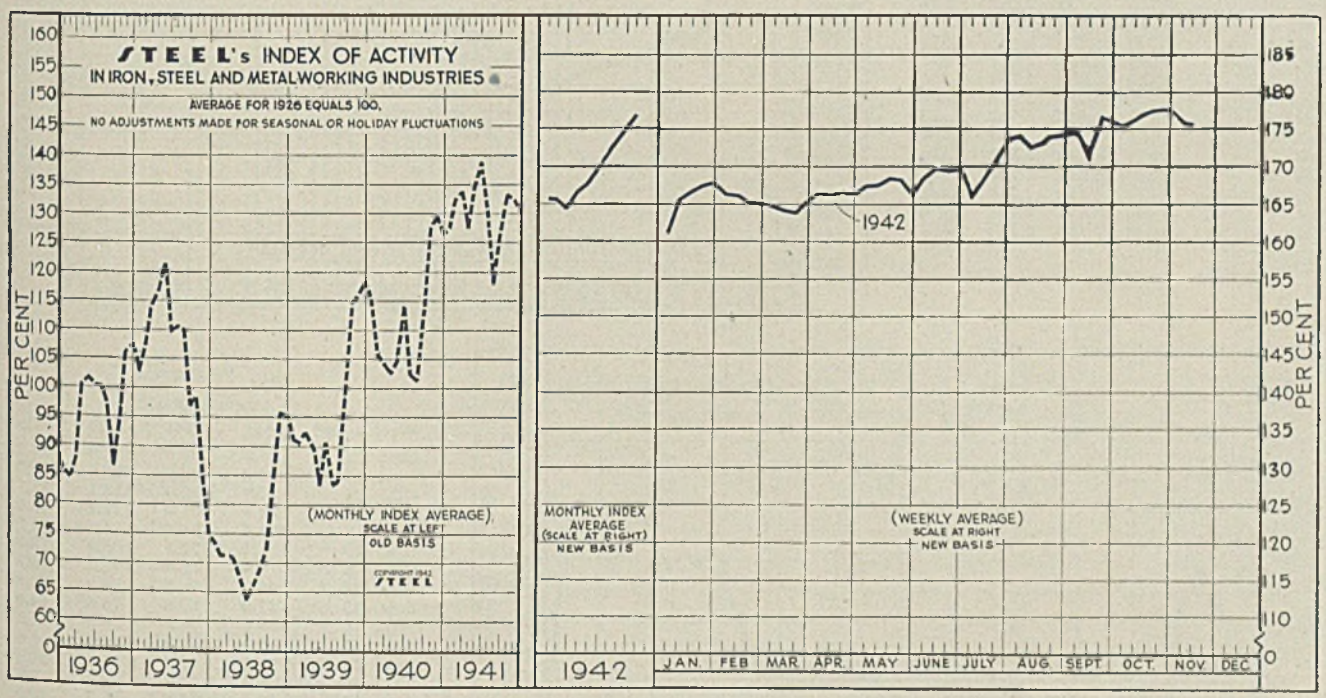
Increased War Effort Likely To Develop

INDUSTRIAL activity is expected to be stimulated by our move active participation in the combat zones. Attitude of most persons will probably tend to a greater willingness to make additional sacrifices, while war workers will be more conscious of the important part they are playing in keeping the men supplied with fighting equipment.

Seasonal decline in revenue freight carloadings is the chief factor in forcing STEEL'S index of activity to lower levels during past two weeks. The index eased 0.2 point in the week ended Nov. 14 to 175.4. This compares with the all time peak of 177.8 recorded by the index during the week ended October 31 last.

Completion of open hearth furnace repairs at some points resulted in a half point rise in the national steel rate to 99 per cent during the week ended Nov. 14. Steel scrap supply situation has improved measurably with some steel producers able to add to inventories for the first time this year. WPB recently reported that no steel plants are down due to lack of scrap, and added that if the situation continues as at present there will be no scrap shortage this winter. Incoming orders on certain steel products continue to exceed output despite record production and high priority ratings required.

Electric power output climbed to a new high of 3,775,878,000 kilowatts in the week ended Nov. 14. This represents a gain of 12.8 per cent over that recorded in the like 1941 period. Revenue freight traffic declined seasonally to an estimated total of 800,000 during the latest period. This compares with the peak level attained this year of 909,957 cars.



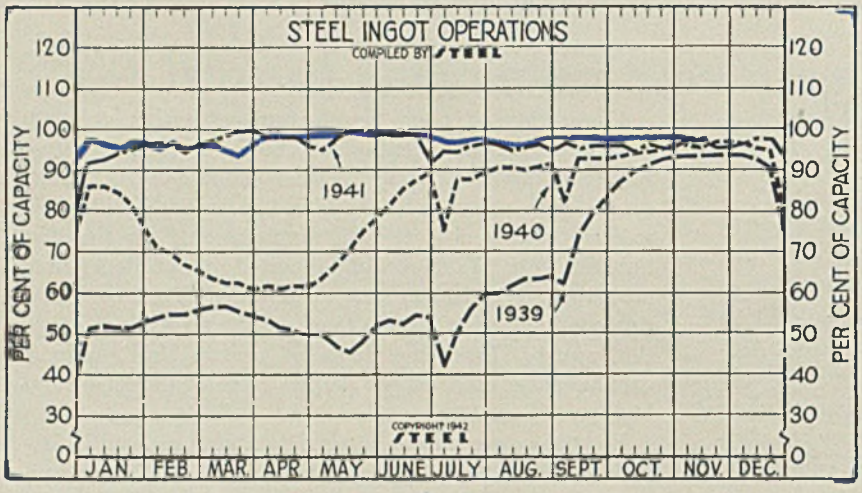
STEEL's index of activity declined 0.2 point to 175.4 in the week ending Nov. 14:

Week Ended	1942	1941
Sept. 12	171.2	131.3
Sept. 19	176.8	130.6
Sept. 26	176.0	132.0
Oct. 3	175.5	132.7
Oct. 10	176.5	132.3
Oct. 17	176.9	133.4
Oct. 24	177.7	133.5
Oct. 31	177.8	133.8
Nov. 7	175.6	134.4
Nov. 14	175.4†	133.8

†Preliminary.

Mo. Data	1942	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931
Jan.	165.7	127.3	114.7	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1
Feb.	165.6	132.3	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5
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
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
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
June	169.4	138.7	114.1	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1
July	171.0	128.7	102.4	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3
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.	174.8	126.4	113.5	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3
Oct.	176.9	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	93.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3

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.



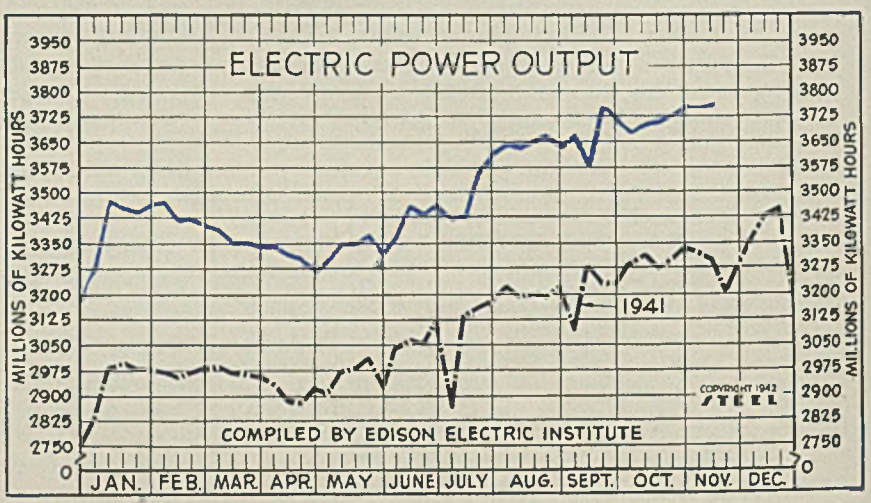
Steel Ingot Operations
(Per Cent)

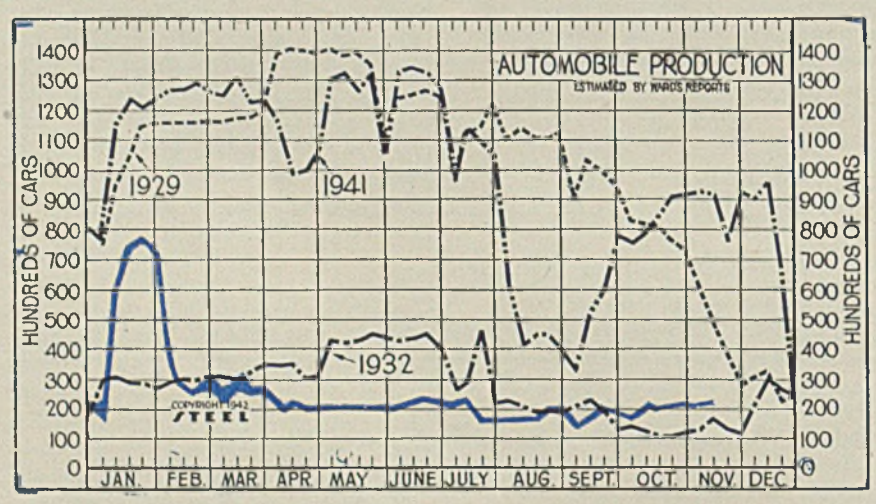
Week ended	1942	1941	1940	1939
Nov. 14	99.0	97.0	96.0	93.5
Nov. 7	98.5	97.5	96.5	93.0
Oct. 31	99.0	95.5	96.5	93.0
Oct. 24	99.0	95.5	95.5	92.0
Oct. 17	99.0	96.5	95.0	91.0
Oct. 10	98.5	94.5	94.5	89.5
Oct. 3	98.0	96.0	93.5	87.5
Sept. 26	98.0	96.0	93.0	84.0
Sept. 19	98.0	96.0	93.0	79.5
Sept. 12	98.0	96.5	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

Electric Power Output
(Million KWH)

Week ended	1942	1941	1940	1939
Nov. 14	3,776	3,305	2,890	2,587
Nov. 7	3,762	3,326	2,858	2,589
Oct. 31	3,775	3,339	2,882	2,609
Oct. 24	3,753	3,299	2,867	2,622
Oct. 17	3,717	3,273	2,838	2,576
Oct. 10	3,702	3,315	2,817	2,583
Oct. 3	3,683	3,290	2,792	2,554
Sept. 26	3,720	3,233	2,816	2,559
Sept. 19	3,757	3,232	2,769	2,538
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	2,746	2,454
Aug. 8	3,649	3,196	2,743	2,414

†Preliminary.





Auto Production
(1000 Units)

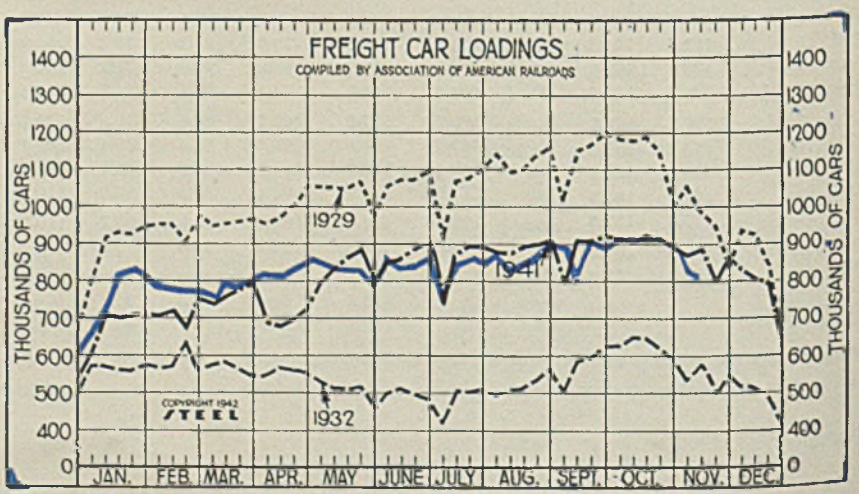
Week ended	1942	1941	1940	1939
Nov. 14	20.2	93.0	121.9	86.7
Nov. 7	20.2	93.6	120.9	86.2
Oct. 31	20.9	92.9	118.1	82.7
Oct. 24	20.8	91.9	117.1	78.2
Oct. 17	20.2	85.6	114.7	70.1
Oct. 10	20.3	79.1	108.0	75.9
Oct. 3	19.9	76.8	105.2	76.1
Sept. 26	20.9	78.5	96.0	62.8
Sept. 19	21.0	60.6	78.8	54.0
Sept. 12	19.6	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	24.9

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
Nov. 14	800†	884	745	771
Nov. 7	829	874	778	786
Oct. 31	891	895	795	806
Oct. 24	903	914	838	834
Oct. 17	901	923	814	861
Oct. 10	910	904	812	845
Oct. 3	908	918	806	835
Sept. 26	898	920	822	835
Sept. 19	903	908	813	815
Sept. 12	815	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

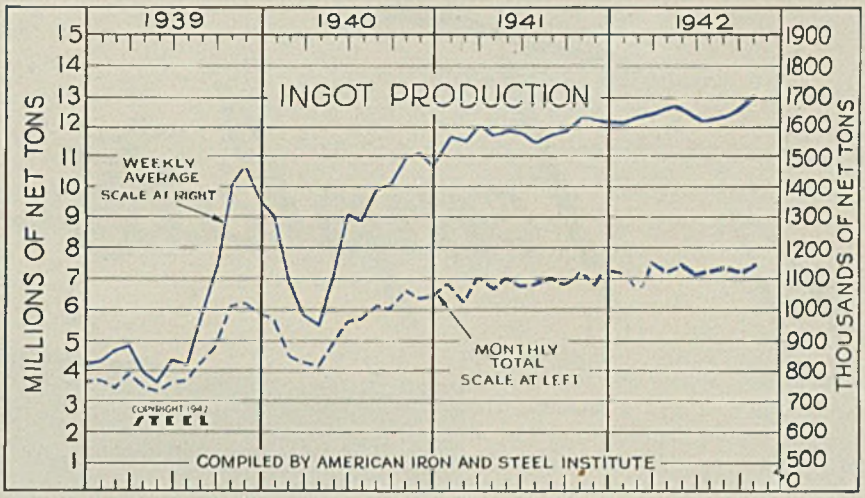
†Preliminary.

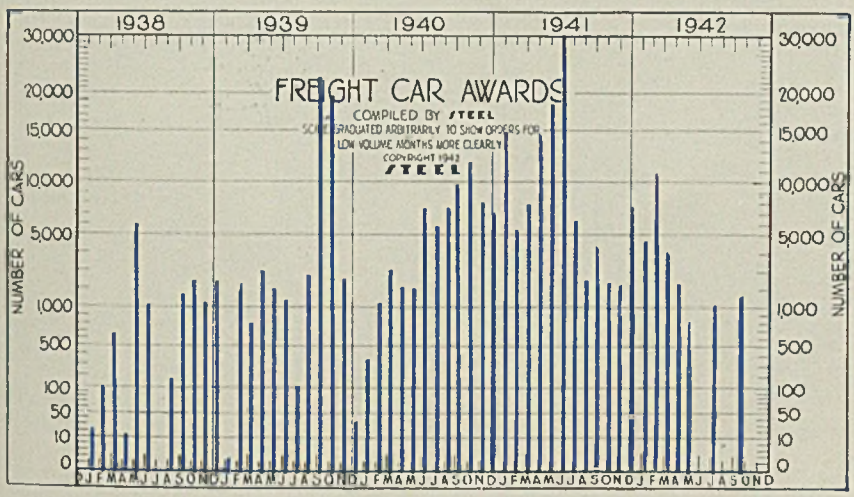


Steel Ingot Production

(Unit 100 Net Tons)

	Monthly Total		Weekly Average	
	1942	1941	1942	1941
Jan.	7,124.9	6,922.4	1,608.3	1,562.6
Feb.	6,521.1	6,230.4	1,630.3	1,557.6
Mar.	7,392.9	7,124.0	1,668.8	1,608.1
April	7,122.3	6,754.2	1,660.2	1,574.4
May	7,386.9	7,044.6	1,667.5	1,590.2
June	7,022.2	6,792.8	1,636.9	1,583.4
July	7,148.8	6,812.2	1,617.4	1,541.2
Aug.	7,233.5	6,997.5	1,632.8	1,579.6
Sept.	7,067.1	6,811.8	1,651.2	1,591.5
Oct.	7,584.9	7,236.1	1,712.2	1,633.4
Nov.		6,960.9		1,622.6
Dec.		7,150.3		1,617.7
Total		82,856.9		1,588.7





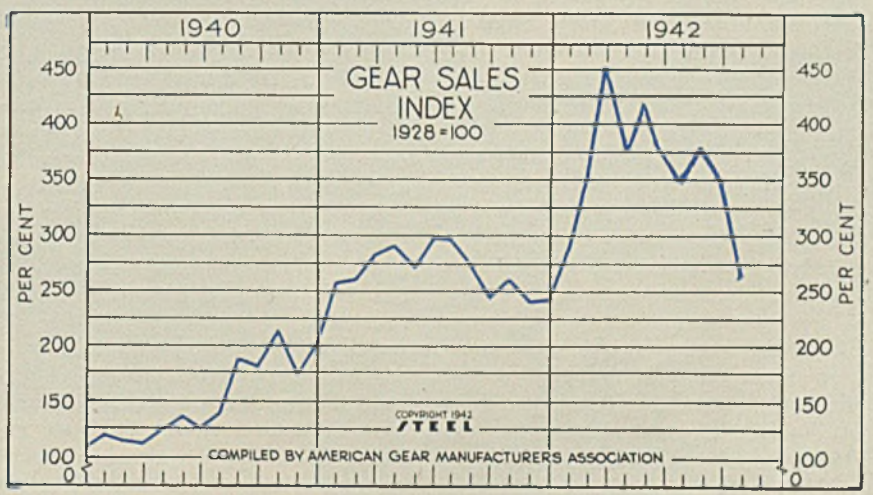
Freight Car Awards

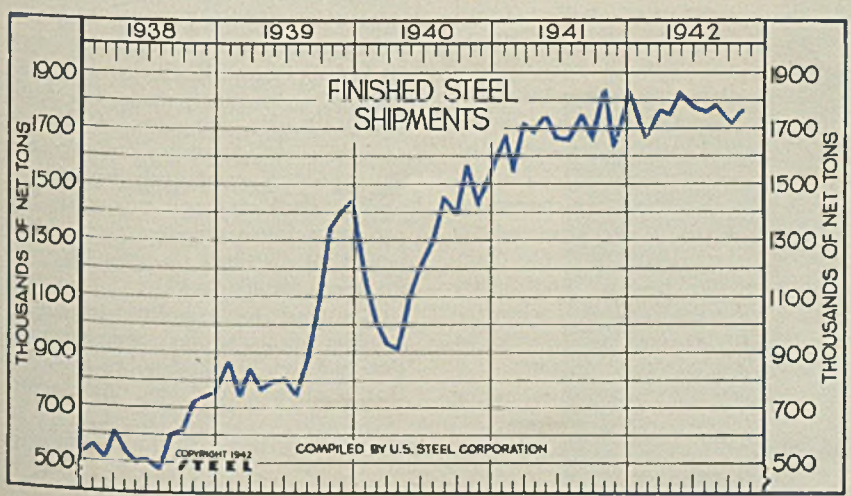
	1942	1941	1940	1939
Jan.	4,253	15,169	360	3
Feb.	11,725	5,508	1,147	2,259
March	4,080	8,074	3,104	800
April	2,125	14,645	2,077	3,095
May	822	18,630	2,010	2,051
June	0	32,749	7,475	1,324
July	1,025	6,459	5,846	110
Aug.	0	2,668	7,525	2,814
Sept.	1,863	4,470	9,735	23,060
Oct.	0	2,499	12,195	19,634
10 mos.	25,893	110,761	51,465	55,080
Nov.	.	2,222	8,234	2,650
Dec.	.	8,406	7,181	35
Total		121,499	66,889	57,775

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.	351	243	183	126.0	80.5
Oct.	263	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





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.	1703.6	1664.2	1392.8	1086.7	635.6
Oct.	1787.5	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.†		20,458.9	15,013.7	11707.3	7315.5

†After year-end adjustments.

A Template-Making

AMERICAN industry always seems to have a flock of solutions flying around trying to find a problem. That is why it can be depended upon to adjust itself to any circumstances quickly. And war production has brought plenty of them.

Perhaps one of the most unique examples is the recently perfected method of template, reproduction by X-radiation in which photographic methods have been skillfully adapted to break a seeming bottleneck in aircraft production. The result of this process has been to facilitate production greatly by the increased speed, accuracy, quantity, economy and lowered man-hours made possible—retaining such fidelity to size in templet duplication that no checking is required.

This development started in the Photographic Section of the General Motors Corp., headed by Philip Filmer. He has been with that corporation since 1920, now numbers 247 people on his staff, has contributed much original thinking to photographic research. He has long been interested in the problem of metal body drafting reproduction, but no specific problem had presented itself until the Fisher Body Division experienced difficulty and delay in making all components match on its Oldsmobile embossed door trim in 1940.

Early in 1941, Mr. Filmer's department was asked to suggest some means of providing extremely accurate reproductions of metal drawings on various components covering the 1942 door trim program in which Oldsmobile, Pontiac, Buick and Chevrolet were involved. This had to do with templates used to create cutting dies to cut tufting felt, the foundation panel stamping, locating fixtures and backing for embossing dies. There were, in all, six components to be sandwiched into this door trim, all coming from six varied sources. They all had to fit precisely. The problem was little different from that encountered on a grander scale by varied aircraft manufacturers when they stepped up to war production.

Mr. Filmer approached this problem on the basis of making the original drawing upon a surface capable of being made to glow with light. This glow then made possible photographic reproductions on another sheet of properly sensitized metal by placing it in contact with the first. A composite master drawing on metal was used, providing a distinctive contour line for each component element, thus assuring complete fidelity of dimensional control. All difficulties in the sandwich assembly of this door trim were eliminated in this manner.

The problem of sensitizing large sheets of metal had been bothersome in previous experiments, so the technical services of Eastman Kodak Co. were enlisted. This resulted in the development of the Eastman matte transfer paper which completed the solution of the problem, now so perfectly applicable to aircraft template making.

No sooner had this process been perfected than the aircraft industry swirled into mass production, and template requirements soared skyward. The laborious, inaccurate, time-consuming, hands-and-knees method of scrambling around on a loft board to create drafting patterns for bombers and fighter planes in the volume specified when the United States became the arsenal of democracy could not be tolerated.

The lofting system of template making was an 18th century hangover from the shipbuilding industry, starting back with the construction of the Yankee clippers. It had been continued because, until the war, no real mass production of aircraft had been necessary. Under the new demands of extreme accuracy, this older practice could easily have bottlenecked much vital war production had not other faster processes such as this new GMC-Eastman photographic process been adapted quickly.

The need for templates in aircraft manufacture is swelled almost beyond the limits of imagination, compared to that of automotive design. Size, accur-

Shortcuts

. . . . employs X-ray activated material which prints from negative to positive plates by phosphorescence. Direct contact printing retains precise dimensions of original to speed production of accurate templates

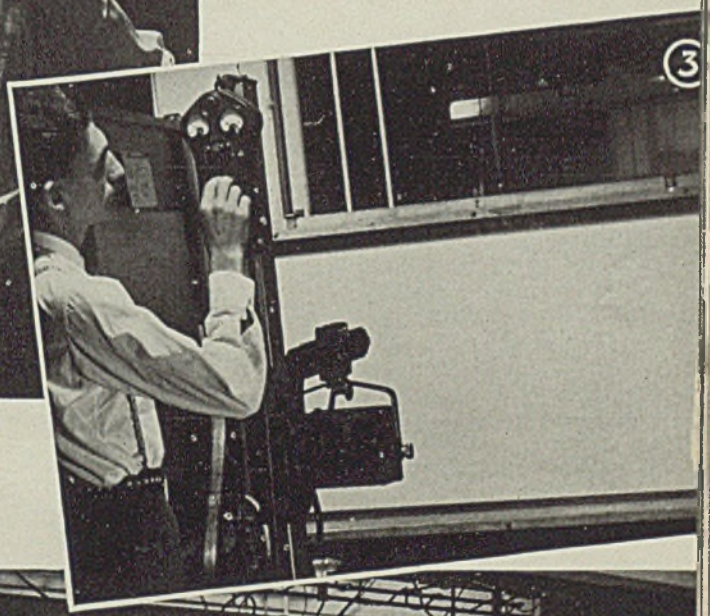
By GERALD E. STEDMAN

Fig. 1—Original drawing for the template is made directly on a phosphorescent lacquered sheet of metal. Additions and corrections can be made at any time

Fig. 2—Applying matte transfer paper to metal panel in laminator prior to printing operation

Fig. 3—X-ray machine being used to activate phosphorescent lacquer coating on the original drawing

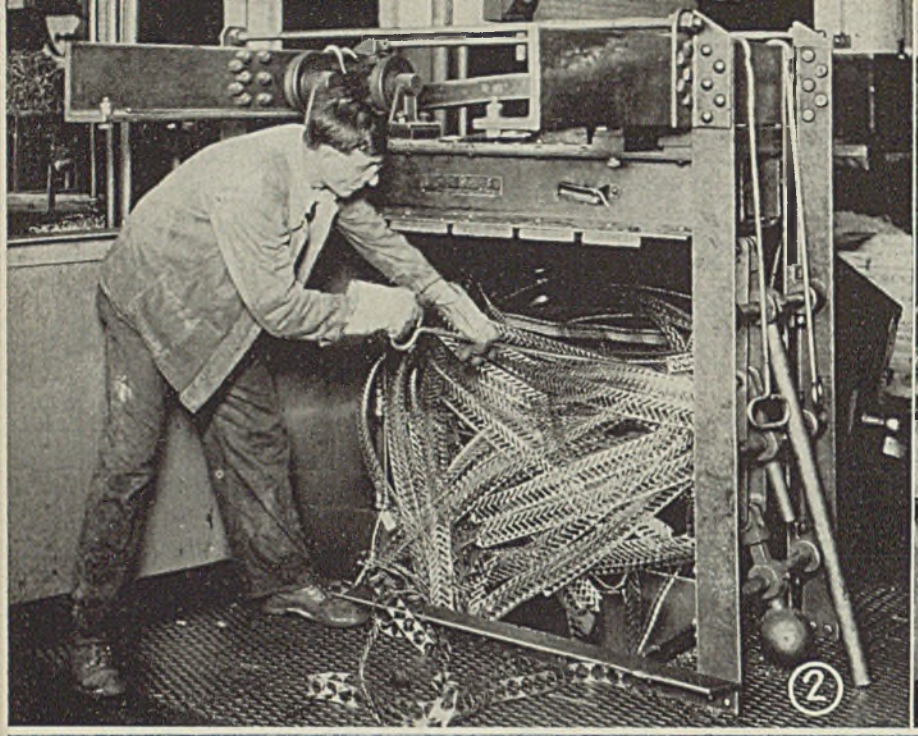
Fig. 4—Vacuum printing frame in which original and duplicate panels are held in intimate contact for the printing exposure

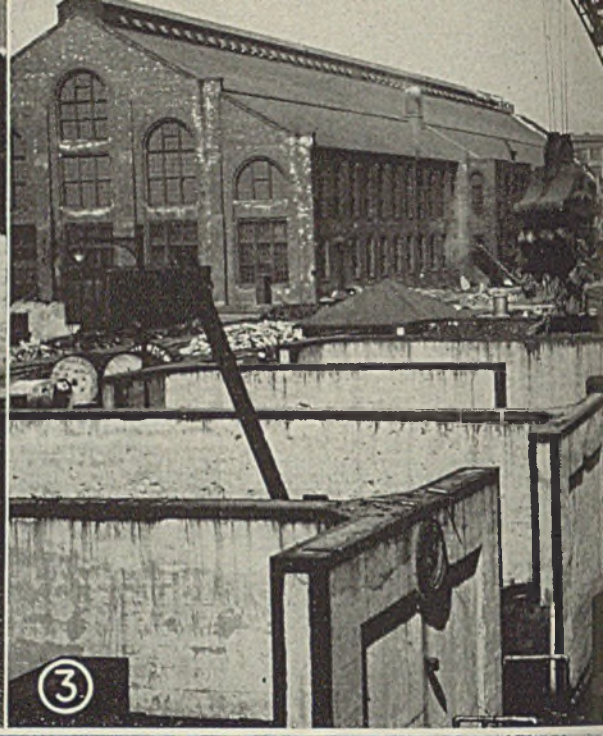


acy, engineering detail take on definitions not known before. There are 30,000 parts in a bomber, for example, which are built into 650 units and these into some 32 subassemblies; all needing detailed drafting and template reproduction and duplication in myriad forms, shapes and sizes. Prefabricated often in widely scattered shops, these subassemblies must fit to tolerances that cannot stray from 0.001-inch in the final assembly.

The principle of interchangeability of parts is, of course, more vital under battle conditions, for the army that can

(*Please turn to Page* 110)

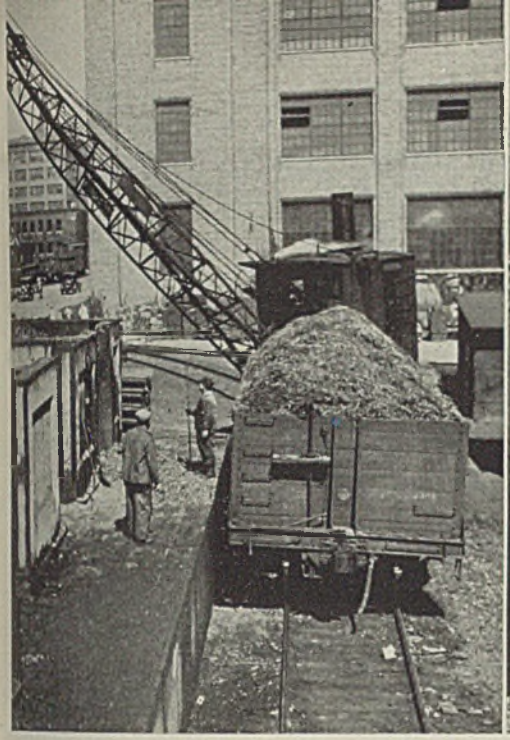




To get in urgently needed scrap, D. W. Gee, a leader in WPB's industrial salvage program, says the first thing is...

GET A SCRAP-

BY HERBERT E. FLEMING



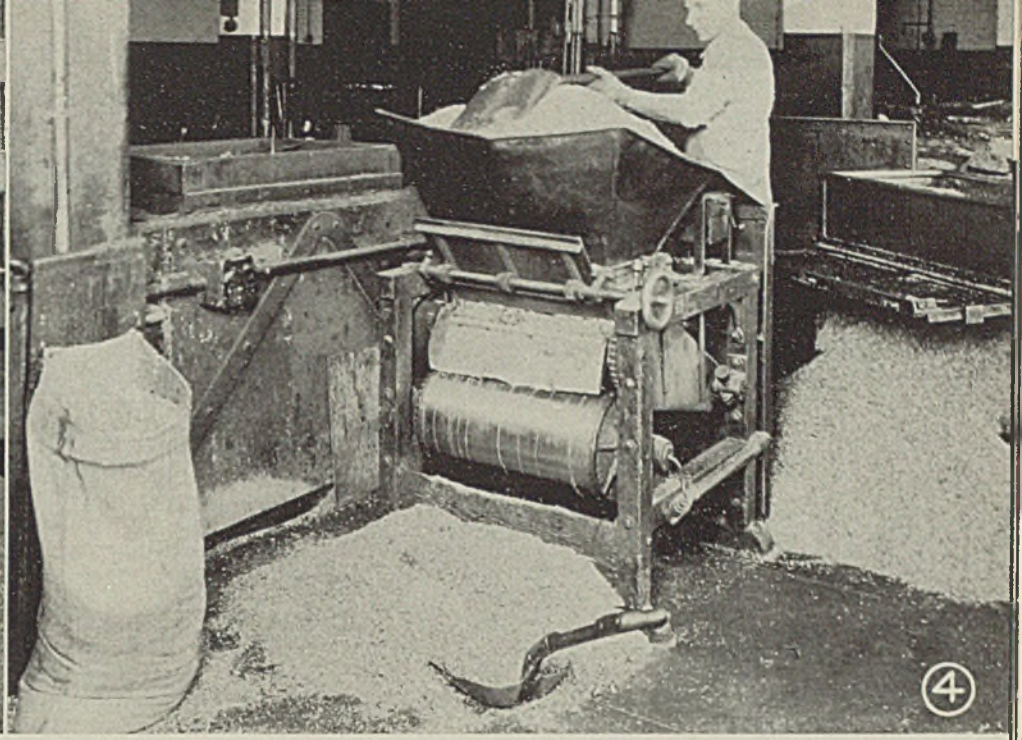


Fig. 1—"Dan" W. Gee, WPB industrial salvage leader, points to tacks representing communities in 14 states where he has over 14,000 "salvage directors" at work on reclamation

Fig. 2—Skeleton brass scrap remaining after punch press operations is baled in the machine shown here

Fig. 3—Bulky, curly steel turnings are loaded from outdoor collection bins of concrete faced with steel to protect corners. Both grab buckets and electric magnets are utilized in the handling operations. Railroad crane is part of effective interplant railroad system at Western Electric's Hawthorne works, near Chicago

Fig. 4—Brass turnings at Western Electric's Hawthorne works are put through this magnetic separator to remove any steel or iron that may be present

SALVAGE MANAGER

in every metal producing and metalworking plant and give him the authority to act

IN REMAINING days of 1942 we must salvage 17,000,000 tons of scrap to meet the goal set by the War Production Board to assure enough for steel for war production.

According to present estimates, 26 of the new furnaces for converting ore into pig iron will not be completed until some time in 1943. Steel manufacturers point to a planned production of 90,000,000 tons of steel for 1942 and say they need at least 30,000,000 tons of iron and steel scrap.

Mills will be 4,500,000 tons short of needed scrap unless many more plants join in herculean efforts to get it in. Such efforts are needed partly because scrap going into steel for shells, bombs, guns, tanks, planes and ships moving to battle fronts all over the world will not come back—some not for the duration, some never.

There is no exaggeration in such headlines as, "Lack of Scrap Slows Output of Steel Mills".

In this situation the experiences, philosophy and practical suggestions of D. W. Gee are illuminating. For almost a year he has been a leader in the Industrial Salvage Campaign of the Bureau of Industrial Conservation, Division of Industry Operations, WPB. For 20 years before that he was chief of the Reclaimed Materials Division of the Western Electric Co.

During his two decades in charge of recovering usable materials for Western Electric he turned back to the company $110,000,000 from reclaimed materials. While the major part of this was from salvaging cables from telephone companies, much was ferrous material from the Hawthorne works of Western Electric in Cicero, near Chicago.

This salvage expert retired from Western Electric last October, but "before he had a chance to hide" he was drawn to Washington, where he served first for three months as head industrial specialist on materials conservation. Then Washington sent him back to Chicago and until the middle of June he was regional manager of the Industrial Salvage Section of the WPB Chicago region, comprising Illinois, Wisconsin and Upper Michigan, Indiana, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas, Kentucky, Tennessee, Alabama. WPB decentralized recently and cut his region to Illinois, Indiana, Wisconsin, Iowa; another Chicago regional manager of the Industrial Salvage Section is to be appointed, and Mr. Gee has been given the enlarged duties of chief technical adviser of the Industrial Salvage Section of the Bureau of Industrial Conservation.

During his intensive work as Chicago regional manager, Mr. Gee and assist-

ants secured, between April 1 and June 15, in the 14 states, the appointment of a total of 14,076 "salvage directors," or salvage managers, in as many plants. From them he received on a simple form some 99,050 semimonthly reports. These showed usable waste materials salvaged in pounds as follows: Ferrous, 617,583,155; nonferrous, 53,381,630; rubber, 3,408,139, all other—rags, rope, paper, etc.—70,085,679; total, 744,458,603.

In securing the appointment of these salvage directors in about half of 29,000 machine shops and metalworking factories having ten or more employes, the appeals for action were made on a purely voluntary basis. No mandatory leverages such as preference ratings of the Bureau of Priorities or the legal powers of the Office of Price Administration were employed. But in every state he received the co-operation of business associations and individual manufacturers.

However, in the four states remaining in the Chicago WPB region, 4300 *of the* 10,000 *potential metal-scrap-salvaging companies have yet to name salvage directors for their plants.* No doubt this same 43 per cent or higher holds throughout the entire country.

Any metalworking company, small or large, which has not yet appointed its salvage director should do so—NOW. Getting a salvage manager going and backing him up will be doing a real job in helping win the war. Let's get started!

While co-operation is voluntary, in the few cases where manufacturers in war production work at first refused to appoint salvage directors, the regional WPB salvage office has mentioned the matter to the Ordnance Department or the OPA. Those units then sent inspectors to call on such concerns to help them see the desirability of co-operating in the recovery of waste materials. The desirability of doing so got solemn emphasis from the words of Donald M. Nelson, the realistic chairman of the WPB, when he said in a recent address, that "within a very short time waste of material is going to be treason."

Committees Lead Drive

To get a salvage director appointed for all departments in every plant, the first step was to have an association for a state or an industrial district call a general meeting at which the program was explained and an executive committee made up of presidents, vice presidents and works managers of leading companies named. Such committees are functioning in 100 communities in the 14 states.

At these meetings Mr. Gee made concise talks in which he brought out such points as those in the first paragraph of this article, outlined his philosophy that a given amount of elementary metal is an estate which it is a duty to conserve, pointed out that salvaging materials not only helps to win the war but also saves money, and gave how-to-do-it suggestions out of his Western Electric experience. Conspicuous was the point that the salvage director for each plant must be given not only the responsibility *but also the authority to locate, collect and segregate waste materials and to sell them* so that they will move back into war production.

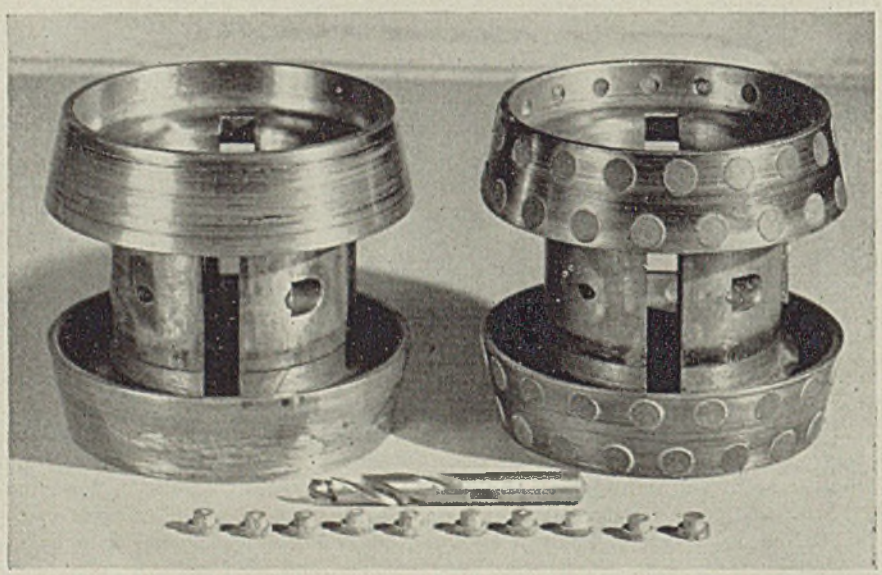
A "Keep Scrapping" poster issued by WPB, saying "America needs more rubber, metals, rags, paper, burlap," carries a star before "metals" and a footnote with this advice: "Separate the different metals." Insistence on segregation of different kinds of scrap, and, to that end, clean-cut classification is emphasized by Mr. Gee. For Western Electric he had worked up and used for years a decimal classification comprising 14 main groups and 254 classes in all. The 14 are:

1—Aluminum
2—Brass
3—Bronze
4—Copper
5—Iron and steel
6—Lead and lead alloys
7—Misc. nonmetallic
8—Misc. metallic
9—Nickel and nickel alloys
10—Waste paper
11—Rubber
12—Textile scrap
13—Tin and tin alloys
14—Zinc and zinc alloys.

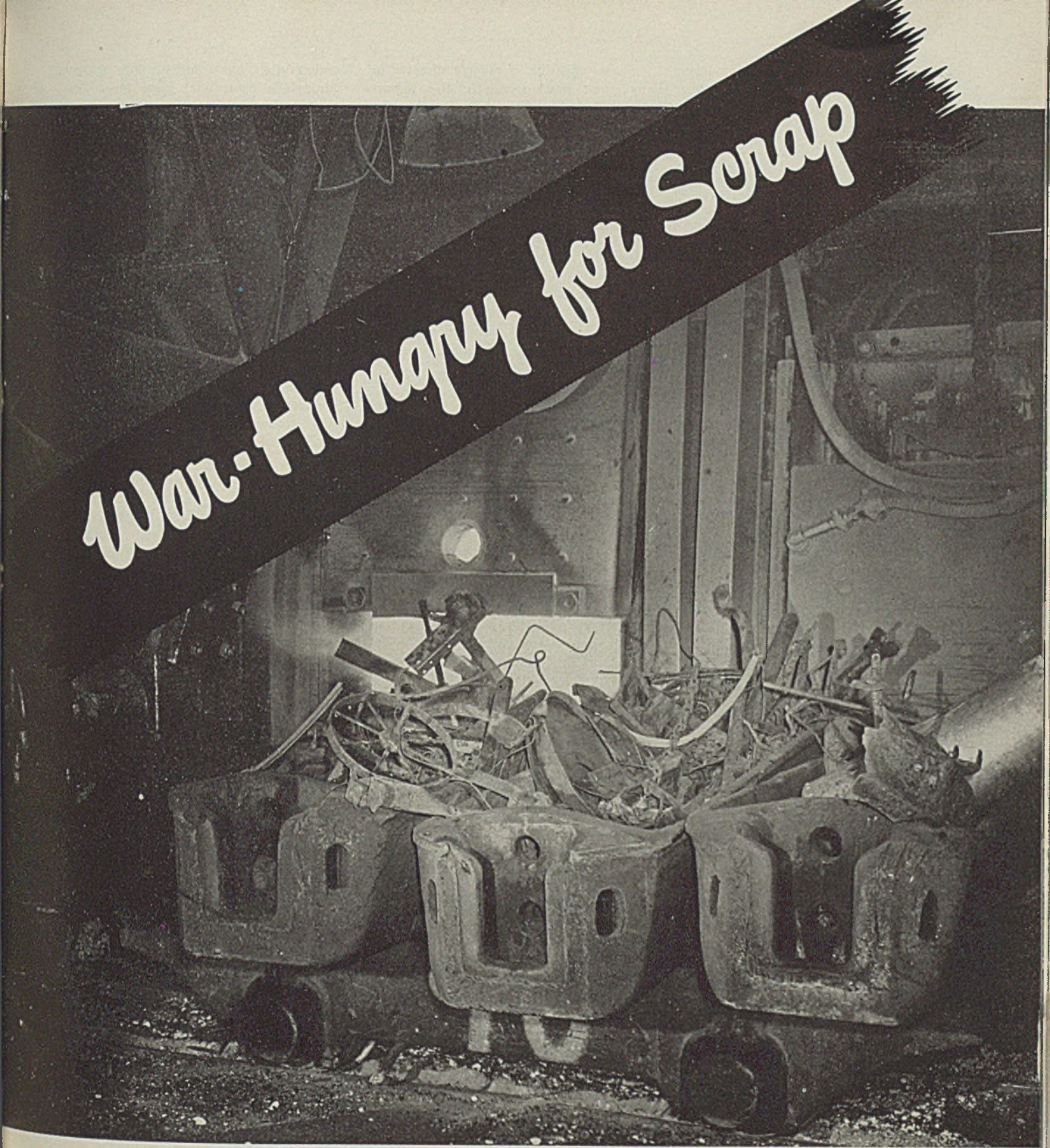
The subclasses for iron and steel in this classification system number 31. They are as follows:

5.01—Stamping steel in bales
5.02—Silicon steel
5.03—Iron or steel pipe and steel tubing
5.04—Long steel
5.05—Short steel
5.06—Painted and misc. steel
5.07—Light cast iron
5.08—Heavy cast iron
5.09—Steel turnings
5.10—Black sheet steel
5.11—Galvanized iron
5.12—Iron wire
5.13—Cast iron borings
5.14—Cast iron borings with brass
5.15—Misc. scrap and fabricated steel
5.16—Steel drums
5.17—Old steel files
5.18—Iron with brass pins
5.19—Machinery (scrap machinery included in Class 5.15)
5.20—Tungsten steel
5.21—Cobalt steel
5.22—Cobalt steel turnings
5.23—Steel shearings and stampings, loose
5.24—Cobalt steel grindings with emery
5.25—Cobalt steel scale
5.26—Tin plate scrap
5.27—18-8 stainless steel
5.28—Vanadium cobalt iron alloy
5.29—Remalloy

ADJUSTING CLUTCH WEAR ON SCREW MACHINES



NO CHATTERING or grabbing: In using Micarta inserts in the friction face of an automatic screw machine clutch body, friction rings can be adjusted back into the friction backs in most cases doing away with the looseness in the threads, according to Westinghouse Electric & Mfg. Co., Mansfield, O. This is said to result in a smoother and quieter operating clutch



Hungry steel mills don't win wars. It takes enormous tonnages of scrap to meet war production goals—140,000 tons of scrap must be collected every day. That's a lot of old boilers, obsolete machinery, abandoned water-towers, worn-out jigs, patterns and molds. If this scrap isn't obtained quickly, steel production will slow down and the whole war effort be imperiled. If you haven't made a start in the nation-wide salvage drive, get in the scrap today. Get out the "junk" that misses routine collections. Call the nearest junk dealer . . . he'll pay you for it and start your scrap on the way to war . . . and Victory. ALAN WOOD STEEL COMPANY, Conshohocken, Pa.

5.30—Remalloy grindings with emery
5.31—Light steel punchings (lighter than 12-gage).

Qualifications of a good plant salvage director are not too difficult to meet. First, he should be an older employe, familiar with all departments of the plant and with its manufacturing methods. He should be a man of imagination and of action, one who will apply the slogan: "What you are not using today, you may never use—scrap it." He must be a man with a keen eye for current scrap and for dormant scrap to be found in the following places, among others:

—At machines: Skeleton steel left after punch press operations, turnings from lathes and chips from automatic screw machines.

—In stockrooms: Parts and subassemblies, or even raw material inventories for discontinued models because of design changes or on hand from overestimates or changes in sales programs.

—In toolroom cribs: Punches, dies, die-beds.

—In plant yards: Old boilers, boiler flues, pipe and foundry molds.

—At out-of-the-way corners of plants: Obsolete or unused equipment.

Old machinery has not yet been given the attention it deserves in the accumulation of salvaged materials. The scrap manager should be qualified to determine when the cost of reconditioning an old machine would show it to be not worth while, and the machine ready to be broken up for scrap. Such scrap from old machines is so-called "nonrecurrent" scrap.

To be effective, a salvage director in any plant must recognize the importance of the foreman and should make a particular effort to stimulate the foremen of production departments to coach machine operators to separate the different kinds of scrap. An operator may be working on a job cutting steel and his foreman may come along and give him a job involving brass. A salvage manager will coach foremen to see that the machine operator in such a case cleans out the steel borings from the bed of the machine so as not to get brass borings mixed in with the steel scrap. Mixed scrap means full value of the scrap cannot be obtained.

The reclamation of aluminum scrap is regarded as of importance next to that of steel. With supplies of nickel, tungsten, manganese and other needed alloys so critical, it is extremely important that scrap metals containing those alloys be separated and collected with care.

The use of separate containers for each class of scrap is necessary for any efficient segregation system. For this, Western Electric has used not only steel drums but also wooden barrels, which are still obtainable and easy to ship to scrap purchasers. Some companies paint the containers for different classes of scrap with different colors for easy, quick identification.

Leather gloves should be supplied to workers baling steel turnings. Western Electric formerly supplied cotton gloves, but analysis disclosed a saving from using leather, except when the waste was oily. In that company's materials conservation, chips and turnings are put through a centrifugal separator to extract and save the oil and to increase the value of the scrap through drying. Mr. Gee points out that not many companies will have enough such waste to justify putting in oil extractors, but that this is one of the functions of the scrap dealers.

Another is to separate the unavoidable mixtures of brass and steel, aluminum and brass, aluminum and steel, nickel and brass. The dealer buys on the basis of the lower quality element, and after the separations sells on the basis of the respective values of the elements.

There are in the United States about 140,000 collectors, dealers and brokers engaged in turning waste materials back into production. It is said that the handling of scrap last year was a $1,500,000,000 industry. Manufacturers and their salvage managers are urged to get their scrap back to the mills through the regular trade channels.

While a number of companies have had good scrap salvage programs in the past, many such companies have found that appointing a salvage manager, giving him responsibility and authority and having him followed up by state or district committees and WPB staff men have greatly increased their recovery of scrap. Large companies with strings of plants are urged to organize committees of their executive officers to quicken the campaign on their own home fronts. Furthermore, Mr. Gee has added technical advisory committees for the various industries with the technicians loaned at the expense of their companies.

Supervision of Bottom Makeup Results in Increased Output

By JOHN HYSONG
Service Engineer
Basic Refractories Inc.
Cleveland

THESE are troublous times for the steelmaker. The phrase, "Hang the expense, get tonnage," is heard on every side. Certainly, any effort on the part of open-hearth operators which will result in more tonnage is well worth while, and the effort of first helpers throughout the land to push their furnaces to the utmost is most commendable.

The idea, however, to "get one out and get another one in," regardless of the condition of the bottom, strikes us as a glaring example of false economy. Bottom delays are extensive nowadays and much of the trouble is laid to poor scrap. Certainly, we are not charging hand-picked scrap and, undoubtedly, a considerable portion of current bottom delays originates with the scrap condition. But it is our contention that many hours of bottom delay can be avoided—with a consequent increase in tonnage—if the furnaceman will take a few extra minutes after each tap to keep his bottoms in condition.

How often we see a furnace tapped, the middle door raised, the bottom hastily dried up in front of the hole, another heat charged, and several hours' bottom delay follow the ensuing tap!

Every basic hearth is refractory to the extent that it contains periclase (MgO) and high-temperature refractory bonds such as calcium orthosilicate. Every bottom is progressively contaminated by impurities. Slag, iron, dolomite and lime penetrate the bottom, are absorbed and replace the original refractory properties. In fact, after a few years' service, practically the only refractories in the working surface is that introduced in normal fettling after each tap.

The refractory problem of the basic open-hearth bottom is not by any means entirely a question of the materials used, but is also a question of how those materials are applied.

Hearth refractories at present are superior to any heretofore available to the industry. They are scientifically designed, graded and sized, and of such uniform composition that they can be expected with proper application to minimize for the furnace operator one of his most serious difficulties —bottom trouble.

The responsibility of maintaining a

(*Please turn to Page* 116)

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Fast!

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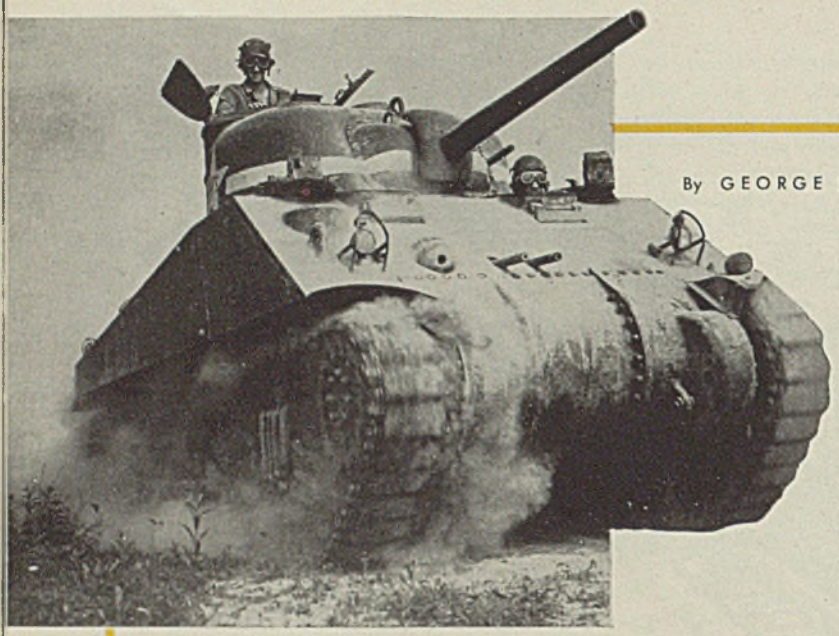
THE WORLD'S LARGEST and Fastest JOB GALVANIZING PLANT

Hanlon-Gregory

GALVANIZING CO. **PITTSBURGH, PA.**



By GEORGE R. REISS

Auto Dealer Becomes

Army Tank Subcontractor

. . . . in one of the most interesting conversion jobs yet made, for it's a long way from repairing automobiles to producing tank components from tough alloy-steel plates

THIS IS A story of how an automobile sales agency became an important subcontractor helping make tanks for the United States Army. Instead of folding up as did so many other automobile sales agencies when there were no more new cars to sell, it is now employing a larger working force, doing a larger volume of business than ever before in its history.

It is the story of how Youngstown Buick Co., Youngstown, O., is doing an essential war production job—one of those jobs that they tell you "can't be done", but it is being done.

This company has no big plants, spread over acre after acre and employing thousands of workmen; as physical size goes, it is comparatively unimportant. But what it has accomplished proves that there is no job "that cannot be done" and that the man who really is looking for war production work can find it—if he wants it badly enough.

In this rapidly expanding little plant today will be found such opeartions as flame cutting, grinding annealing, machining and drilling operations on the tank components being produced. Yet tolerances are being maintained that heretofore were believed virtually impossible; and it is doing the job with a hastily recruited working force of ex-automobile salesmen and ex-automobile mechanics; and it is doing it without interference with what is left of its once substantial automobile sales and service business.

When production of new automobiles was discontinued last winter to permit the automobile factories to go into war production work and to conserve steel, the Youngstown Buick Co., one of the larger sales agencies, was hard hit as were other agencies. It immediately began to study its war-time problems.

"The answer is—," President Eugene D. Hopper told his associates, "get into war production. But what shall we make?"

His associates were mildly—but only mildly—surprised; for they had become accustomed to Hopper's unorthodox ideas, to his willingness to get off the beaten path and successfully accomplish the things that "couldn't be done". Hopper, only shortly before, had become president of the Columbia Machinery & Engineering Corp. of Hamilton, O. — quite an unorthodox thing for an automobile salesman to do.

So the group decided the best possible product for the company to tackle would be a product for which there already was not too much competition; better yet, no competition at all. They hit upon parts for army tanks, cutting plates, boring, planing and machining the tank assemblies.

They sought to interest other Youngstown automobile dealers in forming a war production pool. The other dealers were interested—but skeptical; eager to help—but unwilling to take a chance. So Youngstown Buick went ahead alone.

"The first job," said Hopper, "is to find out if we can get the subcontracts; the second is to get a plant and equipment. If we wait to build a plant and buy new equipment, the war may be over. It will take a year to 18 months. We'll use old stuff."

So Hopper went to one of the largest prime contractors for tank components, and was assured of all the subcontracts that he could handle—although its officials were frankly skeptical of how an automobile agency could handle such a tough job.

Hopper immediately sent the good news to H. W. Gordon, the agency's vice president and sales manager, then began a nation-wide tour in search of tools and equipment. Spending three weeks in traveling widely, he rounded up a second-hand planer here; a milling machine there; grinding, annealing, flame-cutting and other equipment. In those three weeks he spent only one night at home.

Unearth Hidden Talent

Meanwhile, Gordon went to the agency's used car reconditioning department in the basement of the building and ordered: "You've got to move—get out." So the used car department moved upstairs into the service department, then later into another agency's building, leaving only the bare walls and floor in the basement shop. That was last March.

Then came the job of recruiting sufficient skilled help a difficult task for skilled machinists are scarce in Youngstown; and only skilled help could operate the machines. But Hopper and Gordon found plenty of hidden talent in their own and other automobile agencies.

Hopper himself is a skilled metallurgist, having studied that profession in college and having kept up on it during his 20 years in automobile sales work. Then they discovered that Charles R. Walters, one of their crack salesmen, was a skilled machinist, having learned the trade while a boy in his father's backyard machine shop and having worked at it before he became an automobile salesman 20 years ago. They promptly made Walters chief engineer.

Lynn Beil, head of the used car reconditioning department, was made superintendent of the ordnance shop, and he hired automobile mechanics, versatile fellows who are used to making their own parts when the need arises. They came from far and wide, were quickly trained to operate the machines. Meanwhile, many steel executives who visited the plant assured the automobile men,

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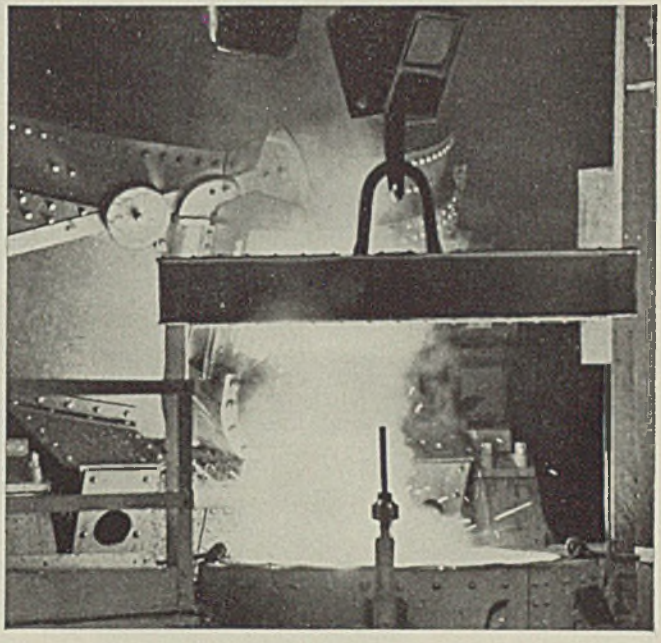
Plastiron is produced by tool steel practice in electric furnaces, from carefully selected materials. It is a fine Disston Steel of very low carbon content—extraordinarily sound, clean and uniform. Special inspection for segregation and porosity insure freedom from pin point pits.

Plastiron carburizes evenly with no hard spots or spongy areas, and is an ideal material for forming difficult shapes.

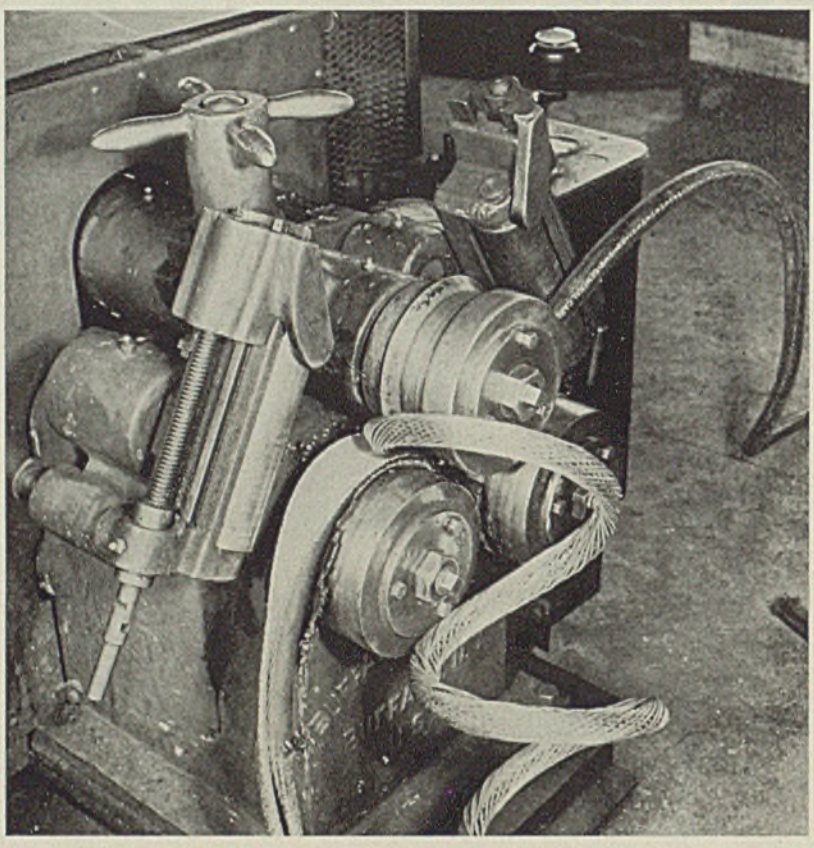
DISSTON METALLURGISTS ARE AT YOUR SERVICE to help work out the most satisfactory application of Disston Plastiron to your individual problems. These experienced engineers welcome an opportunity to show you what this adaptable, non-strategic Disston Steel can do for you. No obligation, of course. Write today to Henry Disston & Sons, Inc., 1126 Tacony, Philadelphia, Pa., U. S. A.



GET YOUR SCRAP IN THE SCRAP!

Uses Bending Roll To

SALVAGE RUBBER



Until recently, general practice at Timken Roller Bearing Co., Canton, O., has been to burn the rubber and cloth insulation off electric cable to salvage the copper.

Seeking a method of salvaging cable rubber, company engineers experimented with a standard Buffalo bending roll machine. This, before experimenting, consisted of three smooth wheels, two of which were in tandem beneath a third which was centered above them. Varying pressures were exerted upon the material to be bent by raising or lowering the upper wheel.

The engineers found that by removing one lower wheel and replacing it with a notched gripper wheel, and replacing the upper wheel with a sharp center-flanged wheel, it was possible to remove the outer layer of cable cloth insulation and the inner layer of fine rubber.

The gripper wheel feeds the cable between the flanged cutter wheel and the pressure wheel, slicing the cable open and peeling it simultaneously. The cloth cable cover drops away from the rubber leaving the rubber and copper cable in a salable condition without further attention. Salvaging is accomplished at the rate of about 6 feet per minute, cables from ⅝ to 2 inches being handled.

This machine in its original form is used regularly in connection with the sheet metal department and is converted to salvage use in about 3 minutes.

"It can't be done."

But it was being done, for the men even set up the machines in the ordnance shop themselves, and erected a monorail handling system.

Still more problems cropped up. There was that of getting the little parts and special tools they needed. Outside machine shop operators, when asked for deliveries, smiled vaguely and promised nothing. So the automobile mechanics set up the lathes and drills and made their own tools and special parts right in the shop. These included reamers and special tools for changing jigs.

And by April 1, Youngstown's smallest ordnance plant was in production, employing a handful of men, *less than a month after they decided to get into production.*

At first the new ordnance plant, crammed in the basement of the sales agency building, handled only the job of drilling and planing the parts, letting out subcontracts to other Youngstown district plants for cutting and straightening. But that didn't prove satisfactory.

So Hopper and his associates rented a small nearby plant, a former stonecutting shop made idle by the war restrictions on building. In it they installed their own flame-cutting equipment, cutting the plates to tolerances previously believed impossible for this cutting method. A steel plant which produces this tough alloy steel saws its product.

All the rest of the shop's tools—the milling machines, grinders, and other equipment — have been redesigned to "bring the tools to the material rather than the material to the tools", for handling heavy component parts and centering them accurately is a time-consuming job. By thus redesigning the tools, the plant has cut regular working time for handling such jobs to a fraction of that of some others doing similar work.

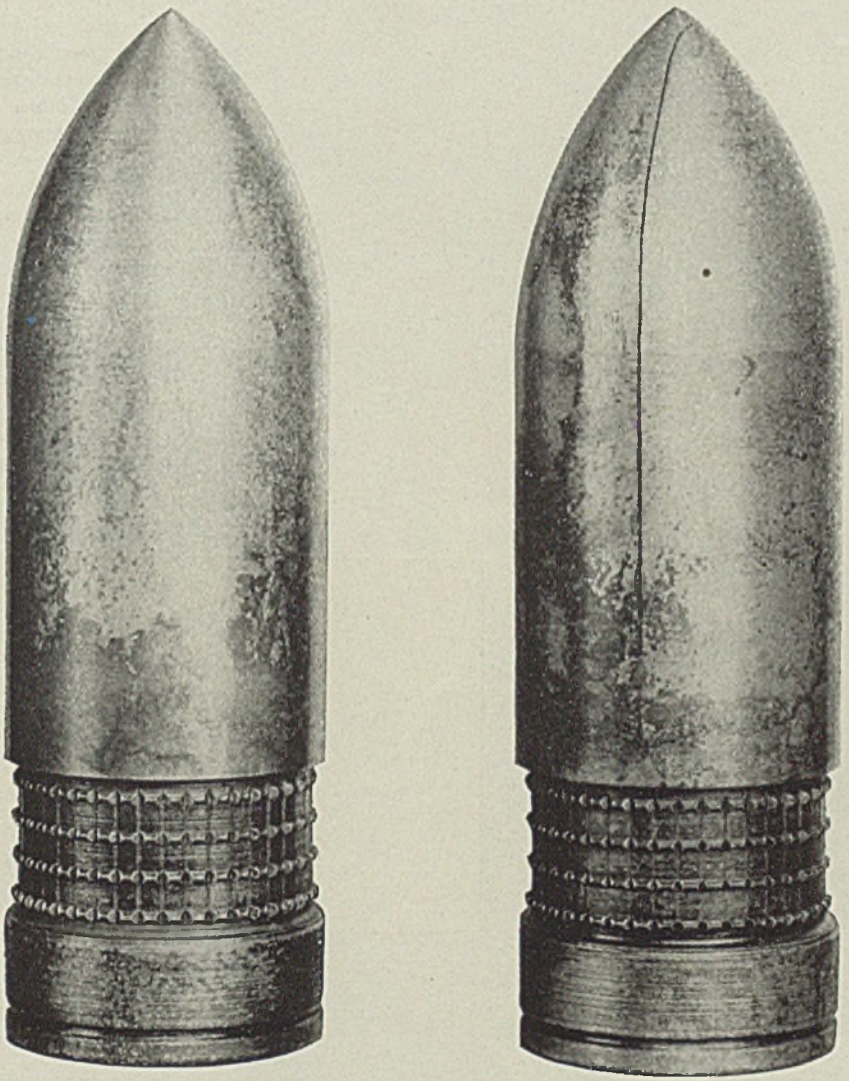
Now the only subcontracting that is let out to other Youngstown district plants is that of straightening the plates.

Now the little company is again enlarging its plant, erecting an addition to the stonecutting works and renting an old warehouse for additional tools and machinery.

Now the company employs over 100 men in the ordnance shop around the clock seven days a week where less than a dozen were originally employed in the used car department. The two departments—ordnance and automobile service—are being kept strictly apart, workers in the automobile service department not being permitted to enter the ordnance shop. However, Gordon supervises both departments. Frank Zane, company secretary, handles all the time slips, records and accounts for both.

One of the problems in getting started, Hopper explains, was that the company's executives and workmen had no one to show them how to handle certain little jobs, there being few workmen with any experience in handling such tough material.

"On the other hand," he comments, "maybe that was the secret of our success. There was no one around to show us the old-time secrets of how to handle those things. We had to work out our own problems—so we weren't hog-tied with the old-fashioned orthodox ideas that couldn't be made to work with this new-fangled stuff."



One died from SHELL SHOCK!

THESE two armor piercing shells *looked* perfect . . . until they were shock tested in three successive water baths . . . cold . . . boiling . . . cold. One *was* perfect. The other cracked . . . was rejected as unfit to fight.

Heating and cooling these baths is just one of countless ways in which General Electric heating, refrigeration and air conditioning are serving war industries.

In recent months, industrial refrigeration and air conditioning have made great strides. Equipment is more compact, more flexible. Temperature and humidity are controlled more exactly. Result: more and better fighting equipment...in shorter time.

After the war, improved process refrigeration should help to make many peace-time products better . . . at lower cost. And vastly improved air conditioning will provide greater comfort in more and more hotels, offices, stores, theatres, homes . . . even in cars, boats and planes.

The wide experience that General Electric engineers are gaining in war work today is your assurance that they will be ready with finer and more efficient refrigeration and air conditioning equipment for the needs of post-war America.

Air Conditioning and Commercial Refrigeration Department, Division 426, General Electric Co., Bloomfield, New Jersey.

Industrial Refrigeration by

GENERAL ELECTRIC

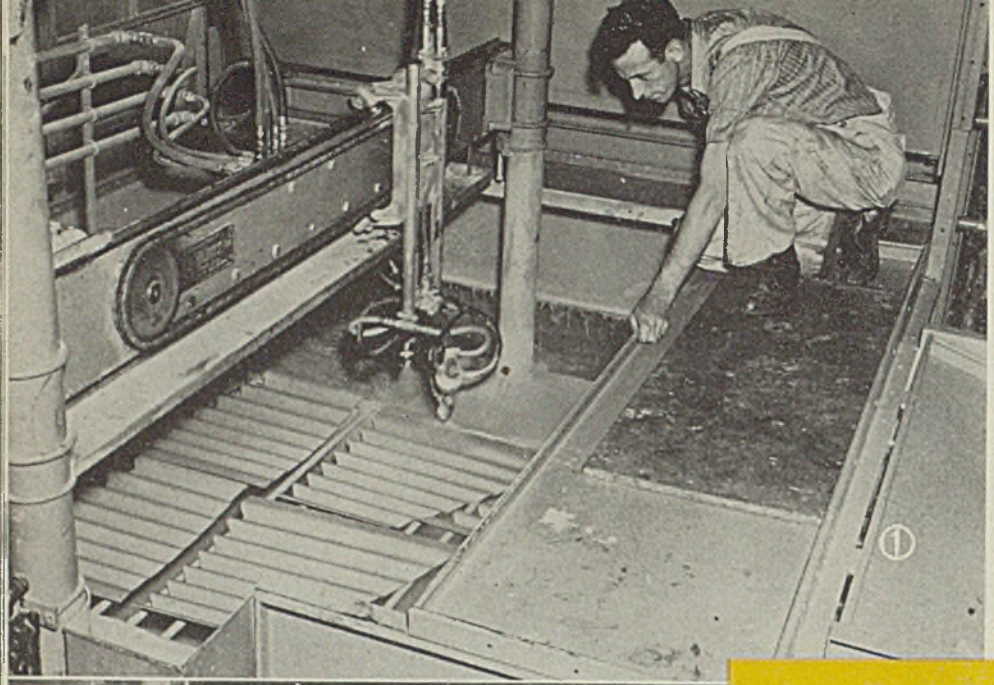
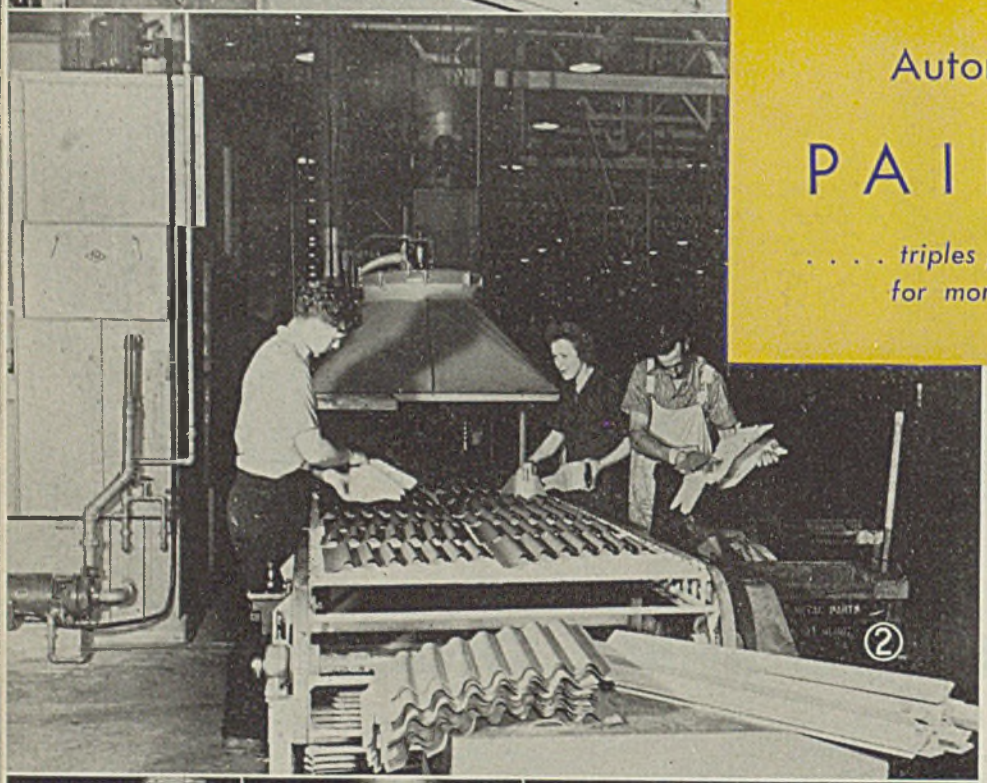
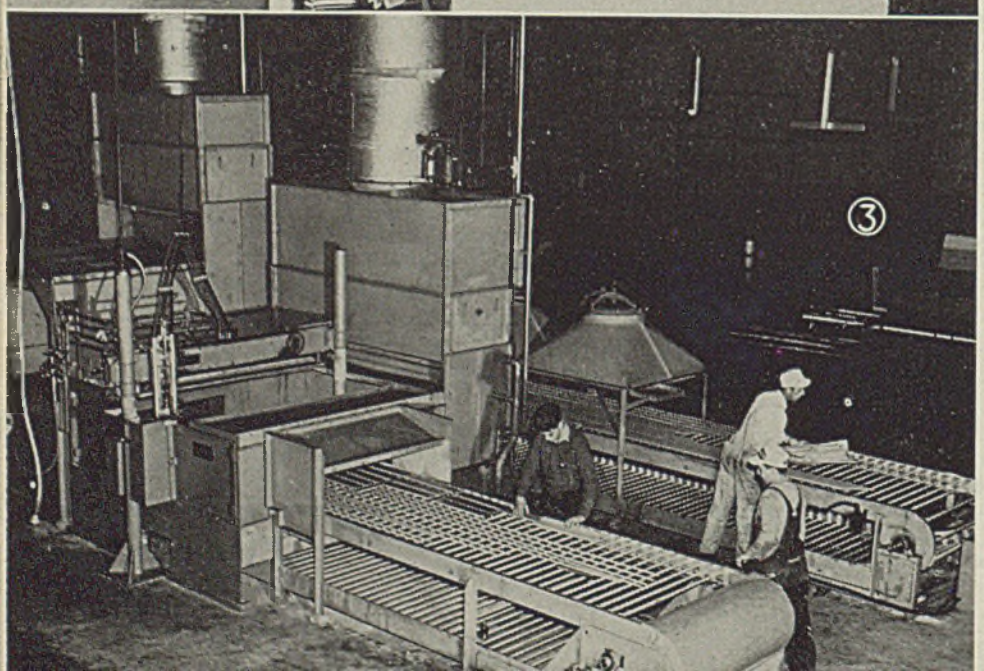


Fig. 1—Whipping across the endless procession of small parts are the automatic spray guns, spreading an even coat of corrosion-resistant paint on the pieces soon to fit into a Martin bomber. Two of these automatic units are employed

Fig. 2—As parts return on the second lap of their journey, they are removed from the conveyor and placed in bins, ready to move on to the production line

Fig. 3—Now painted on one side and dried, parts are turned over on the second conveyor for painting and drying on the opposite side. As they come from the second conveyor, they will be completely covered with a protective coat of corrosion-resistant paint





Automatic Spray

PAINTING

. . . . triples production, frees 10 men for more important work

A ROBOT PAINTER that sprays automatically the multitude of parts that comprise Martin bombers has been installed by the Glenn L. Martin Co. of Baltimore. Operated by five men, the device does in a third of the time the work that formerly required 15 men. Thus 10 men, badly needed for other work, are released from hand-operated spray guns.

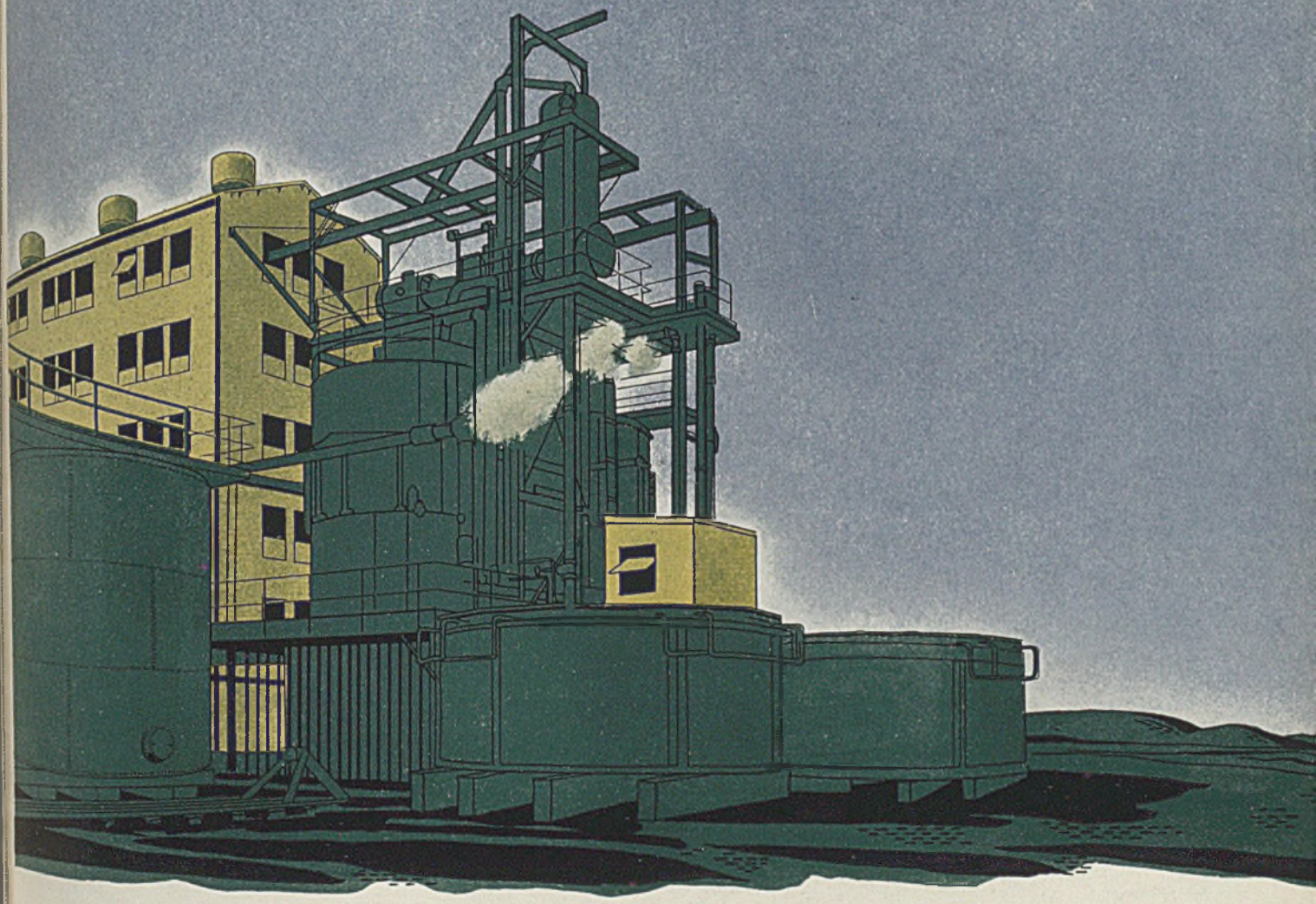
Made for this particular application by a spray-gun manufacturer, numerous refinements and improvements have been added to adapt the machine to aircraft work. One such improvement is the stack and ventilator arrangement which keeps fine particles of paint from being drawn out through the stack into the air over the roof of the building. In the past, such fine paint "dust" presented a fire hazard. Today, the excess paint spray is filtered through a veritable waterfall and is collected in a large tank under the paint racks, later to be skimmed off with ladles.

Other changes in the machine includes the addition of two hand-spray booths on each cycle of the machine, changes in the drying oven and various improvements which were found necessary.

The machine itself is in two banks, or cycles, and works on the endless belt system. Small parts that have first been

DURO

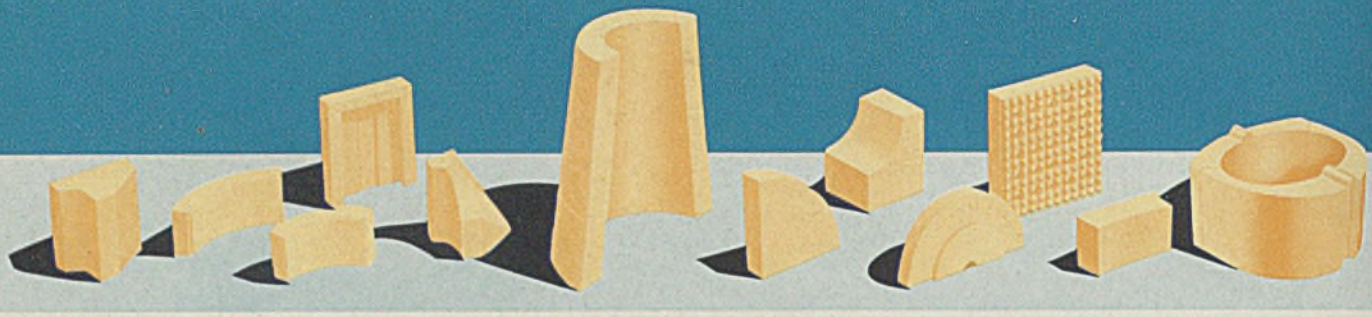
ACID-PROOF BRICK AND TILE



FOR LINING CHEMICAL EQUIPMENT

HARBISON-WALKER REFRACTORIES CO

DURO ACID-PROOF BRICK AND TILE



SPECIAL SHAPES IN DURO MATERIAL

9" Straight

9" No. 1 Arch
4'3" Inside Diameter,
5'0" Outside Diameter
76 Brick to the Circle

9" No. 1-X Wedge
13'6" Inside Diameter,
15'0" Outside Diameter
227 Brick to the Circle

9" No. 1 Key
12'0" Inside Diameter,
13'6" Outside Diameter
113 Brick to the Circle

9"— 48° Side Skew

9" Soap

2" Split

9" No. 2 Arch
1'9" Inside Diameter,
2'6" Outside Diameter
38 Brick to the Circle

9" No. 1 Wedge
4'6" Inside Diameter,
6'0" Outside Diameter
91 Brick to the Circle

9" No. 2 Key
5'3" Inside Diameter,
6'9" Outside Diameter
57 Brick to the Circle

9"— 60° Side Skew

9" Feather Edge

1¼" Split

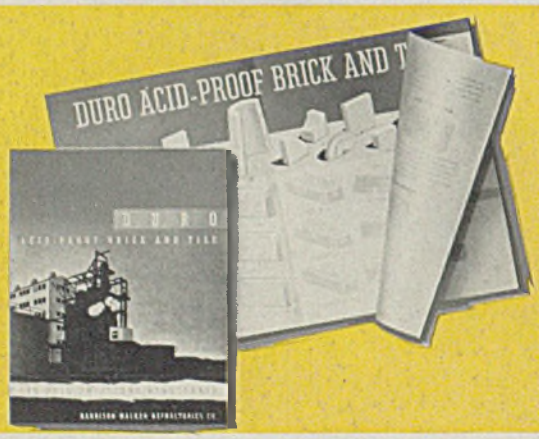
9" No. 3 Arch
0'6" Inside Diameter,
1'3" Outside Diameter
19 Brick to the Circle

9" No. 2 Wedge
2'3" Inside Diameter,
3'9" Outside Diameter
57 Brick to the Circle

9" No. 3 Key
3'0" Inside Diameter,
4'6" Outside Diameter
38 Brick to the Circle

9" T & G Straight

STANDARD
9-INCH BRICK
2½" SERIES



DESCRIPTIVE FOLDER AVAILABLE UPON REQUEST

DURO PRODUCTS

STANDARD 9-INCH BRICK (2½-inch Series)

SCORED BRICK	CIRCLE BRICK	PACKING RINGS
PACKING TILE	FLOOR TILE	SPECIAL SHAPES

HOW HARBISON-WALKER SERVES INDUSTRY

HARBISON-WALKER products comprise refractories of various types and of widely differing properties, and include fire clay, super-duty fireclay, high-alumina, silica, magnesite, chrome and forsterite brick, acid-proof brick, and insulating fire brick. Included also are fire clays, silica clays, various other clays for special purposes, chrome ore, special furnace chrome, furnace magnesite, dead-burned grain magnesite, high temperature bonding mortars and bulk insulating materials.

With a complete line of furnace refractories and insulating materials, Harbison-Walker is able to recommend and furnish the correct combination for any service requirement.

HARBISON-WALKER REFRACTORIES COMPANY

AND SUBSIDIARIES

World's Largest Producer of Refractories

GENERAL OFFICES, 1000 FARMERS BANK BUILDING, PITTSBURGH, PA.

cleaned and anodized are brought in baskets on the overhead chain conveyor system to a station near the robot paint sprayer. These parts are of various shapes and sizes; some of them slated to go into Navy patrol bombers, other into the construction of bombers for the Army and the British.

Taken from the baskets, the pieces are started on their journey through the robot sprayer. Placed on the cross-bars of the endless belt, they are first carried under a set of overhead spray guns that whip back and forth across the moving pieces. As the belt continues to move, the parts are carried through an oven equipped with infra-red lamps designed to speed the drying process, and then through a second drying unit where numerous fans force warm air on the parts.

The infra-red lamps are so arranged that they may be turned on in units of four or more, depending upon the type of paint being used at the time.

Numerous parts, after having passed through the ovens, now completely dry and painted on one side, are taken from the conveyor which comprises the first cycle of the operation, turned over and placed on the other conveyor which travels in the opposite direction. Thus, the second cycle in the operation, a duplicate of the first, is started. When the pieces have reached the end of the second cycle they are completely covered with a primary coat of anti-acid paint which is designed to eliminate so far as possible the action of the corrosive elements on the metal.

The whole process, from the time the parts are started on their way through the machine until they have been removed and sent on to finished parts stock or the assembly line, takes about 15 minutes.

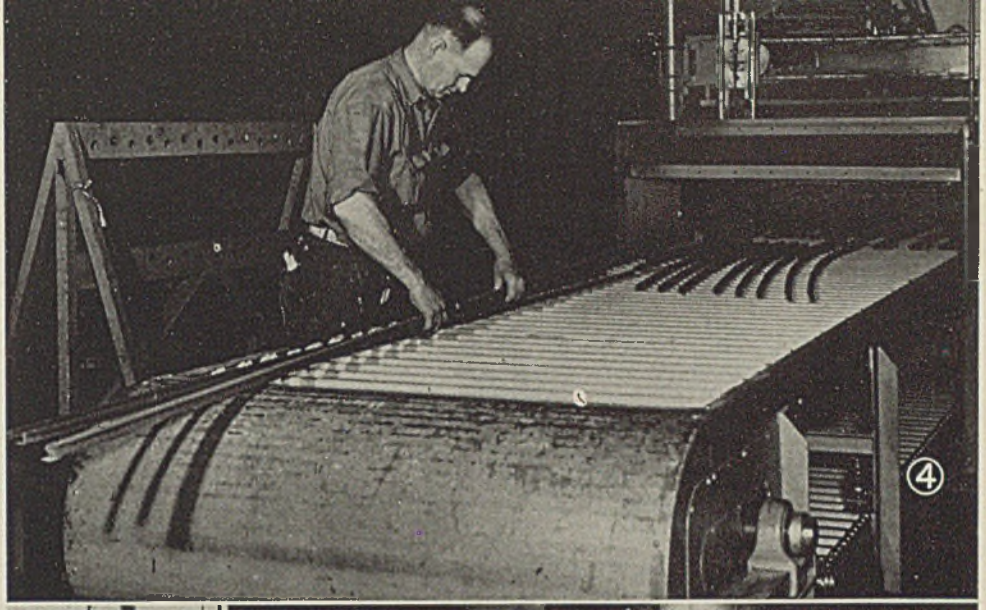


Fig. 4—Small parts, vital sections of Martin bombers, first receive a primary coat of protective paint. Here they start through the robot painter on the conveyor mechanism. Automatic spray equipment with 3 men does same work 15 men formerly did and does it in one-third the time

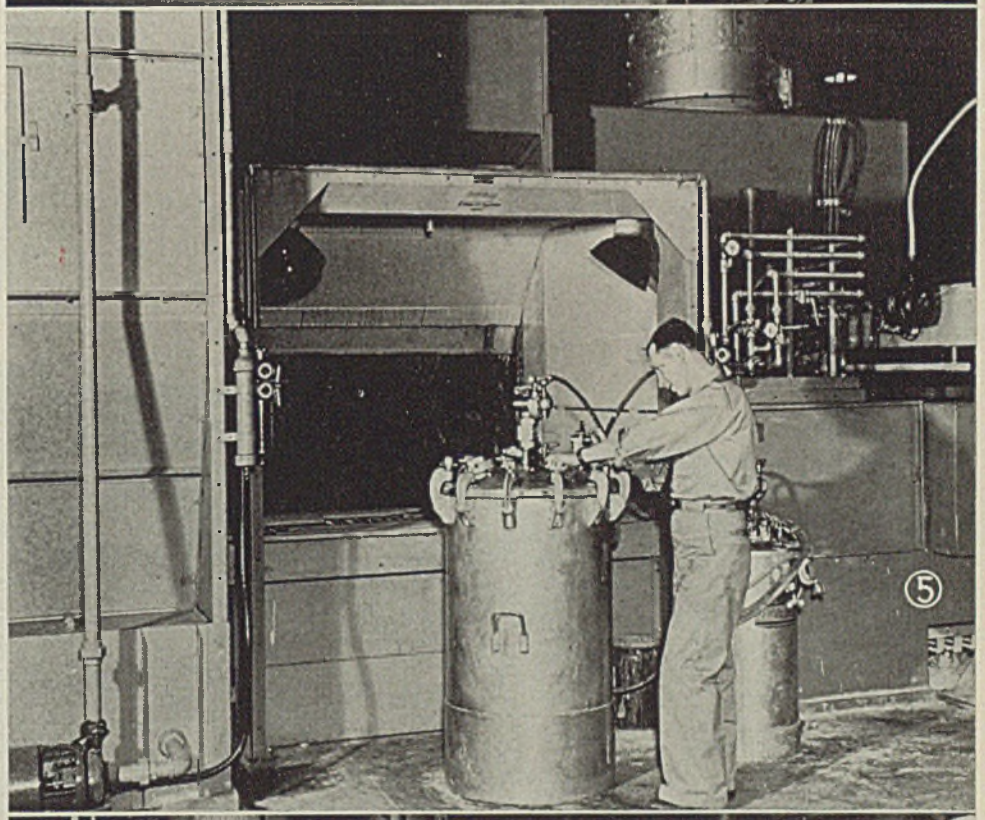


Fig. 5—Fine paint spray and fumes are sucked up through a ventilator stack, screened by a "waterfall" which serves as a filter to remove the highly inflammable paint "dust" from the air. Paint is kept in pressure vat, foreground, and constantly agitated. Tubes from vat feed paint to overhead sprays

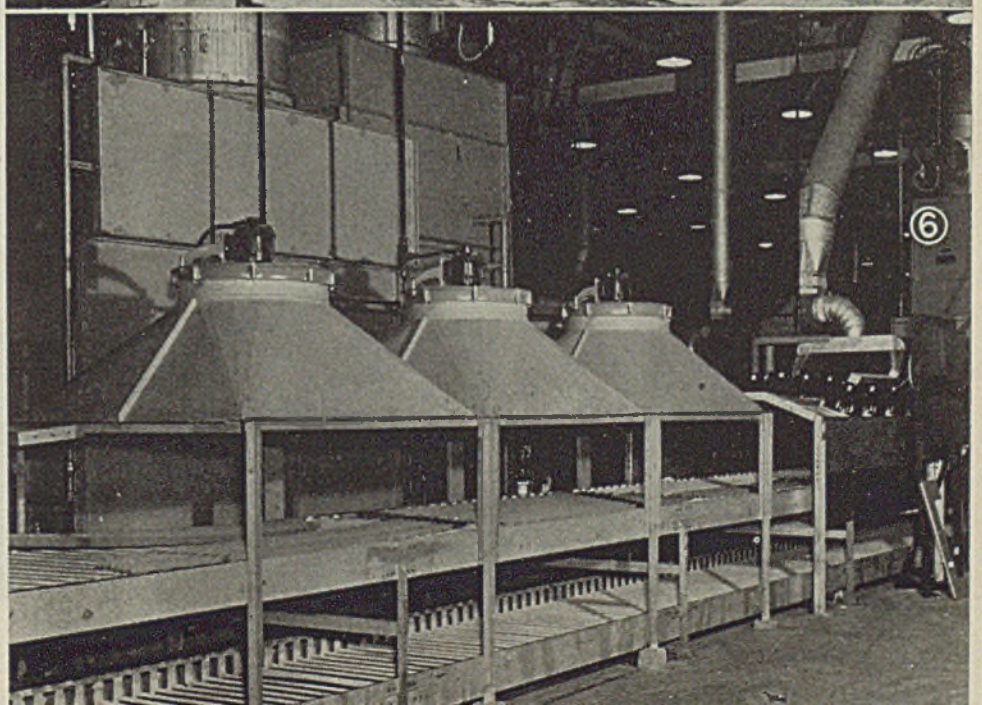


Fig. 6—After passing under sprayer and through ventilator unit, freshly painted parts moved through infra-red oven and fan dryer. Coming from dryer, parts are removed from belt, turned over and started on second phase of their journey

AMORPHOUS GRAPHITE in the Open-Hearth

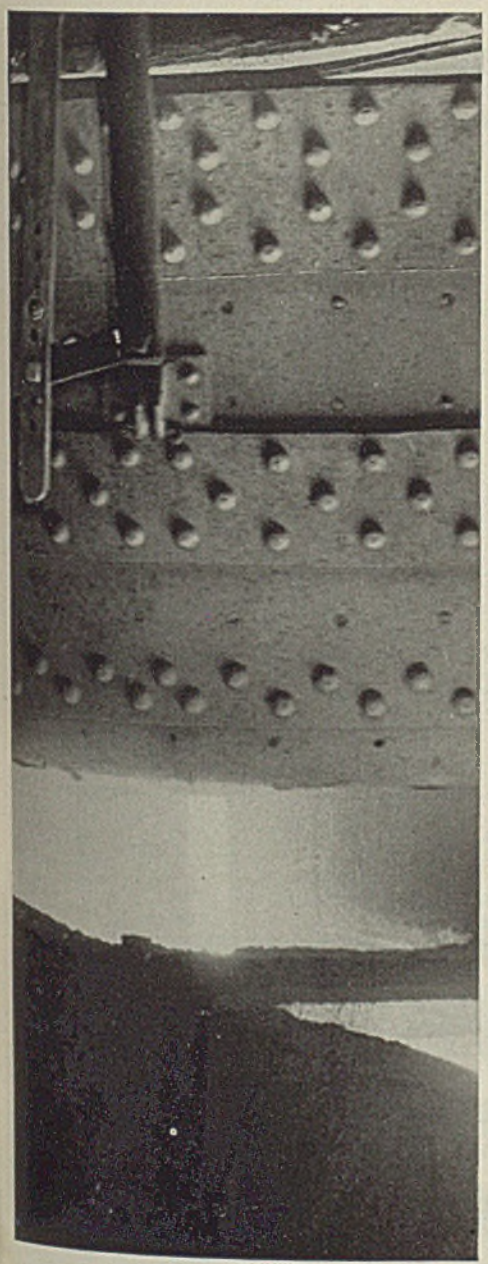
(Concluded from last week's issue)

NATURAL amorphous Mexican graphite has many characteristics which make it an ideal super-refractory ingredient under molten metal and slag. (1) Its high coefficient of heat transfer makes the body containing it highly resistant to sudden, violent temperature changes and avoids spalling and cracking. (2) Its lubricating action provides low-friction, "greasy" surfaces which allow no foreign body adherence, such as residual metals and solidified slags. (3) Practically infusible, it will not melt or change its character under the action of molten steel. (4) Neutral and chemically inert, its presence insures resistance to fluxing and corrosive action of molten metals and slags.

Since graphite oxidizes slowly at a red heat in the presence of air, it has

not been used extensively in refractory brick mixtures or where it is subjected to direct flame impingement. However, because of the above-mentioned beneficial properties, Mexican graphite is now being used extensively in prepared ramming mixtures used for monolithic linings of open-hearth furnace steel and slag spouts and ladle bottoms, as well as for nozzle-well packing. In the grey iron and nonferrous industries even the melting units are lined with mixtures containing Mexican graphite.

Oddly enough, when graphite is mixed with clay and broken brick, it is held so firmly within the body by the bonding action of these materials that practically none is lost by solution into molten steel, even though graphite is a form of carbon which when exposed alone is extremely soluble in molten steel. No carbon pickup has been noted over a period of thousands of tons of steel poured onto Mexican graphite refractory bodies. Even low-carbon rimming steel does not seem to dissolve carbon from the lining surface, although the high (over 20 per cent FeO plus Fe_2O_3) iron oxide slags in evidence over ingot iron (below 0.03 per cent carbon) have produced a foaming reaction caused by liberated and entrapped carbon gases. Exceptionally long lining life can be obtained in shops pouring killed and semi-killed steels.



Graphite will not melt or change its character under the action of molten steel; hence, its suitability for ladle stopper heads, mold coatings, hot topping, etc.

Because Mexican graphite will not fuse together, it has no bonding power in lining mixtures; and so it is necessary to use a clay bond. Since normally not more than 20 per cent Mexican graphite is needed in the mixture, the balance of the bulk is made up of broken brick or grog, such as ganister or magnesite, depending upon the steel process being used. A typical mixture would be one part of Mexican graphite, two parts of broken brick, and two parts of bonding clay. For easy admixture and to provide proper ventage, an especially sized graphite may be purchased under the tradename of "Mexaloy." This is packaged in 100-pound lots in cloth bags for easy handling.

The lining technique is rather simple. After thorough mixing of the ingredients, water is added gradually and cut into the mixture until a moist tamping consistency is reached. Usually about 8 per cent water is sufficient for the correct consistency, which can easily be determined by a simple hand test. If a bit of the mixture is balled up in the hand and worked and if it does not cling to the fingers but forms a hard, firm, dry-looking ball, it is about right. If too wet, it will puddle under the tamper and form moisture cracks when drying; and if too dry, it will not pack down firmly and stay in place. After cleaning away loose particles from the surface to be lined, the loose material is shoveled into and leveled over the entire area. About one-half more thickness of loose mixture is used as desired in the finished hard tamped body. After smoothing carefully and removing any lumps, the whole area is firmly tamped into place by hand tamping or with an air rammer. Normally, a finished thickness of about 3 inches is desired for open hearth runners and 5 inches for large ladle bottoms. Drying may be done with a slow wood fire or with a gas torch if one is available. Drying should be carried on until all moisture has escaped and the shell casting is hot.

By R. J. ZEMANEK
Chief Metallurgist
United States Graphite Co.
Saginaw, Mich.

Open-hearth furnace runners in basic shops are usually covered over with a layer of loam to a depth of a few inches over the brick. This loam seldom lasts for more than one heat and is washed away into the ladle every time the furnace taps, after which solidified steel and slag are "crowbarred" away from the brick and a fresh covering applied. This loam washing into the steel may provide inclusion material and reduce the quality of the steel. A runner lined with a Mexican graphite mixture will always last more than 10 heats and as long as 30 heats on high-carbon steel so that the inclusion question is practically eliminated. Normally, only a bottom pad of the special lining need be employed, while the sides of the runner which do not cut away can easily be made up with the cheaper loam mud.

Methods of bricking spouts when using the Mexican graphite body are shown in Sketch I. Means for protecting the entire runner is shown at *A;* and, for the bottom pad only, at *B.*

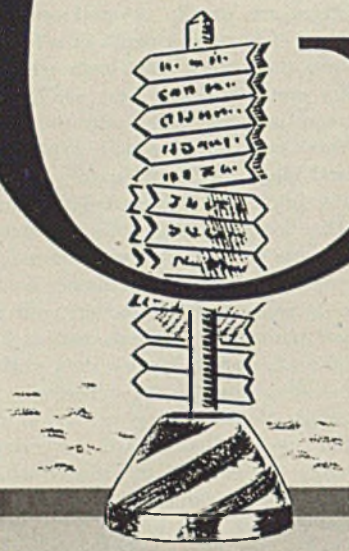
One steel company reports that its runner brick lasted two furnace campaigns when they protected the bottom with the special mixture and they averaged well over 10 heats per lining. At no time was it necessary to use the bar to free solidified metal or slag from the runner bottom. Second helper's work is easier also and especially in hot weather.

Ladle bottoms also are being lined with Mexican graphite mixtures over the brick, and records show that bottoms will outwear the sides two or three times and skulls are much easier to remove. The largest ladle thus far lined in this manner holds 70 tons of steel, while there are several smaller installations.

Another important place for natural amorphous Mexican graphite which makes use of its refractory and lubricating properties is for coating ingot molds and preparing them for easy stripping. Only pure and unadulterated graphite may be used for this purpose, as the addition of clay or other foreign substance will only add inclusions and cause sticking in the molds. Both spray coatings and dip coatings are employed, and sometimes a dip coating is followed by a spray coating of tar or pitch usually for alloy steels.

The Mexican graphite particles are carried into all of the mapped areas of the mold and the coating lies on the flat surface in a smooth uniform manner so that all parts touched by molten metal are protected. The suspension normally

Guide



FOR MORTARS AND PLASTICS

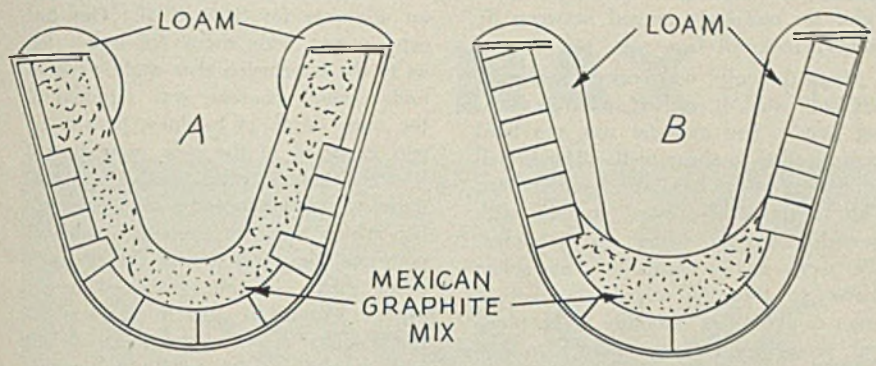
TYPE OF WORK	MORTAR OR PLASTIC	TEMP. USE LIMIT, F.
Laying up dense firebrick		
with a high bond	B&W Air-Set Mortar	3025
with an air seal and cushion joint	B&W High-Temperature Mortar	3150
Laying up insulating firebrick with a heat-setting bond	B&W K-20 Clay	2000
	B&W IFB Mortar	3000
Laying up insulating firebrick with an air-setting bond	B&W Smoothset Mortar	2800
	B&W Air-Set Mortar	3025
Coating the face of dense firebrick	B&W High-Temperature Mortar	3150
	B&W Air-Set Mortar	3025
Coating the face of insulating firebrick	B&W IFB Mortar	3000
	B&W Chrome Mortar	3100
	B&W Green Refractory Paint	—
Laying up and coating firebrick to resist slag	B&W Chrome Mortar	3100
Shallow patching	B&W Air-Set Mortar	3025
Deep patching	B&W Plastic Moldable	3000
Pouring new baffles; casting special shapes; lining doors, car tops, etc.	B&W Baffle Mix (Type A)	2600
Ramming new baffles, repairing oil baffles, etc.	B&W Baffle Mix (Type B)	2600
Molding special shapes, capping walls, forming burner openings, forming small door openings, lining inspection and access doors in high-temperature zones, etc.	B&W Plastic Moldable	3000
Hearths and furnace bottoms, stud tube boiler walls, corbels, etc., where resistance to slag and abrasion is required	B&W Plastic Chrome Ore	3250
Cast or rammed insulating shapes and panels; lining flues and ducts; lining access, explosion, inspection and lance doors; steel stacks; insulating furnace hearths and car tops	B&W K-20 Concrete Mix	2000
	B&W K-22 Concrete Mix	2200

This chart is designed to simplify the usually complex problem of selecting the correct refractory materials for a wide range of uses. It is a condensation of the experience of one of the leading manufacturers of refractory mortars, plastics and castables. Copies suitable for filing or wall mounting will be gladly supplied on request.

THE BABCOCK & WILCOX COMPANY
Refractories Division, 85 Liberty Street, New York, N. Y.

BABCOCK & WILCOX

R-158.



Sketch I—Methods of bricking open-hearth furnace spouts with Mexican graphite body

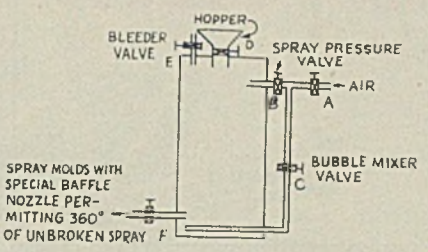
used for covering is one part of Mexican graphite powder to three parts of water, while many operators find that a 1:2 ratio is worthwhile for even better protection and stripping.

The several advantages of Mexican graphite has led many operators to use it as a mold coating during the present emergency and heavy production. (1) A line of 24 molds and stools may be coated on the pouring stand in less than five minutes with simple, inexpensive spray equipment. (2) Where a mold shortage exists, the needed molds may be coated for use shortly after stripping, inasmuch it is safe to spray Mexican graphite on molds as hot as 800 degrees Fahr. and get a usable coat. With tar, molds must not be hotter than 400 degrees Fahr. or else the tar will coke. (3) Mexican graphite gives off no obnoxious fumes, only the clean steam from the evaporating water used as a carrier. Tar, of course, gives off heavy choking fumes when hot sprayed and presents a tough thing for the men to work around. (4) Mexican graphite presents no problem in objectionable mold design, whereas tar sometimes causes soft-cornered ingots on square molds of certain corner radius. (5) Tar must be applied hot and, therefore, must be continually recirculated and heated in order to get results. It is messy to handle and the pumping operation is done with difficulty while entrapped air causes foaming. None of these objections apply to Mexican graphite which uses cold water as a medium for suspension with a gentle air stream at the tank bottom to keep the mass stirred. (6) Graphite is easier to handle since a fresh batch is made up easily and quickly with water and ready for immediate use. No space is necessary for heavy equipment, and the entire apparatus is easily operated by one man who can move the spray tank wherever it is needed.

The low coefficient of friction of graphite makes it ideal for molding coating, as the "greasy" surface causes the ingot to slide out of the mold easily. This natural solid lubricant is smeared on the mold surface and gradually a graphoid layer is built up which accounts for the easier removal of ingots from molds regularly coated with Mexican graphite.

The equipment for spraying, as shown in Sketch II, requires only a 50-gallon tank, some lengths of iron pipe, a few valves, and chipping hammer base. Regular air pressure of about 90 pounds is sufficient for operation.

In operation of the spray device valves, *C D E* are closed while *A B F*



Sketch II — Spraying equipment used for coating molds with graphite

are open. When spraying is over, valves *B* and *F* are closed while valve *C* is cracked open slightly and valve *E* opened to provide enough air to prevent settling of graphite in the tank. When the tank is filled, the valve *A* is closed and *D* opened so that more spray mixture may be introduced.

When using a graphite dip, it is customary to first dip the hot molds into a tank filled with water. This cools the molds and removes surface dirt after which the molds are lowered into the graphite tank for coating. The proper suspension is measured by a flotation test, and additional water and powdered Mexican graphite are added as needed. The usual suspension density is determined by a settling test in a test tube graduate. Ordinarily 80 cubic centimeters of sludge in a 250 cubic centimeter graduate works satisfactorily, and this is checked every few hours depending upon the number of molds dipped. Usually a paste of Mexican graphite and water is stirred up to a cream-like consistency in a mixer before adding to the tank and this prevents lumping.

The mold wash tank should be agitated with air and be provided with a false bottom which can be removed from the tank to lift out any accumulated scale or dirt. The air pipe is fanned out over the bottom and protected by steel rails to prevent damage if a mold should be lowered too far into the tank.

The mixture in the tank should be occasionally tested for impurities or an ash test run on the sediment. When the ash is over 30 per cent, the tank should be drained, cleaned, and refilled to prevent ash inclusions from being picked up by the ingot during teeming.

Some shops use a heavy Mexican graphite slurry on their stools, especially where high-silicon and high-carbon steels are poured, as these usually cut stools badly unless they are protected. A thick paste about 60 degrees Baume is made up, and this is swabbed onto the stool surface before setting the molds.

A 200-mesh powdered Mexican graphite is best for mold coatings and is available with or without a binder. Commercially, the pure graphite mold wash is known as "No. 90 Mexican graphite ingot mold wash;" while with a binder, it is sold as "No. 90-B."

Proposed Wire Rope Practice Before Industry

A proposed simplified practice recommendation for wire rope designed to conserve strategic materials and available productive capacity for the war program and at the same time to adequately care for important consumer requirements is now before producers, distributors, users and others interested for approval or comment, according to the Division of Simplified Practice, National Bureau of Standards, Washington.

General adherence to the twenty tables shown in this recommendation will result in a net reduction in variety, from 973 items to 648.

The major production and use of wire rope, and therefore the predominant tonnage is covered by four different rope constructions where the reduction in variety is from 352 items to 182.

The proposed recommendation was developed by the contact committee of the Wire Rope and Strand Manufacturers Association, and submitted for passage through the regular procedure of the Division of Simplified Practice, at the request of the Wire and Wire Products Section, Iron and Steel Branch of the War Production Board.

Heavy Equipment Manufacturer Reports On Successful Applications of . . . .

NE (National Emergency) ALLOY STEELS

By G. C. RIEGEL
Chief Metallurgist
Caterpillar Tractor Co.
Peoria, Ill.

IN ALL PROBABILITY, the engineers and metallurgists who have to cope with the present conditions of stringency in both steel and its common alloys are anxious to learn what has been the experience of others under the same circumstances.

Having advocated as early as October, 1938, the use of residual alloys in steel manufacture for application in our products requiring deep-hardening steels, Caterpillar Tractor Co. quickly began the testing of mill heat quantities of the NE steels even before they had been coded with NE symbols.

Our first three heats were on order the day after the attack at Pearl Harbor. Since that time, our firm has consumed, in various items of its product, in excess of 60 mill heats of NE alloy steels. Through August, 1942, a survey showed that there had been made approximately 125 mill heats of NE alloy steels throughout the country.

We have applied the following NE steel types as alternates for the standard SAE compositions: NE 8024, 8447, 8620, 8630, 8724, 8739, 8744, 8749, 8817 and 9460. All of these mill heats of NE alloy steels were subjected to the Jominy or "end quench" test, tension tests, notched bar impact tests—generally the keyhole Charpy type—cold bend tests and production tests of forging, annealing, machining, hardening and the accompanying evaluations of distortion.

The NE 8024 was used in place of the former SAE 3115. Its annealed hardness ranged from 4.6 to 5.0 millimeters brinell. Little distinction between the machinability of this material and that of the former SAE material could be noticed. The hardness "as quenched" on carburized specimens ranged from 57 to 65 rockwell C. The hardness when tempered at 360 degrees Fahr. for one hour ranged between 57 and 61 rockwell C.

Much difficulty was encountered with NE 8447 when it was hot rolled to shafting sizes. The material was too hard as hot rolled to shear well. The brinell equivalent was as hard as 3.2 millimeters. This material also gave trouble with quench cracking when oil hardened. We were finally compelled, on spline shafts, to time quench in hot oil in order to avoid this difficulty. The physical properties after tempering to 800 degrees Fahr. were comparable to those obtained from SAE 3250. When tempered at 1000 degrees Fahr. the brinell hardness was 3.3 to 3.5 millimeters. When tempered at 1180 degrees Fahr. the hardness was 3.7 millimeters.

For these reasons, we have been reluctant to use the high manganese, higher molybdenum combinations, of the NE steels. The NE 8200 to 8500 have disappeared from our specifications, both on account of the difficulty in hardening from the finishing temperature in hot rolling or forging, and also because of the high molybdenum content.

NE 8600 series has proved very satisfactory, NE 8620 being an excellent alternate for SAE 4615 or 4620. The machinability is equally good and the hardness of carburized parts "as quenched" ranged from 57 to 67 rockwell C, the latter being somewhat harder than we obtained on the "as quenched" SAE 4615 and 4620. When tempered to 400 degrees Fahr., the hardness range was 57 to 60 rockwell C.

The NE 8630 has fulfilled the requirements formerly specified for SAE 4130; in fact, it showed higher notch toughness and cold bend at 50 rockwell C than either SAE 4130 or 3130.

The NE 8724 has been employed as an alternate for SAE 4820. Our first experiments with these NE steels led us to the conclusion that slightly higher molybdenum content was required if the same depth of hardness penetration was expected in the core properties of heavy-sectioned gear teeth. Accordingly, we have adopted a modified practice which tends to keep the molybdenum near the maximum of this grade in order to be interchangeable with our former SAE 4820 steel in our applications. The annealed hardness of this grade ran from 4.4 to 5.0 millimeters brinell. When the annealed hardness of this grade was allowed to become softer than 4.8 millimeters, the machinability became poor—that is, poor finish was encountered on Gleason and Fellows' shaped gear teeth.

In the range of 4.4 to 4.7 millimeters brinell, the machinability was found to be superior to SAE 4820. The hardness of this steel after carburizing and quenching ranged between 57 and 67 rockwell C. After tempering at 400 degrees Fahr., the hardness ranged between 57 and 62 rockwell C. Slightly more distortion was encountered on this grade due, possibly, to the higher hardening temperature.

NE 8739 and 8744: NE 8739 has been used as an alternate for SAE 3140 and has given an excellent response, both in heat treating and machinability. The NE 8744 has been used as an alternate for SAE 3240, 2340 and 2345. In this respect, when the manganese is kept toward the middle to the high side of the range, the hardenability as measured on the Jominy, or "end quenched" test, is equivalent, or superor to either of the two SAE steels mentioned. The notch toughness and yield strength in the same hardness range show no unfavorable comparison with the SAE 3240, but are slightly below those of the SAE 2345.

In all of these applications, it might be cited that notch toughness tests were conducted at both +75 and minus 20 degrees Fahr. based on the foot-pound values derived from the key-hole type Charpy specimen. Rarely did the foot-pound values drop more than 25 per cent at minus 20 degrees Fahr. as compared with those obtained at plus 75 degrees Fahr. It also should be said that all of the steels discussed were made to fine-grain practice ASTM 5 or finer.

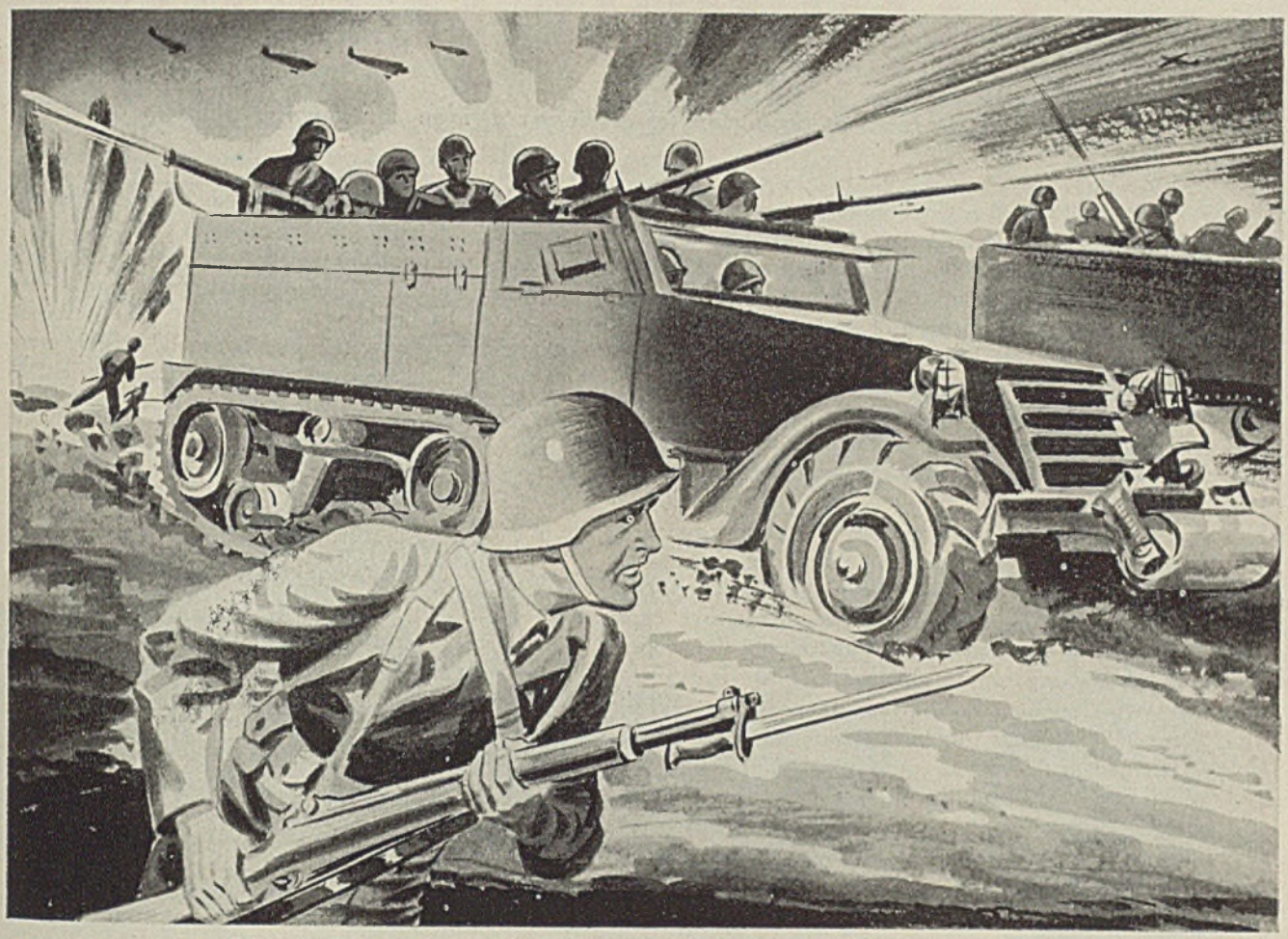
Of the few heats of NE 8749 with which we have had experience, the annealed hardness ranged from 4.1 to 4.2 millimeters brinell. The machinability

(*Please turn to Page* 96)

From paper presented at 1942 National Metal Congress, Cleveland, Oct. 12.

For other information and complete history of development of NE steels, see STEEL, Feb. 9, 1942, p. 70; Mar. 16, p. 72; June 8, p. 66; June 15, p. 66; July 20, p. 86; Aug. 3, p. 70; Aug. 17, p. 40; Aug. 31, p. 41, p. 76; Sept. 7, p. 78; Nov. 9, p. 96; Nov. 16, p. 106. For latest list of NE steels, see p. 96, this issue.

N-A-X *9100 Series*



attacks with the *half-tracks*

Rumbling, pitching, and rocking over rugged terrain, our army's half-tracks have to be able to "take it" where the going is the toughest. And N-A-X 9100 Series of alloy steels fulfills many exacting applications in these hard fighting war machines.

N-A-X 9100 Series is basically an alloy steel, with all strategic elements carefully balanced and held to an absolute minimum. The use of N-A-X 9100 Series in hundreds of war time products conserves critical alloying elements without impairing quality.

Used as (1) a High Tensile Grade; (2) a Medium and Deep Hardening Carburizing Grade; (3) a Medium and Deep Hardening Constructional Grade, N-A-X 9100 Series combines toughness and machinability. Deep hardening characteristics are greater than, or equal to, the higher alloyed steels. N-A-X 9100 Series is supplied in two general grades, with and without molybdenum, all other components of the analysis being held constant.

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SCRAP IS VITAL TO STEEL PRODUCTION . . . GET YOURS IN FOR VICTORY!

Efficient Handling

. . . . features production of artillery cartridge cases in this plant

CHANGEOVER from peace to wartime production frequently makes it necessary for a manufacturer to equip his plant to produce items entirely foreign to those of his usual business. Such is the case with a well-known manufacturer of steel sheet. This company had had very little experience in drawing metal, especially brass, but with the aid of experienced advisors, a competent engineering staff, and a battery of H-P-M Fastraverse self-contained hydraulic presses, it now is producing a large number of 105-millimeter cartridge cases.

Production of these artillery cartridge cases involves a series of progressive redrawing operations. Starting with a flat disk of cartridge case brass, the first pressing operation forms the disk into a cup. This cup is then redrawn four times until the proper depth and section are obtained.

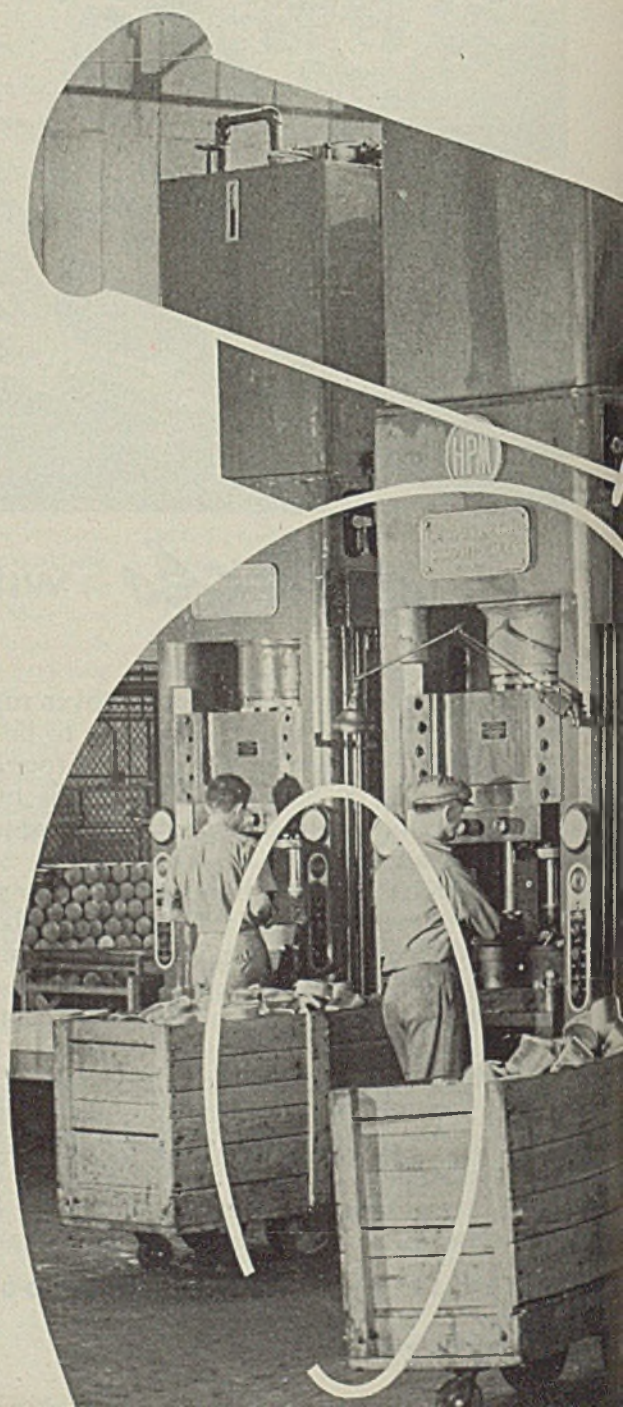
When cupping or drawing, the case is "pushed through" the draw ring in the lower die by the punch fastened to the moving press slide. The return upward movement of the press slide strips the case from the punch. Each press has a cored hole in the press bed, permitting the cases to be ejected through the bed.

Handling from the press employs a unique type of automatic conveying system. Wire-type conveyor tubes connect the bottom of each press with a washing tank located directly behind. See Fig. 2. At every press cycle, a case is forced into the washing tank. This is accomplished automatically without manual or mechanical aid, and without any damage to the case. Washing is necessary after each drawing operation to remove drawing compound prior to furnace annealing to relieve drawing stresses. After annealing, cases are pickled to remove scale.

The method of handling employed is called the "batch" process. After washing, cases are placed in steel baskets and started through a continuous furnace. As soon as the cases are removed from the furnace, they are transferred to wooden baskets, then submerged in pickling tanks. A manually operated electric hoist handles the baskets during the pickling process. After the scale has been removed from the cases, the baskets are emptied and the cases are stacked in suitable bins and delivered by electric truck to the next drawing press.

Fig. 1 shows a line of presses working on the various draws which are handled in sequence through the series of draw, wash, anneal, pickle and redraw operations. The equipment needed is set up for efficient flow of work as will be seen in Fig. 3.

After the fourth draw, the cases are trimmed to a uniform length. The closed end of the case is then ready to be headed and indented. This is accomplished in one operation by a hydraulic heading press. After heading, the cases are transferred to an H-P-M tapering press which tapers the open end of the case



so that it will fit around the projectile and also fit the breech of a gun.

The arrangement of equipment was specially worked out for efficient material handling, and the presses employed are result of a standardization program that has done much to permit such production lines to be set up quickly.

A complete range of H-P-M Fastraverse cartridge case presses is available for shell sizes of 75-millimeter to 6-inch inclusive. Due to the fact that there are many shell sizes and also a number of case sizes for each size shell, a multiplicity of press tonnages, daylights, strokes, etc., would ordinarily be involved to meet exactly the minimum in press requirements.

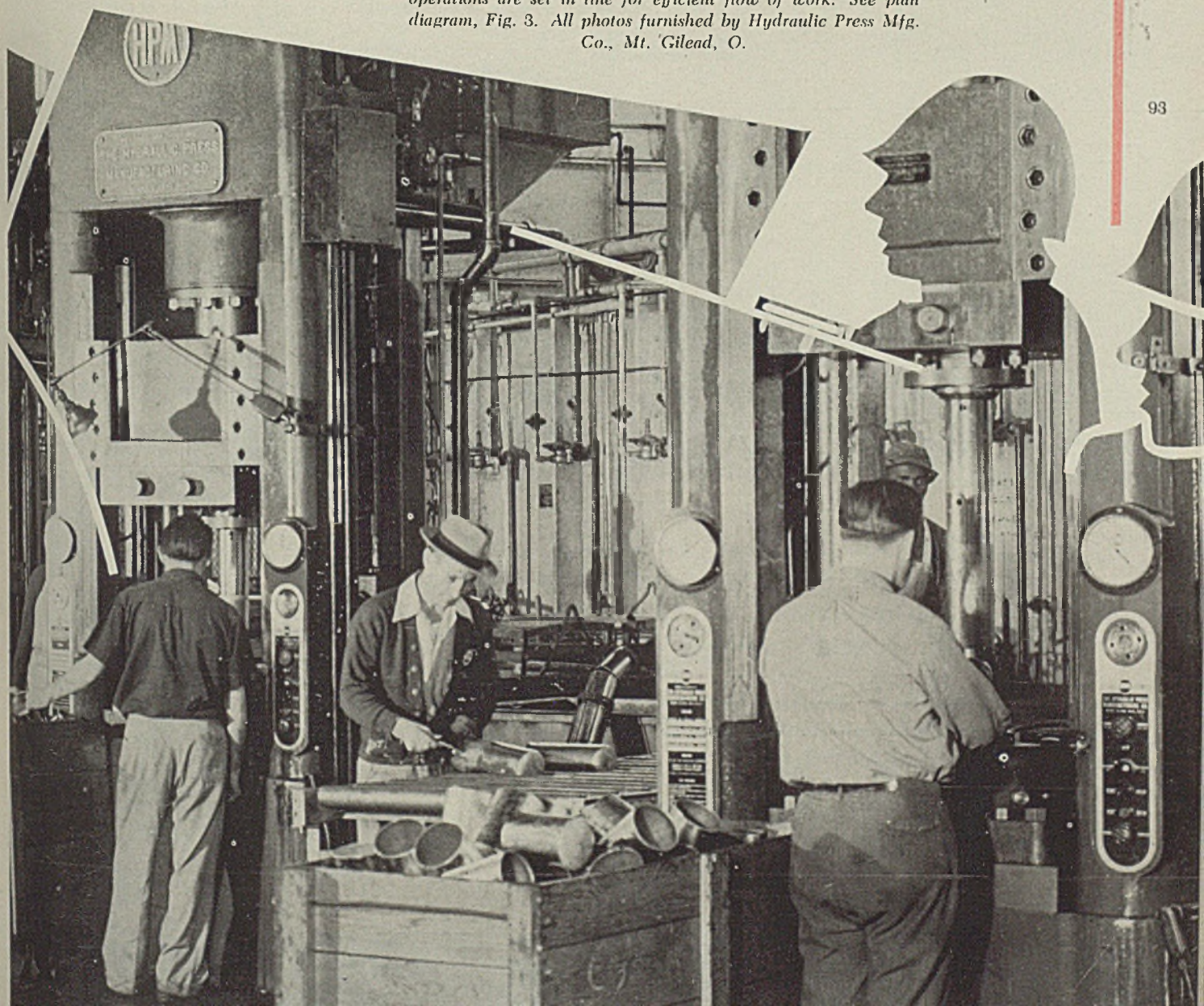
However, early in the defense program the Hydraulic Press Mfg. Co., Mt. Gilead, O., collected and tabulated all information available concerning the manufacture of cartridge cases with the assistance of Frankford Arsenal and the Cleveland District Ordnance Office of the War Department. The results of these studies and tabulations showed that, by careful selection of tonnages, it would be possible to meet all requirements with six pressure capacities and four standard press openings.

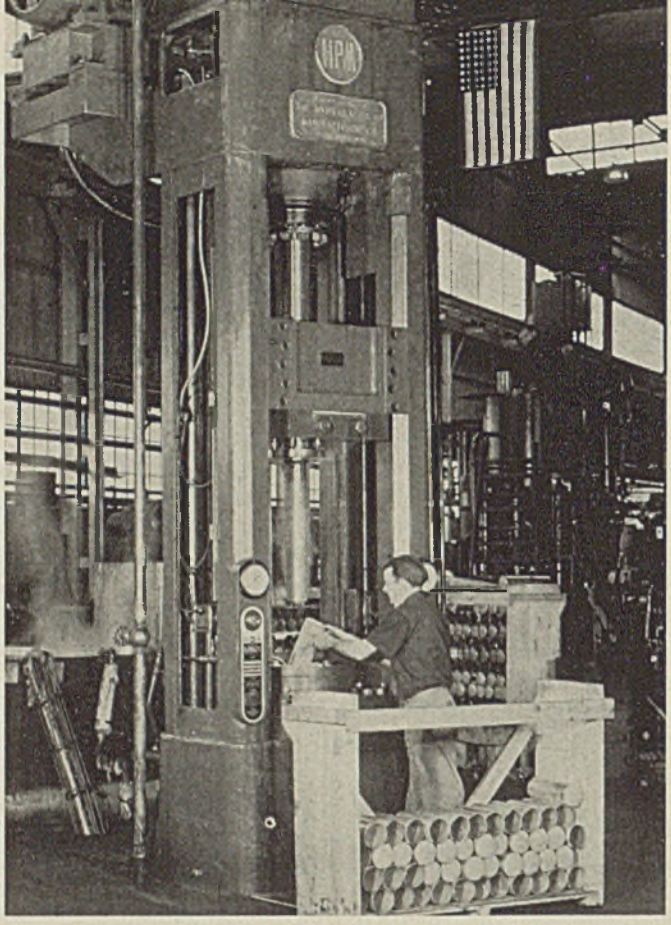
Therefore, it has been possible to engineer a standard line of H-P-M presses which could be built for stock or released for production immediately on receipt of an order without waiting for engineering or patterns.

This valuable standardization was materially aided by one of the important characteristics of the hydraulic press; that is, any part of the stroke and only as much as it actually required need be used. This can be done without loss in pressure capacity, speed, or operating efficiency. This characteristic is limited to hydraulic presses.

Press operation is semi-automatic, with two-hand pushbutton starting for each press cycle. Full automatic control is provided and can be used if desired; for example—with dial-type feed. When operating

Fig. 1—Battery of hydraulic presses for multiple deep drawing operations are set in line for efficient flow of work. See plan diagram, Fig. 3. All photos furnished by Hydraulic Press Mfg. Co., Mt. Gilead, O.





with semi-automatic control, each case automatically centers itself in the die and loading consists only of enough time to drop the case into the die and start the press cycle. Drawing compound is automatically sprayed on the cases by a coolant pump. Both position and pressure reversals are provided. Position reversal at any desired position is used for the drawing operations; pressure reversal at any desired tonnage is employed on the tapering operation.

Press speed is an important factor in drawing cartridge cases. Usually, hydraulic presses are considered slow, but modern H-P-M cartridge case drawing and tapering presses close at a rate of 900 to 1200 inches per minute and actually draw metal at speeds up to 400 inches per minute. An adjustable slowdown reduces the closing speed just before the punch contacts the case. This control eliminates shock to work, dies and press which would result if the punch contacted the case at press closing speed.

Fig. 2. (Left)—Hydraulic press drawing cartridge cases for artillery shell. Note the cage type conveyor coming up through floor just back of press. Cases are discharged into this conveyor which automatically delivers them to cleaning tank, entirely eliminating manual handling at this point

Fig. 3—Plan diagram showing flow of work through the repeated drawing, cleaning, annealing, pickling and redrawing operations as well as subsequent trim, head, taper and other steps in production of the finished case

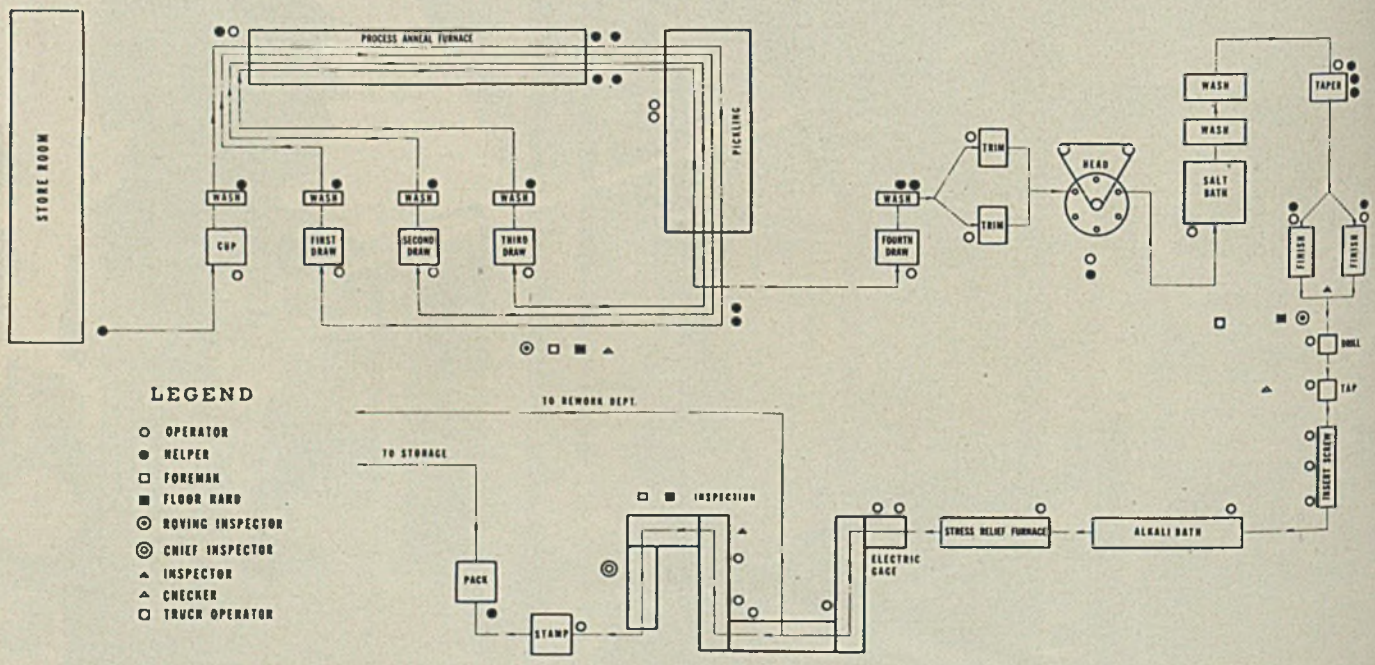


TABLE I—Operations and Press Data for Making M-14 105-Millimeter Howitzer Brass Cartridge Case

Operation	Approx. Length, Inches	Approx. O.D., Inches	Tons Req'd	Punch Travel, Inches	Rated Press Tonnage	Maximum Daylight, Inches	Maximum Travel, Inches	Speeds—Ins./Min. Close	Press	Open	Motor Horsepower
Cup	2 3/8	5 5/16	140	12	250	36	24	900	109	900	100
1st Draw	4 1/16	4 1/8	75	12	200	36	24	835	143	835	100
2nd Draw	6 1/16	4 5/8	50	18	150	48	36	830	194	830	100
3rd Draw	11 1/2	4 1/2	20	27	100	84	72	880	280	880	100
4th Draw	18 9/16	4 9/16	20	40	75	84	72	1200	390	1200	100
Taper			35	17	50	84	72	1130	300	1130	40

Note: All pressing surfaces were 30 x 30 inches.

USE THE *RIGHT* LATHE FOR EVERY JOB

MOTION PICTURES ON LATHE WORK

Two new 16 mm sound films in full color are available on a free loan basis for lathe apprentice training in the war industries.

Professionally filmed in our own factory under the direct supervision of competent lathe operators, these pictures clearly show the basic principles of engine lathe operation.

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Time, material and manpower can be saved for vital work if you use the *right* lathe for every job. The matching of the job and the lathe has never been more important than today—in no other way can maximum production be obtained. There is no place in our war production effort for slow, obsolete machines of questionable accuracy.

This is proved every day in hundreds of war plants where competent engineers have matched jobs with South Bend Lathes. Their speed, accuracy and ease of operation increase output, hold close tolerances, and conserve manpower for more efficient production.

There is a South Bend Lathe for practically every class of machine work. Toolroom Lathes and Engine Lathes are built in four sizes: 9″, 10″, 13″, and 16″ swings. South Bend Turret Lathes are built in three sizes: No. 2-H, Series 900, and Series 1000. A wide selection of attachments, accessories and tools are available for special classes of work. Write for information, specifying size and type of lathe in which you are interested.

ARMY E NAVY

SOUTH BEND LATHE WORKS

SOUTH BEND, INDIANA — LATHE BUILDERS FOR 36 YEARS

Westinghouse Strives To Harness All Horsepower

In a drive to get more war production out of electric motors and at the same time save up to 40 per cent of the copper, steel and aluminum used in their manufacture, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., recently made six recommendations in its "calling-all-horsepower" campaign.

The recommendations are:

1. Motors open to the air should be overloaded 25 per cent above their nameplate rating unless surrounding temperature is exceptionally high. Enclosed motors can be overloaded 10 per cent and direct-current open motors 15 per cent under the same conditions.

2. Most plants using small motors have 220 or 440-volt power supplies. WPB has asked that 440 volts be used because this reduces the amount of copper required in leads and control apparatus.

3. Use standard sealed sleeve-bearing motors unless ball-bearing motors are absolutely essential.

4. Use motors of highest practical standard speed and avoid use of multi-speed motors. Faster motors are smaller and require less critical materials to build.

5. Use alternating-current motors in preference to direct-current types wherever possible. This saves substantial amounts of copper and helps alleviate a shortage of direct-current motor manufacturing capacity.

6. Match control and circuit protective equipment to the motor on the basis of nameplate horsepower rating.

According to Westinghouse, 36 pounds of materials are conserved by using a motor rated at one horsepower, instead of 1½-horsepower, for a 1¼-horsepower load—sixty-three pounds by using a motor rated at 5-horsepower for a 6¼-horsepower load—five hundred and fifty pounds when a motor rated at 100-horsepower is used for a 125-horsepower maximum load. The program calls for close teamwork between industry and Westinghouse engineers to determine exact horsepower needed by each machine that is to be driven.

NE Alloy Steels

(*Continued from Page* 90)

in the annealed and tempered state was almost identical with that of SAE 4150. Hardness "as quenched" in ½ to 2-inch sections ranged from 2.5 to 2.6 millimeters brinell.

The following hardnesses were obtained after one hour at tempering temperatures:

700° F.	47-48 rockwell C
820° F.	41-44 rockwell C
900° F.	3.1-3.2 mm. brinell
1140° F.	3.65-3.7 mm. brinell

In conclusion, it should be pointed out that the cumulative effect of proper percentage of small additions of alloys enhances steel by heat treatment to such an extent that at least half of the alloy content formerly used under the old SAE compositions could be saved.

Latest Listing of

NE (National Emergency) ALLOY STEELS

THIS listing, revised as of Sept. 22, 1942, supersedes that published in Aug. 31 issue of STEEL, p. 81. It appears to differ only in that NE 8740 has been added. The compositions listed below have been selected in an attempt to provide an alternate steel for all the standard constructional alloy steels in use. These compositions comprise both the NE steels as well as certain standard steel compositions which do not require excessive quantities of strategic alloying elements. For convenience of reference and immediate identification, these standard steel compositions have also been given the NE prefix. The compositions given are subject to check analysis and apply to sections less than 10 x 10 inches.

CARBON-MANGANESE STEELS

	C	Mn	Si
NE 1330	0.28/0.33	1.60/1.90	0.20/0.35
NE 1335	0.33/0.38	1.60/1.90	0.20/0.35
NE 1340	0.38/0.43	1.60/1.90	0.20/0.35
NE 1345	0.43/0.48	1.60/1.90	0.20/0.35
NE 1350	0.48/0.53	1.60/1.90	0.20/0.35

MANGANESE-MOLYBDENUM STEELS

	C	Mn	Si	Mo
NE 8020	0.18/0.23	1.00/1.30	0.20/0.35	0.10/0.20
NE 8022	0.20/0.25	1.00/1.30	0.20/0.35	0.10/0.20
NE 8339	0.37/0.42	1.30/1.60	0.20/0.35	0.20/0.30
NE 8442*	0.40/0.45	1.30/1.60	0.20/0.35	0.30/0.40

NICKEL-CHROMIUM-MOLYBDENUM STEELS

	C	Mn	Si	Cr	Ni	Mo
NE 8613	0.12/0.17	0.70/0.90	0.20/0.35	0.40/0.60	0.40/0.60	0.15/0.25
NE 8615	0.13/0.18	0.70/0.90	0.20/0.35	0.40/0.60	0.40/0.60	0.15/0.25
NE 8617	0.15/0.20	0.70/0.90	0.20/0.35	0.40/0.60	0.40/0.60	0.15/0.25
NE 8620	0.18/0.23	0.70/0.90	0.20/0.35	0.40/0.60	0.40/0.60	0.15/0.25
NE 8630	0.28/0.33	0.70/0.90	0.20/0.35	0.40/0.60	0.40/0.60	0.15/0.25
NE 8715	0.13/0.18	0.70/0.90	0.20/0.35	0.40/0.60	0.40/0.60	0.20/0.30
NE 8720	0.18/0.23	0.70/0.90	0.20/0.35	0.40/0.60	0.40/0.60	0.20/0.30
NE 8722	0.20/0.25	0.70/0.90	0.20/0.35	0.40/0.60	0.40/0.60	0.20/0.30
NE 8735	0.33/0.38	0.75/1.00	0.20/0.35	0.40/0.60	0.40/0.60	0.20/0.30
NE 8739	0.35/0.40	0.75/1.00	0.20/0.35	0.40/0.60	0.40/0.60	0.20/0.30
NE 8740	0.38/0.43	0.75/1.00	0.20/0.35	0.40/0.60	0.40/0.60	0.20/0.30
NE 8744	0.40/0.45	0.75/1.00	0.20/0.35	0.40/0.60	0.40/0.60	0.20/0.30
NE 8749	0.45/0.50	0.75/1.00	0.20/0.35	0.40/0.60	0.40/0.60	0.20/0.30
NE 8949*	0.45/0.50	1.00/1.30	0.20/0.35	0.40/0.60	0.40/0.60	0.30/0.40

SILICON-MANGANESE AND SILICON-MANGANESE-CHROMIUM STEELS

	C	Mn	Si	Cr
NE 9255	0.50/0.60	0.70/0.95	1.80/2.20	.....
NE 9260	0.55/0.65	0.75/1.00	1.80/2.20	.....
NE 9262	0.55/0.65	0.75/1.00	1.80/2.20	0.20/0.40

MANGANESE-SILICON-CHROMIUM-NICKEL-MOLYBDENUM STEELS

	C	Mn	Si	Cr	Ni	Mo
NE 9415	0.13/0.18	0.80/1.10	0.40/0.60	0.20/0.40	0.20/0.40	0.08/0.15
NE 9420	0.18/0.23	0.80/1.10	0.40/0.60	0.20/0.40	0.20/0.40	0.08/0.15
NE 9422	0.20/0.25	0.80/1.10	0.40/0.60	0.20/0.40	0.20/0.40	0.08/0.15
NE 9430	0.28/0.33	0.90/1.20	0.40/0.60	0.20/0.40	0.20/0.40	0.08/0.15
NE 9435	0.33/0.38	0.90/1.20	0.40/0.60	0.20/0.40	0.20/0.40	0.08/0.15
NE 9437	0.35/0.40	0.90/1.20	0.40/0.60	0.20/0.40	0.20/0.40	0.08/0.15
NE 9440	0.38/0.43	0.90/1.20	0.40/0.60	0.20/0.40	0.20/0.40	0.08/0.15
NE 9442	0.40/0.45	1.00/1.30	0.40/0.60	0.20/0.40	0.20/0.40	0.08/0.15
NE 9445	0.43/0.48	1.00/1.30	0.40/0.60	0.20/0.40	0.20/0.40	0.08/0.15
NE 9450	0.48/0.53	1.20/1.50	0.40/0.60	0.20/0.40	0.20/0.40	0.08/0.15
NE 9537*	0.35/0.40	1.20/1.50	0.40/0.60	0.40/0.60	0.40/0.60	0.15/0.25
NE 9540*	0.38/0.43	1.20/1.50	0.40/0.60	0.40/0.60	0.40/0.60	0.15/0.25
NE 9542*	0.40/0.45	1.20/1.50	0.40/0.60	0.40/0.60	0.40/0.60	0.15/0.25
NE 9550*	0.48/0.53	1.20/1.50	0.40/0.60	0.40/0.60	0.40/0.60	0.15/0.25

MANGANESE-SILICON-CHROMIUM STEELS

	C	Mn	Si	Cr
NE 9630	0.28/0.33	1.20/1.50	0.40/0.60	0.40/0.60
NE 9635	0.33/0.38	1.20/1.50	0.40/0.60	0.40/0.60
NE 9637	0.35/0.40	1.20/1.50	0.40/0.60	0.40/0.60
NE 9640	0.38/0.43	1.20/1.50	0.40/0.60	0.40/0.60
NE 9642	0.40/0.45	1.30/1.60	0.40/0.60	0.40/0.60
NE 9645	0.43/0.48	1.30/1.60	0.40/0.60	0.40/0.60
NE 9650	0.48/0.53	1.30/1.60	0.40/0.60	0.40/0.60

CARBON-CHROMIUM STEELS

	C	Mn	Si	Cr	Ni	Mo
NE 52100A	0.95/1.10	0.25/0.45	0.20/0.35	1.30/1.60	0.35 Mx.	0.08 Mx.
NE 52100B	0.95/1.10	0.25/0.45	0.20/0.35	0.90/1.15	0.35 Mx.	0.08 Mx.
NE 52100C	0.95/1.10	0.25/0.45	0.20/0.35	0.40/0.60	0.35 Mx.	0.08 Mx.

*Recommended for large sections only.

HOW GOOD A SCRAPPER ARE YOU ?

How about taking *another* sock at the Axis—aside from the healthy punches you're delivering with war production? Round up all the iron and steel that it's not absolutely essential to keep. Do it both at the plant and at home. Then turn it in for scrap, even if some of it hurts!

In plain words, here's the picture. Steel producers are going to need several million *more* tons of scrap this year than ever before. If we don't get it, you won't get enough *new* steel; and if you're pinched, it's the boys on the fronts who will suffer. • It can be either a vicious or victorious circle. *Will you do your share—and more—to make it the latter?*

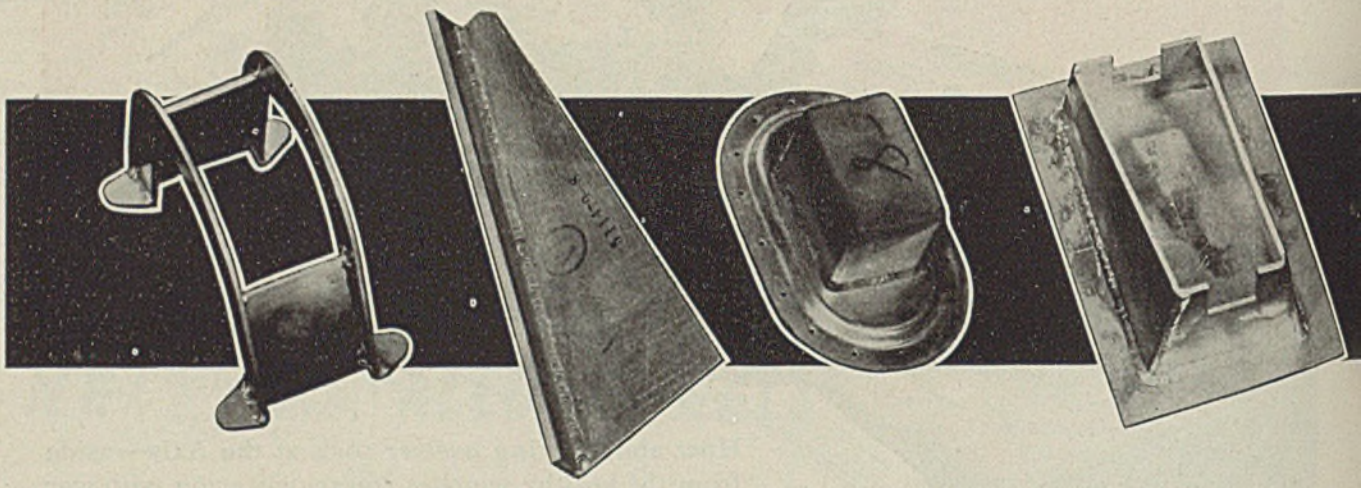
AL

STEEL FOR THE NATION'S WELFARE

Allegheny Ludlum
STEEL CORPORATION
GENERAL OFFICES: PITTSBURGH, PENNSYLVANIA

magnesium welding

. . . . is speeded by new "Heliarc" process



CULMINATING research over a two year period, Northrop Aircraft Inc., Hawthorne, Cal., is introducing and giving to the war industries Heliarc welding.

This new method of arc welding may prove a tangible weapon to speed the defeat of our enemy, for it makes possible the use of a new material for aircraft construction which lies in inexhaustible quantities off our own shores. Too, it has simplified methods of construction that will speed plane output.

This innovation has been made possible by V. H. Pavlecka, chief of research, and Russ Meredith, welding engineer, together with other men of the Northrop organization. This new development permits the arc welding of magnesium sheets, extrusions and tubing into structures simpler, lighter and stiffer than is possible in conventional duralumin construction. At the same time, methods of treating magnesium to make it less inflammable and more resistant to heat have been perfected.

The use of magnesium welded structures eliminates the hundreds of thousands of rivets that go into the conventional plane. Rivet heads on the fuselage and wings, even though countersunk, produce resistance to passage through the air, or "parasite drag." At high speeds a substantial portion of the engine power is used to overcome this parasite resistance. In the future, welded magnesium aircraft can be finished just as smoothly as a fine automobile, presenting to the airflow a perfectly uniform and rigid surface.

While magnesium has been used for some time in the aircraft industry for engine parts, wheels and accessories it has never before been used extensively as a primary construction material because of the difficulties in fabricating. Northrop "Heliarc" welding makes possible the all-magnesium plane with its many advantages.

Magnesium is the most abundant metal on the earth and in the ocean. Indeed, about 15 per cent of all the dissolved solid matter in the sea consists of magnesium chloride and magnesium sulfate—enough to cover all the land areas of the earth to a depth of 60 or 70 feet or 9,000,000,000 pounds per cubic mile. The mother liquors from the brine of salt wells are always rich both in magnesium salts and bromides. Nearly all the silicate rocks of the earth's crust contain notable quantities of magnesium. Some of these are of commercial importance; examples are talc, soapstone, and asbestos, cement, and marble.

The cost of magnesium alloys at the present time is greater than aluminum alloys. However, because of new magnesium plants under construction and increased production in the plants now in operation, magnesium alloys will be cheaper than aluminum alloys in a short time. Some 24,000 kilowatt hours are required to produce a ton of aluminum from bauxite but only 18,300 kilowatt hours are required to produce a ton of magnesium, which has 54 per cent more volume.

Magnesium alloy will shortly be the most plentiful alloy if it is not at the present time. The world's largest deposits of brusite, a magnesium bearing ore, are in Montana, Washington and British Columbia.

Contrary to popular belief, magnesium alloys are not inflammable when properly processed; in fact they are more resistant to direct flames than aluminum alloys. Although magnesium alloys are 35 per cent lighter than aluminum alloys and 21 per cent of the weight of steel per unit volume, their weight-strength ratio is comparable to aluminum alloys. And they possess the design property of stiffness and rigidity that cannot be obtained in other alloys.

Fig. 1. (Below, left)—Typical assemblies of magnesium sections produced by Heliarc welding

Fig. 2. (Right)—Operator welding magnesium by the Heliarc process

With these properties of magnesium alloys in mind, together with the rapid production method of attachment and aerodynamic advantages which Heliarc welding presents, the future use of magnesium alloys for the fabrication of structures, especially in aircraft, should be greatly enhanced.

Magnesium castings containing foundry defects have been repaired with this process and welds equal to or stronger than the surrounding metal have been obtained. The weld metal is much more dense than that of the surrounding cast metal and far less susceptible to corrosion. Almost any thickness of cast metal that can be poured may be readily welded with this process.

Welding rod of the same alloy as the parent metal is usually used for castings and wrought alloys. The weld ingot appears to have better corrosion-resistant properties than the parent metal in salt spray tests. The weld bead appears to be cathodic to the adjoining metal, which causes minor pitting of the original metal adjacent to the weld under severely corrosive conditions.

The tungsten electrode is slowly alloyed with the weld metal. Naturally in a period of time the tungsten electrode must be replaced. No noticeable increase in the corrosion rate of Heliarc welds in magnesium alloys because of the presence of tungsten has been noticed.

Heliarc weld ingots have in general an extremely fine grain with practically no grain enlargement adjacent to the bead, indicating that there is a minimum of heating effects on the adjacent metal. This accounts for the very good weld efficiencies obtained on Heliarc welded alloys.

Dowmetal J-IH magnesium alloy, Heliarc welded, has approximately 95 per cent of the parent metal strength in the weld area. However, at present the design safety factor for welded dowmetal J-IH assemblies is 75 per cent of the strength of the parent metal. These strength values are based on butt welded joints. Fillet, lap, edge, or corner welds are weaker than the butt welded joints and must be stressed accordingly.

Heliarc welding has proved to be a successful medium of attachment for magnesium, stainless steel, brass, inconel, monel, and some of the carbon steel alloys. Research work is now in progress to extend its use to aluminum and other carbon steel alloys not heretofore Heliarc welded. In the Heliarc welding process, a shield of helium gas envelops the molten metal. Because helium gas is an inert gas, it prevents oxidation and eliminates the use of a flux and the danger of entrapped flux in the weld ingot that would promote corrosion. The arc in this process is produced directly between a tungsten electrode and the base metal rather than between two tungsten electrodes as is the practice in atomic hydrogn welding.

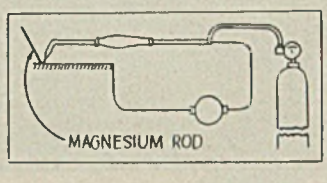
The Northrop Heliarc welding torch is equipped with a helium valve that is opened just prior to the striking of the arc between the tungsten and the parent metal which feeds helium through the torch to the weld. Helium has over five times the specific heat of air and when in motion prevents heat accumulation around the weld, thereby keeping it cooler as well as giving better fusion and penetration with less distortion than other welding processes. The arc is struck by a light brushing action and quickly drawn back from the metal. Northrop Aircraft Inc. has designed Heliarc torches which will shortly be available to the industry.

The torches are of two sizes to handle 1/16 to 1/8-inch electrode and 3/16 to 1/4-inch electrode respectively. They may be supplied with tips of angles

40, 60 or 90 degrees. The torch may be used for pencil welding or, by extending the handle, a handle bar grip is obtained for heavier welding. A type of torch will later be available that feeds the filler rod automatically, giving more uniform results than where the rod is fed by hand.

Best results are obtained by feeding the filler rod into the tungsten electrode which melts off portions of the rod thereby casting a uniform weld ingot. The procedure has been found to be superior to the practice of feeding the filler rod into the molten pool under the arc, as in this case the molten pool is not sufficiently agitated to break the crust which gathers on the surface of the pool.

Since the reflected heat from the tungsten overheats the filler rod, an angle of 60 to 90 degrees must be maintained between the filler rod and the electrode. The tungsten electrode varies in size from 1/16 to 1/4-inch depending upon the thickness of metal welded and the heat required.



The torch must be held as near the weld as possible to obtain maximum benefit from the helium for the prevention of oxidation. Also an arc length of 0.060-inch maximum should be maintained. Poor penetration or gas holes may result by using too long an arc. On those alloys that have a tendency to be hot short, a rapid welding speed at approximately 3 feet per minute is recommended to eliminate the danger of cracking.

A conventional arc welding machine with direct-current generator having a 150-ampere output is desirable. However, higher 300-ampere machines may be used providing lower currents may be obtained. An upright machine is preferable in that it is easier to attach a helium tank to such a unit. Separate current and voltage regulators must be provided, and the machines should have a continuous sequence of five increments of current control.

The average life of a 200-cubic foot helium tank is about 35 hours of continuous welding with a medium-sized torch. Fairly pure helium gas is required. Normally helium as purchased from the government plant is sufficiently pure to cause no difficulty.

Additional gases in helium such as carbon dioxide, hydrogen, nitrogen and the hydrocarbons may cause pronounced defects. Hydrogen produces bad porosity. Oxygen films the metal, causing poor coalescence and inclusions. The presence of 7 per cent nitrogen in the helium reduces the welding speed to about two-thirds that obtained when only 2 per cent is present. All of these gases if present, may be removed, however, by passing the helium through filtering mediums.

This method of arc welding has provided an important new tool for the fabrication of structures from alloys such as magnesium and stainless steel. Any type of joint which has been commonly used for welding ferrous metals may be employed on magnesium and stainless steel.

Stainless steel has heretofore been the most difficult alloy to weld and could only be satisfactorily arc welded by the use of atomic hydrogen, and then only on thicker sections. By the Heliarc welding process, thicknesses of less than 0.010-inch may be easily welded. In Heliarc welding of stabilized stainless

(*Please turn to Page* 115)

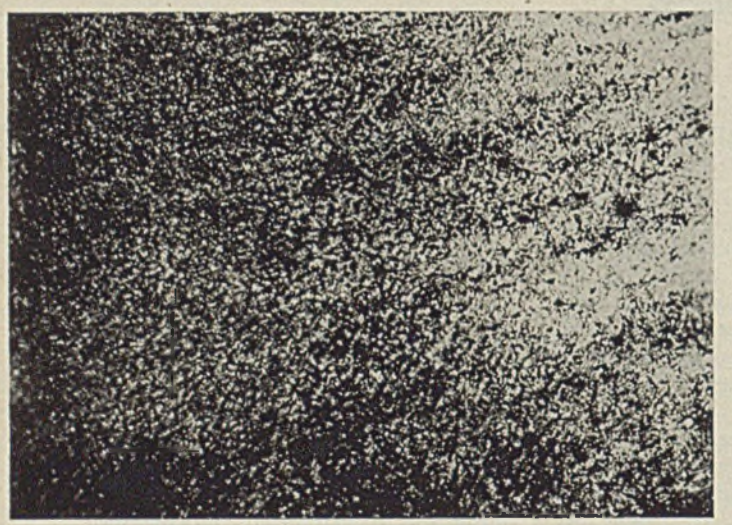
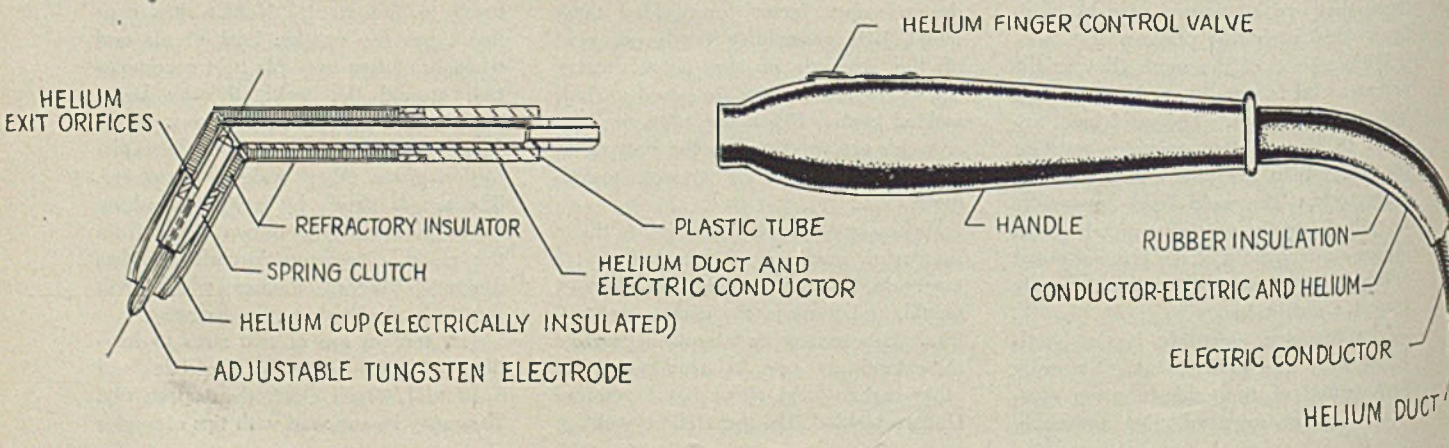


Fig. 3. (*Top, left*)—*Diagram of Heliarc welding circuit. All illustrations from Northrop Aircraft Inc., Hawthorne, Calif.*

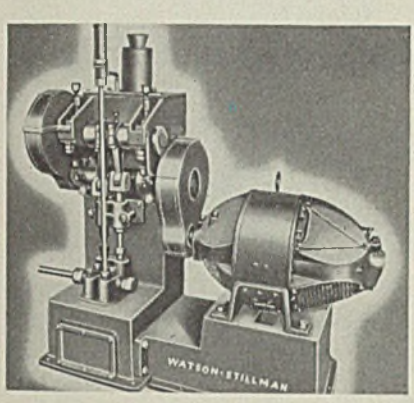
Fig. 4. (*Immediate left*)—*Microphotograph showing grain structure of weld in magnesium at* 500 *diameters. Acetic acid etch shows weld fusion or blending characteristics of weld ingot* (*dark portion*) *of Dowmetal "J" alloy rod blended with parent metal of same material* (*lighter portion*)

Fig. 5. (*Below*)—*Cross section showing details of the special torch utilized in the Heliarc process of welding magnesium. Note tungsten electrode is employed*



Starting Pump

Watson-Stillman Co., Roselle, N. J., is offering a new motor-driven starting pump for high pressures. It may be used with many kinds of equipment in-



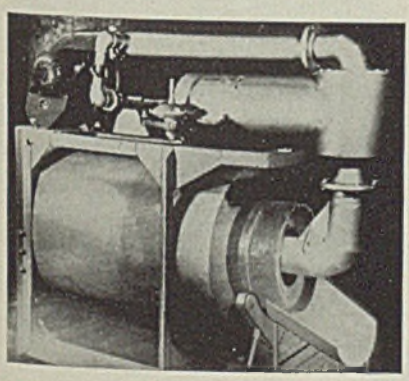
cluding marine diesel engines as well as stationary diesel engines in power plants and water works.

The pump is a 2-plunger vertical unit. Its ¾-inch diameter plungers have a 1½-inch stroke. Powered by a 2-horsepower motor driving at 720 revolutions per minute, it develops 4000 pounds per square inch. The pump delivers 130 cubic inches per minute at a pump speed of 100 revolutions per minute.

Drying Mechanisms

Salem Engineering Co., Salem, O., announces a special Salix quenching and drying mechanism for use with its large annealing furnaces. Materials may be charged into it by means of individual feeder equipment, or the dryer may be used with a continuous line of other equipment.

Materials are conveyed through the



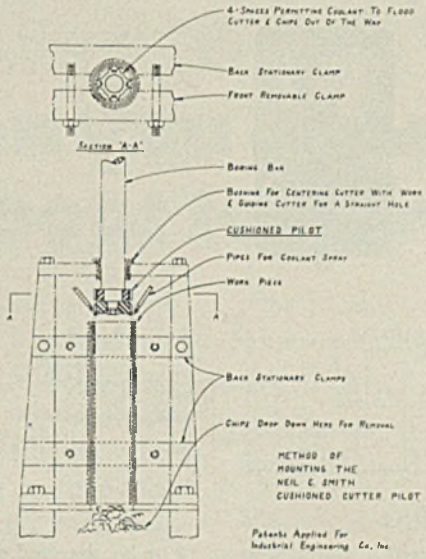
dryer by means of an internal spiral screw which deposits them at the opposite end from which they are received. The materials are tumbled as they are dried.

Capacity for small steel parts runs up to 9500 pounds per hour. Drying is accomplished by hot air blown into the interior of the perforated drying drum, and the hot air coming in direct contact with the parts as they are passing through. The dryer is offered complete with automatic temperature control, variable speed drive, etc. It may be designed and built for a wide range of products where temperature requirements approximate 400 degrees Fahr.

Cutter Pilot

Industrial Engineering Co. Inc., Board of Trade building, Chicago, announces development of a cushioned cutter pilot which is used in connection with high-speed boring of deep holes. It is said to reduce breakage of carbide tools.

This method of boring is reported to make a very rigid set-up, and make it possible to use a boring bar almost as



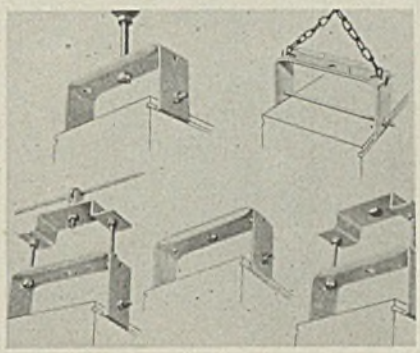
large as the bore itself. It also keeps to a minimum radial variations when under heavy load boring long, deep holes.

Lower sketch shows the cushioned cutter pilot. It is supported by a bushing in a fixture attached to the machine. The bushing guides the bar and cutter as it proceeds into the work. The cutter will work on the single tool as well as any number of tools in a cutter.

The cushioned pilot can be made to suit existing conditions for new bars, or old bars may be adapted by turning down sufficient material back of the cutter to accommodate pilot as shown in sketch. This is another important feature in that existing equipment can be used simply by turning down the end of the bars to suit. According to the company, it is possible for a manufacturer to change over at a minimum cost using existing machinery, in this way adapting the development for war work.

Fluorescent Fixtures

Sylvania Electric Products Inc., Ipswich, Mass., announces that all its continuous-row industrial fluorescent fix-



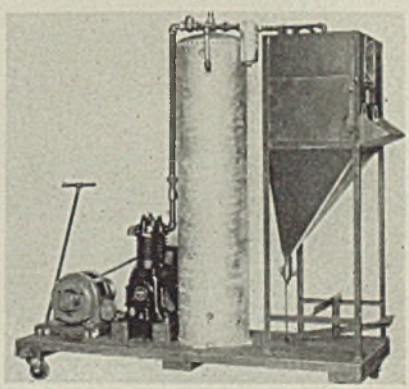
tures now come completely equipped with "Slide-Grip" hangers. These adaptable mounting clamps are claimed to produce faster installation and easier maintenance.

According to the company, one simply mounts the hangers first, then lifts the fixtures section by section and snaps them into place. The new device enables chain, surface, rod or messenger-cable mounting.

Sand Blasting Unit

Leiman Bros. Inc., S. W.-145 Christie street, Newark, N. J., announces development of a sand blasting machine which can be used on most materials including metals, glass, plastics, wood or any composition in articles of almost any shape or size.

Offered in a number of sizes to meet the production demands of any manu-

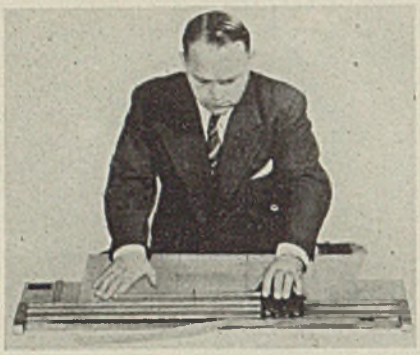


facturer, it is a self-feeding unit in which a small quantity of abrasive may be placed and used over and over again continuously. Being self-contained and mounted on wheels, the ma-

chine may be moved from one department to another.

Trimming Machine

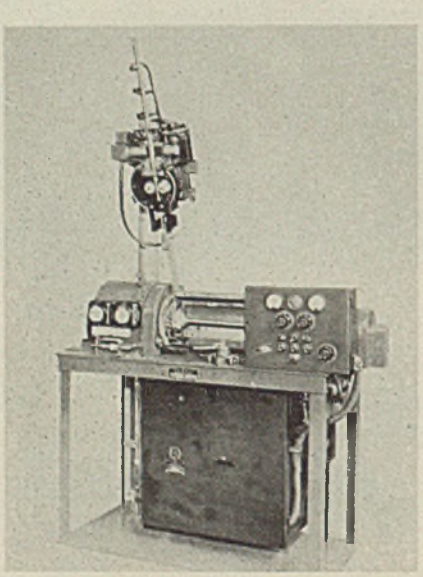
Edi Trimming Machines, 609 West 115 street, New York, announces a new Edi trimming machine for cutting blue



prints speedily and accurately. It is said to cut plans of all sizes and many thicknesses, and makes a clean, rectilineal and square cut. The machine sets margins automatically from ⅜ to 2 inches. It is being offered in four sizes —32, 38, 50 and 62 inches.

Welding Equipment

General Electric Co., Schenectady, N. Y., announces complete equipment for automatic arc welding with heavily coated electrodes in cut lengths. It is particularly suited to work where one or more complete joints can be made with a single electrode, such as in the welding of shells, wheels, and tubular



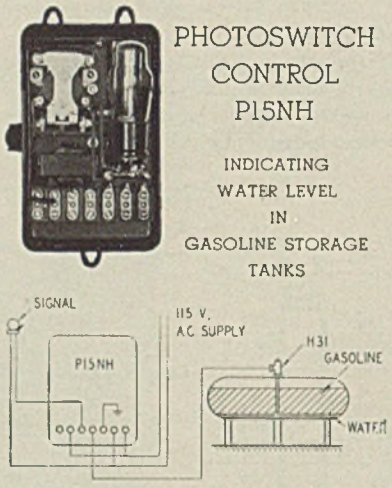
assemblies where the starting and finishing ends of a single weld bead over-lap.

Equipment is similar to that used for welding with coiled electrodes except for the electrode feed rolls and electrode guiding device. The mechanism includes a clamp for holding any standard stick electrode, and for transmitting current to the electrode.

The clamp is attached to the end of a feed rod upon which two feed rolls operate to maintain proper voltage through automatic thyratron control. The electrode is accurately guided to maintain the arc in a predetermined location. Limit switches govern the extremes of movement in either direction.

Water Detector Lock

Photoswitch Inc., 21 Chestnut street. Cambridge, Mass., announces a type P15NH electronic water detector lock to indicate water seepage in gasoline storage tanks. It is equipped with a probe fitting which projects down through the storage tank to the level at

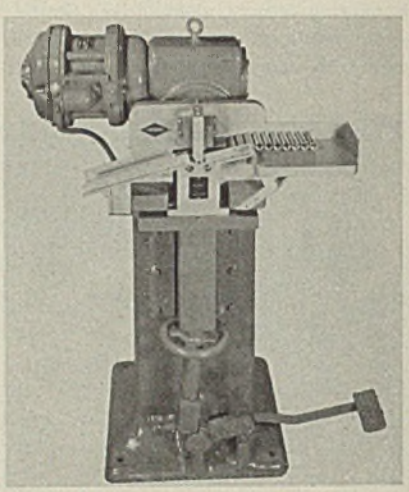


which water seepage is to be detected.

The lock itself is located at any point remote from the tank and wired to the probe. While the probe rod is entirely immersed in gasoline and so long as water seepage does not reach the probe, no signal is given. When water seepage rises to contact the probe tip, an electric circuit is completed through the water itself, and the lock operates, turning off pumping equipment and actuating an alarm. The lock operates on 115 or 230-volts alternating current. It is offered in a weather-proof, pressed-steel housing.

Knurling Machine

Wm. A. Force & Co. Inc. recently introduced a new knurling machine—one that increases the output of knurled shell. Semi-automatic, it has a production rate estimated around 1000 pieces per hour. Work is fed by hand, action of the foot treadle bringing it to the knurling roll and then ejecting upon retraction. Unit illustrated is tooled for

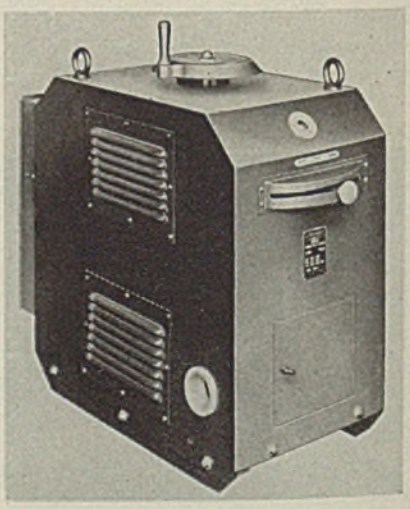


knurling 20 millimeter shell. Similar units are offered for knurling other cylindrical pieces, ranging in diameter from ¼ to 3 inches.

Heavy-Duty Welder

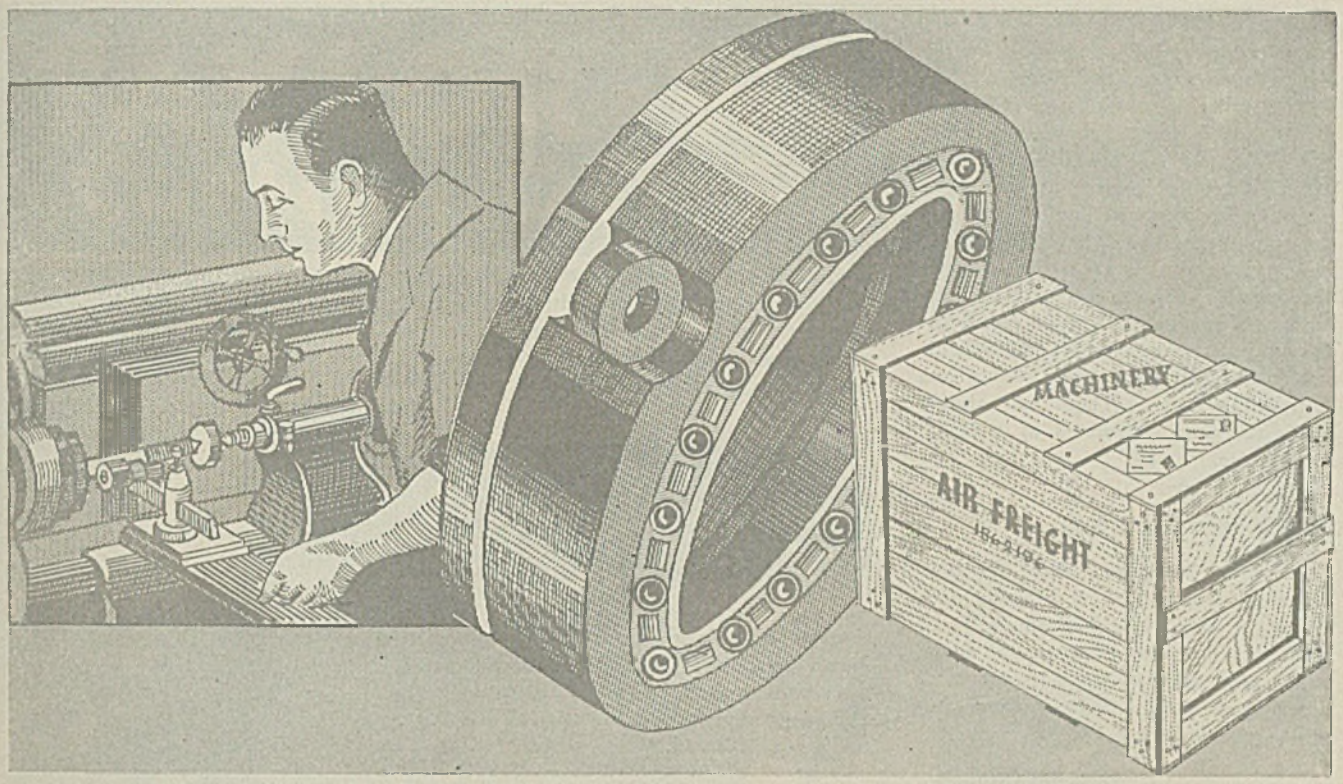
Glenn-Roberts Co., Oakland, Calif., has introduced a new model 45 heavy-duty manually-operated welder which features a welding range of 20 to 625 amperes. It is reported to be the first manual welder to offer such a wide range of heats in a single machine.

The machine is capable of handling a great variety of jobs from light sheet metal to heavy production work. It enables the operator to select the de-



sired heat from two ranges by manipulating a specially designed switch.

Low range provides heats from 20 to 200 amperes, high range from 200 to 625 amperes. Stepless heat control is maintained throughout the entire output range. The input is in direct proportion



One decision you can make today ...about tomorrow

Take a look at what we're doing today: rushing out aircraft armament; Automatic Bomb-release Racks, Cannon parts, Bomb-release Shackles and hardware for all types of military planes... all to exacting specifications... on a 24-hour, 7-day production basis... and delivering on time with the lowest percent of rejections! (And mind you, we were doing this long before Pearl Harbor.)

Now take a look at tomorrow... when the democratic peace comes and the competitive struggle for private business begins. When the buyer is going to demand better products at still lower prices, or else. Tough picture, isn't it?

The decision you can make today, about tomorrow, is to plan on using this Spriesch modern war production ability to insure your survival and leadership in the battle for business.

We shall be glad to work with you. Our business is metal fabrication, special or production work, tools, dies or parts to your order.

Plan now with us for tomorrow.

Joseph J. Cheney, President.

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and extensive facilities to produce intricate or simple designs —experimental pieces or mass production—complete assemblies or parts with maximum accuracy, minimum waste at reasonable cost.

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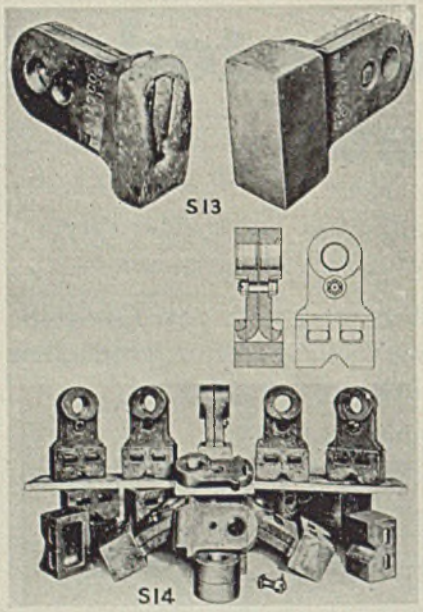
to output, thereby utilizing all energy to the fullest for productive work.

The welder is power factor corrected. Its "heart" is the transformer, utilizing the G-R principle of flux diversion which permits stepless control at all heats. Transformer primaries and secondaries are amply spaced on separate legs of the core, preventing any breakover reaching the operator. The core design and the absence of external reactors prevent welding surges. The transformer core is laminated of die-stamped plate of low-loss transformer steel. These are rigidly bolted in place, supported by a heavy steel frame.

Pulverizer Hammer

American Manganese Steel Division, American Brake Shoe & Foundry Co., Chicago Heights, Ill., is offering a 3-part pulverizer hammer featuring a design which promotes economy. It consists of a weighted manganese steel head connected to the rotor by two matching

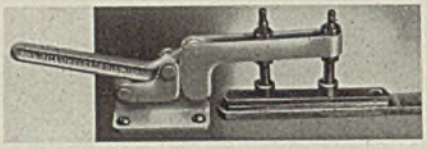


arms or bars of manganese steel. On the lower end of each bar are hooks which engage internal pockets in the head. The bars are bolted together under the eye so that they form a one-piece arm; yet they are easily disengaged from the service worn head by unbolting.

Six advantages are provided by the hammer: Great saving in weight of discarded parts; two-thirds of hammer head can actually be used up before renewing is necessary; time consumed in removing old and replacing new head is negligible; no operating stress is imposed on shank bolt used for assembling; head cannot work loose and come off arm so long as the latter is on the supporting rotor pin; and no metal is lost by too early discarding of heads as the maximum use is indicated when lower ends of arms are visible.

U-Clamp

Knu-Vise Inc., Detroit, announces a new clamp with a U-shaped toggle bar, with handle-in-line which permits simultaneous clamping of small parts regardless of thickness. Its slotted toggle bar allows free horizontal movement of the two rubber-capped spindles for their posi-



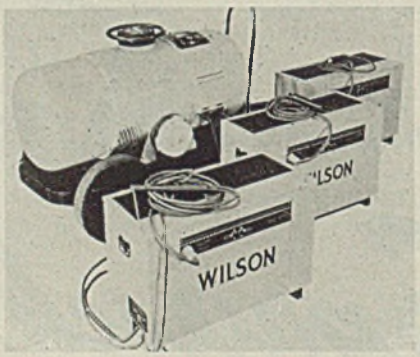
tioning over work. Once adjusted, spindles remain in their respective positions until work is completed. Repeated clampings always exert the same degree of pressure it is said.

Arc-Control Station

Wilson Welder & Metals Co., New York, announces development of a Honey Bee arc-control station said to provide better control and improved welds on thin gage metal. An auxiliary electric device, connected in series with the welding circuit of any constant potential arc welding generator, it is being offered in capacities of 75 and 150 amperes.

According to the company, when two or more arc-control stations are hooked up to a single generator, a like number of welding arcs can be operated simultaneously. Each operator can regulate his own current and weld as he sees fit without affecting the other in any way.

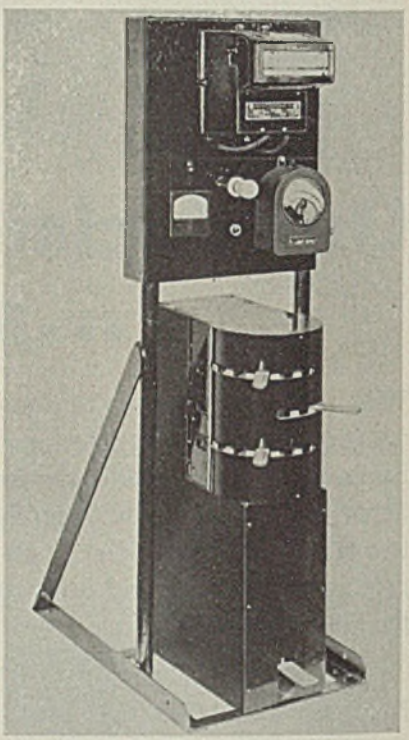
One of the important features of this new arrangement is the remote control of the arc when the operator reaches



the end of a bead. Thus an operator can: Set his control to deliver a definite current at the arc and weld steadily at that setting; or he can use the hand switch to vary the current without breaking the arc. This enables him to start his arc on cold metal with a maximum current and to reduce the current as the work warms up. With the use of two 75-ampere arc control stations, a 200 ampere generator can serve two operators instead of one.

Temperature Control

Upton Electric Furnace Division, 7450 Melville avenue, Detroit, announces a new temperature control for salt-bath heat treating which measures and adds the correct amount of power for the proper interval and even corrects the operator for any error on his part in setting the control. It is said to be not



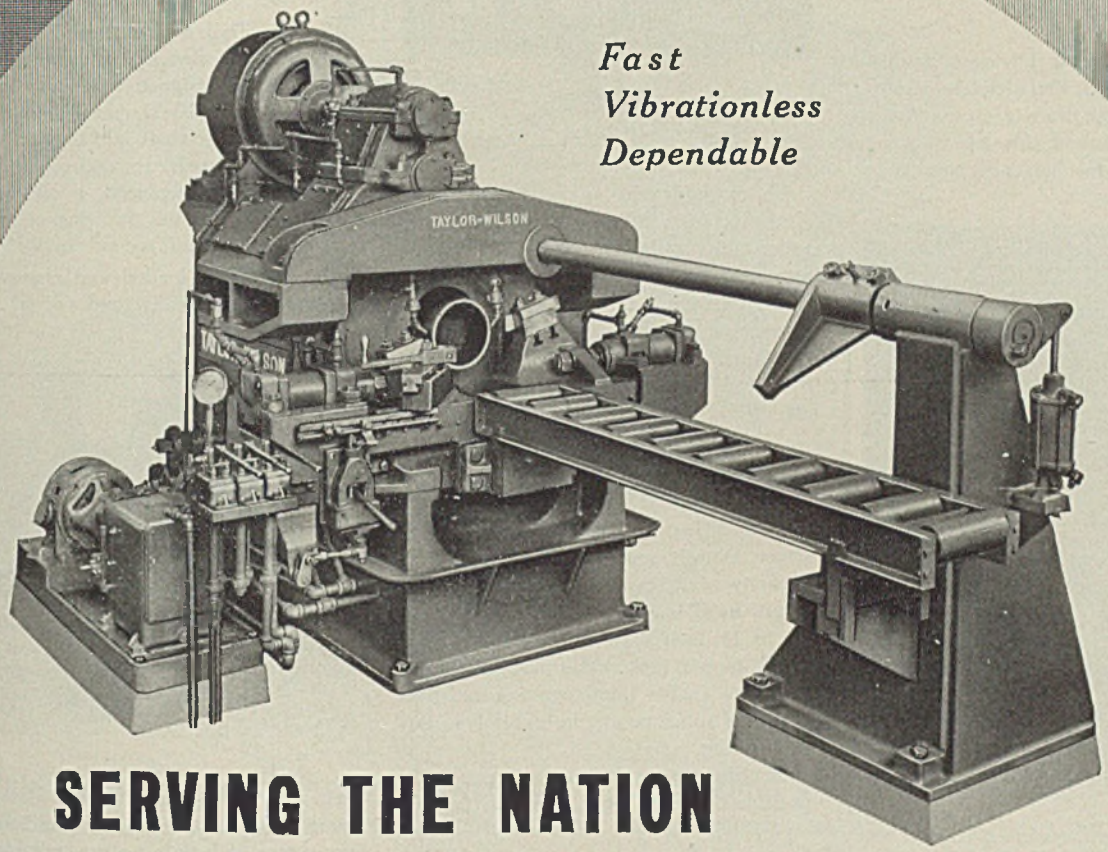
only foolproof and simple to operate, but permits prediction of size change to closer limits thereby eliminating much finish-grinding on many high-speed steel cutting tools.

The control keeps the heat on at all times, but at a low value. Then, when work is put into the bath, it adds a definite amount of heat for a specific interval. When the interval is ended, it reduces the power back to a holding level and warns the operator that the work should be removed.

Moreover, according to the company, if the operator should make as little as a 3-degree Fahr. error in his settings, the controller warns him of the mistake. Thus, no matter how little experience the operator has had, it is virtually im-

TAYLOR-WILSON
Cutting-Off Machines

Fast
Vibrationless
Dependable



SERVING THE NATION

Taylor-Wilson Machines for cutting off pipe or tubing for Bomb Blanks, Roller Bearing Blanks, Coupling Stock, etc., are making valuable time-saving contribution to industry's war production. Their accuracy is absolute and their production is limited only by the ability of the cutting tools to take it.

The tool slides are hydraulically driven permitting unlimited feeds between maximum and minimum.

Write for full information.

Sizes 1″ To 24″ Diameters

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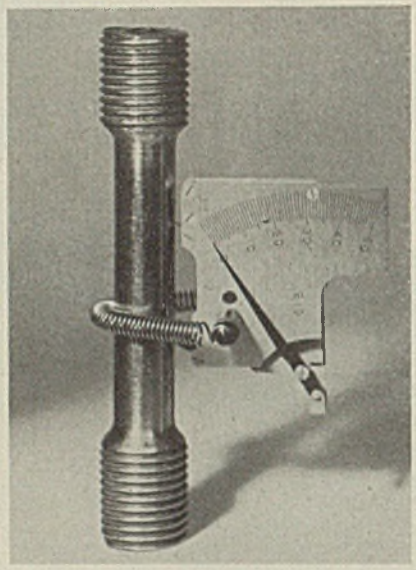
PITTSBURGH DISTRICT

possible for him to make an error that will spoil the work.

The equipment consists essentially of a panel stand on which is mounted pyrometer, timer, ammeter and signal light. Below the panel is a cabinet with three heat selector levers. A foot-operated circuit interlock "unloads" the hand-lever switches to avoid burning of their contact points when a change in heat selection is being made.

Strain Gage

Baldwin Southwark Division, Baldwin Locomotive Works, Philadelphia, is offering a Porter-Lipp strain gage, an American built instrument, for use in structural testing. A mechanical type of gage,



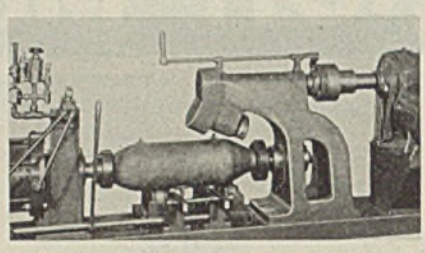
it is accurate, light, compact, rugged and convenient.

The strain multiplication factor of the gage is approximately 300, and it has a range of 0.008-inch or better. Weighing only 0.4-ounce the gage has overall dimensions of 1¾ x 2 x ⅝-inch. It is graduated so that each division corresponds to a strain of approximately 0.0001-inch and has a readable accuracy of 0.00002-inch for gage length of one inch.

Bomb Marker

Jas. H. Matthews & Co., Pittsburgh, announces a new No. 203 bomb marking machine for incorporating various data on the conical tail of various size bombs. It is said to be adapable for installation in production lines, and completes the marking noiselessly.

Semiautomatic and made in various sizes for marking 100 to 1000-pound bombs, the machine has features that provide for variations and irregularities in bomb surface to be marked, to assure complete and legible impressions. To operate, bomb is rolled into the machine in the position shown, resting on the cradle rolls. It is held in position by



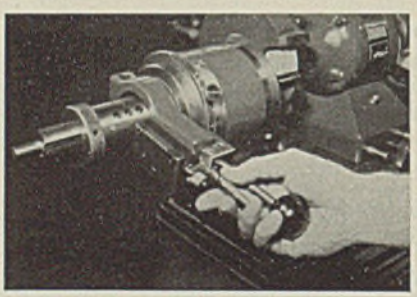
a pneumatic thrust chuck at the nose, and by a rotating thrust bearing at the tail.

To mark bombs a single revolution clutch is tripped by a hand lever. A roller die with interchangeable type rotates the bomb and progressively marks the required data, in one line of ¼-inch characters on the conical tail surface. The bomb is then raised from the cradle rolls and allowed to roll from the machine.

Tap Reconditioner

Detroit Tap & Tool Co., 8432 Butler street, Detroit, announces an increase in capacity of its tap reconditioner so that it now handles all sizes and types of taps up to 1¼-inch diameter, including long shank tapper taps. The machine is designed to enable spiral pointing and polishing of spiral points, in addition to tap chamfering.

Handling long shank taper taps is made possible by providing a "through" hole in



the tap chamfering head. The machine also includes a number of improvements to increase the ease with which taps may be reconditioned.

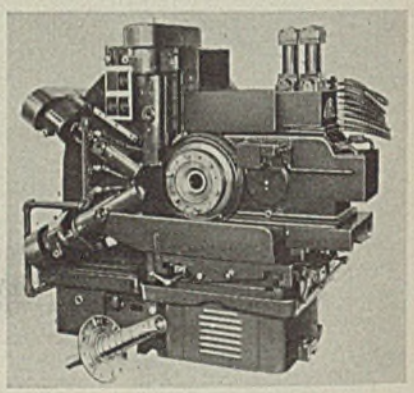
Welding Positioners

Cullen-Friestedt Co., Chicago, has introduced two new giant welding positioners—model 200 with a capacity of 20,000 pounds and model 300 with a capacity of 30,000 pounds. Like the other of the company's positioners, these are mounted on a single pedestal, which is adjustable for height. They have a table which revolves completely around and tilts to any position up to (or down to) 135 degrees off horizontal. Being motorized, units can be operated by a push-button panel so that welder can swing and tilt weldment to any position without use of cranes or handling crew.

Rotary Milling Machine

Snyder Tool & Engineering Co., Detroit, recently developed a rotary, milling machine designed to mill an undercut in the circular shoulder section of a turned propeller shaft hub to produce six elevated rest pads. Its entire processing operation, it is reported, is fully automatic except for the throwing of a lever between first and second cycles.

Workpiece is loaded and clamped in position hydraulically, and moved auto-

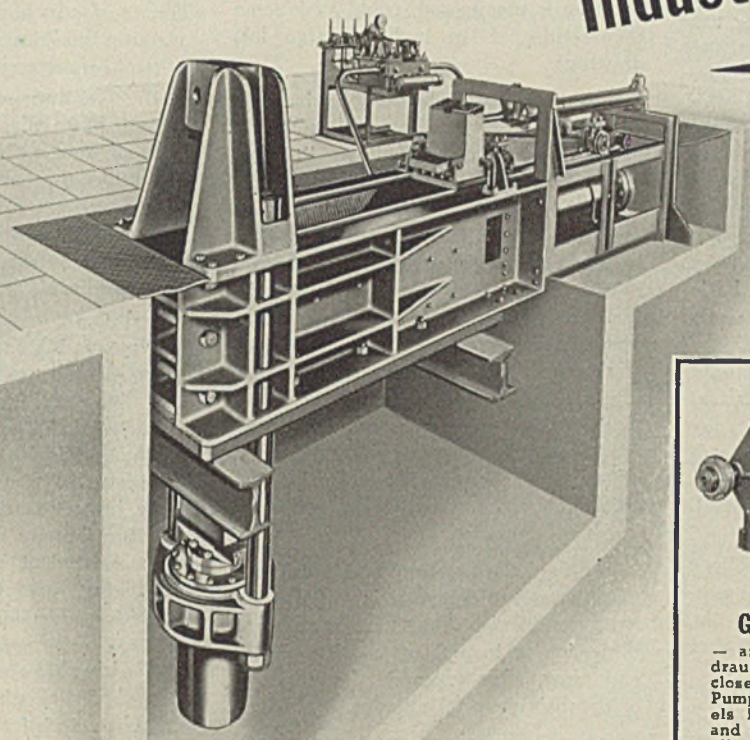


matically by hydraulic power along the main slide into milling position. A transverse sub-slide, also hydraulically operated, serves to bring the workpiece into contact with the tools and feeds it forward until the required cutting depth is reached.

Three milling spindles are embodied on the machine. The tools have tapered shanks, and, because of their small size, are supported by an outboard bearing. On completion of the first three cuts, the fixture retracts automatically and rotates the workpiece 180 degrees, into position for the second three cuts.

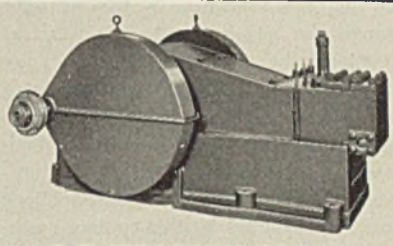
When the six rough cuts are made, the fixture again retracts and the entire fixture assembly moves along the main slide, permitting the operator to inspect cutters and finish. Throwing of a small lever starts the machine through an identical second cycle in which the finish cut is made. Indexing on the machine also is automatic and the rotation of the fixture during the milling cycle is accomplished through heavy-duty hydraulic cylinders which give an adjustable feed rate for milling.

High Volume Scrap-Metal Salvage for the Metal Working Industries



Type **MCY**

Hydraulic, Double Compression, Pit Type Baling Press for Industrial Stampings, Clippings and Non-Ferrous Scrap. Built in various sizes with capacities from 1 to 10 tons per hour. Other types and models from ¼ ton to 20 tons per hour.



G-H HYDRAULIC PUMPS

— are the "power plants" for G-H Hydraulic Balers. Illustration shows Enclosed, Single Pressure Triplex Plunger Pump, Reciprocating Type. Other models include Horizontal Double-Pressure and Vertical Single Pressure Pumps for oil or water. Sizes from 5 H.P. to 300 H.P. Also built for other applications in pressures up to 10,000 PSI.

Baled metal scrap, speedily and systematically salvaged from the production lines of industry has been a vital factor in keeping the nation's steel mills operating at top capacity. Galland-Henning Type MCY Balers, pictured above, are BIG GUNS in this Scrap-For-Victory Program — have helped to keep a steady flow of dense, compact mill-size bales moving back to the mills for quick, low-cost conversion into usable form.

If your manufacturing operations produce steel stampings and clippings or non-ferrous scrap at the rate of ¼ ton-per-hour and up, a Galland-Henning Baler of the proper size and capacity can solve your scrap disposal and salvage problems on a profitable basis.

Galland-Henning engineers offer you the benefit of over 30 years experience in working out successful salvaging programs, based on low-cost scrap-metal baling, for all types of metal working plants. Ask for their counsel — no obligation!

The Scrap-For-Victory Program Needs BALED Metal Scrap!

G-H

GALLAND-HENNING MFG. CO.

2747 SOUTH 31st STREET • MILWAUKEE, WISCONSIN

A 3827-1P

Template Making

(*Continued from Page 71*)

make best use of its remnants is bound to win, other factors being equal. To take a part from this crack-up, add another from the second, and so on to originate quickly a serviceable ship capable of swift combat is only possible when there is absolute dimensional control. This naturally depends upon the accuracy of template duplication for use in pattern making, part production, assembly, inspection, jigs and fixtures. And that is exactly what this GMC-Eastman X-radiation photographic method permits.

There are, of course, two basic methods of photographic reproduction—the optical or projection method and the contact method. The first employs a lens to project an image from the basic drawing to the template or other work. In the second or contact method, the final image is produced by passing light through the negative onto the work as it contacts the negative.

The GMC-Eastman process now being used by Boeing, Vultee and North American is a variation of the contact method, as will be explained. It is to be emphasized that offscale reproductions cannot be handled by this contact method, its application being only for the full-scale exact-size reproduction of templates.

Metal is not affected by humidity conditions, its only change in size being dependent upon its thermal coefficient of expansion, which is practically nil under normal temperature conditions. Thus, a basic drawing on metal can be expected to maintain complete fidelity of dimension when reproduced on duplicate metal plates. This fidelity might be lacking by the optical method in which the image is picked up from paper which, unless rigid control of humidity and temperature is maintained, could vary some thousandths of an inch in large loft drawings.

Certain materials become luminescent and glow visibly when exposed to X-rays. Some, in particular, continue to glow for a period of time after the X-ray excitation has ceased. The GMC-Eastman experimentation tried everything. Exhaustive tests were made with a fluorescent coating that glowed only in the presence of X-radiation, these rays being bombarded through the back of the metal drawing board carrying the face image in contact with a sensitized metal plate. However there was some degradation of white areas and the image didn't have the contrast definition desired. The fluorescent technique was, therefore discarded.

The final development makes use of a phosphorescent lacquer in which the X-ray sensitive molecules are in such fine dispersion as to pick up the X-radiation and glow, after exposure, for a period of approximately 30 minutes.

Think of the drawing paper as being metal. Either aluminum or steel is generally used. This metal is made ready for drawing by spraying it with the phosphorescent lacquer. This lacquer may then be sanded or pumiced to provide the proper tooth for the drawing pencil or pen. The master drawing is then pencilled or inked onto this coated metal from the original engineering data, just as a draftsman would draw on paper. The surfaces have identical feel and working qualities.

Using the GMC-Eastman method, this is the last and only drawing that need be made. All contact reproductions will, of course, be full size. Now let's lay aside this master drawing on the phosphorescent-coated metal for the moment and discuss the make-ready of the metal plate upon which its image is to be reproduced.

Sensitizing metal is an art as old as tintypes or daguerreotypes. The photochemical processes, such as engraving, use light-sensitive coatings on metals exclusively. The problem in template reproduction is to obtain such additional requirements from a sensitizer as complete protection of the silver salts from any metal more active chemically than silver, sufficient adhesion to withstand machining operations, proper surface tooth for any pencilled additions or corrections, ease and certainty of application and, above all, uniformity and dependability of photographic and physical characteristics.

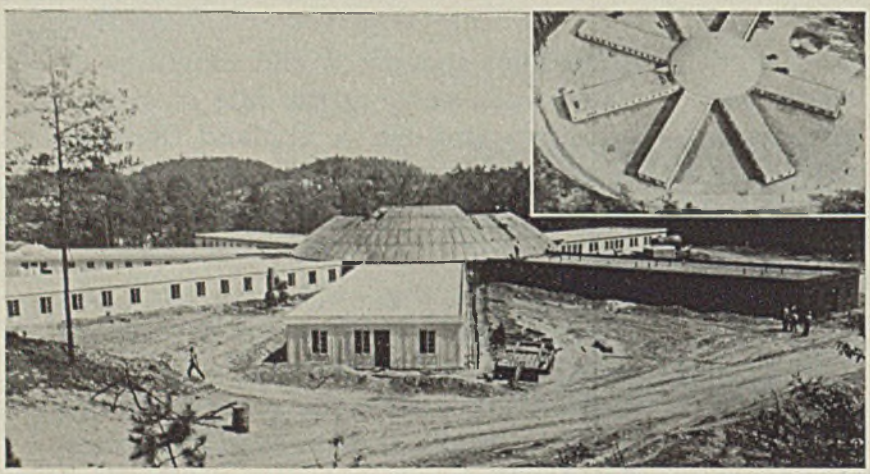
With the problem defined that sharply, Eastman found the answer in a special transfer paper, a silver emulsion skin only 0.000175-inch thick on a temporary paper support, supplied in rolls 200 feet long and any width up to 40 inches. If a material wider is to be coated, two or more strips can be laminated with a separated or butt joint.

Terneplate and aluminum are the only commonly used metals which have no injurious effect upon the processing solutions. So all other metals used for template reproduction must be coated with a clear waterproof lacquer on back and edges. This is also true of nonmetallic materials such as plywood.

The metal is given an initial primer coat of any good metal primer having no photographic effect and possessing some covering power. Eastman lacquer No. 20877 containing a white pigment is then applied to the metal. Thinned with Eastman thinner No. 2356, this lacquer can be sprayed. Several thin coats are preferable to one heavy coat.

The laminating machine is now spooled and threaded with Eastman matte transfer paper in preparation for the lamination of the transfer paper to the lacquered metal. The laminating machine, which is available commercially, is 5

ALL-WELDED STEEL HOTEL



MORE than 12 miles of welded metal was used to finish this all welded steel hotel (Canadian Lake Louis) prior to the steel demand. Built in form of an eight-pointed star—one ray cut away to allow for the front entrance—walls, roof and dome are of 12-gage mild steel plate which were pre-fabricated on the site into panel sections. Over 250 tons of steel were used for panels.

Each ray section of the hotel is 125 feet long, 32 feet wide, and 9 feet 4 inches high. The center dome is 100 feet in diameter with no control supports. It consists of regular panel sections staggered in welded rows. Roof panels are 46 inches wide, 92 inches long and 18 inches deep. Wall panels are 46 inches wide, 92 inches long, and 6 inches deep. Twenty Multi-Range arc welders supplied by Hobart Bros., Troy, O., were used on the site

feet in width and basically resembles an overgrown clothes wringer but includes shafts for carrying the transfer paper and a third roll used to apply the necessary cement (Eastman No. 20806) to effect a bond between the lacquered metal and the emulsion of the matte transfer paper. Feed and delivery tables are fitted to either side of the laminating machine. See accompanying illustrations.

The lamination then occurs. The lacquered metal is placed lacquer-side down on the feed table and pushed to the rubber laminating rolls, the bottom roll is threaded with the transfer paper, emulsion side up, from the lower stock spool.

Sensitive to Blue Light Only

Just before going through the laminating rolls, the lacquered side of the metal is given a thin layer of solvent by passing over the cement roll. This cement or solvent softens the lacquer coating on the metal. The metal and transfer paper pass through the laminating rolls. The emulsion on the transfer paper bonds to the softened lacquer. The laminated metal plate rolls over the delivery table coated with a thin layer of silver emulsion still protected by the temporary paper support.

The sensitized metal is then placed in a rack while all remaining traces of solvent evaporate. Immediately preceding exposure and processing, the temporary paper backing is stripped off leaving the emulsion alone on the lacquered metal surface.

The film emulsion is sensitive only to blue light. It can therefore be applied under ordinary safelight conditions suitable to process films. A reasonable amount of indirect light transmitted by filter will not affect the emulsion. There must be no sharp metal edges or feathers, laminating rolls must be free from lint and the temporary paper backing must be stripped off cleanly.

The speed of this transfer paper is satisfactory for contact printing or for projection work with a lens. It is matted to the extent that it takes pencil readily, an advantage when additional details such as flange lines are to be added.

Summing up the GMC-Eastman process description to this point, we have, first, a master drawing, pencilled, inked or scribed on metal, coated with a phosphorescent lacquer as yet unexposed; second, a sensitized metal plate that has been primed, lacquered, and to which a sensitized emulsion has been laminated, capable of receiving the image by contact.

Now the phosphorescent metal drawing board with its master drawing is exposed to weak X-rays. This equipment is relatively inexpensive. The General

Electric X-ray Division advises that its "citrus testing" unit is entirely satisfactory for this purpose, and it is likely that even smaller equipment will be found adequate. The exposure interval is less than 10 minutes.

When the X-ray is turned off, the lacquer continues to glow with a pale blue phosphorescence, to which the transferred emulsion is sensitive, for over 30 minutes. This becomes the "after-glow" image from which any number of prints can be made by the contact process. The fatigue point of this lacquer has not been ascertained. Approximately six contact prints can be made per charge before the drawing surface has to be re-excited by the bombardment of X-rays.

A vacuum printing frame is used to bring the sensitized metal plate and the glowing metal drawing together to receive the reproduction. The reproduction exposure interval is about 4 minutes. The glow of the lacquer exposes the photographic emulsion, the pencil or ink lines on the drawing mask the glow and permit no exposure. When the photographic material is then processed, a negative image is obtained. Concern over line sharpness or double printing while obtaining contact is unnecessary. The after-glow is of such low intensity as not noticeably to affect the emulsion except on direct and protracted contact.

If mirror images are sufficient, such negative reproductions can be treated as finished templates. However, if positive images are required so that engineering information can be referred to without use of supplementary blueprints, there is still another step in the GMC-Eastman process.

To gain positive reproductions, a master negative has to be made by contact with the glow drawing in this manner: A sheet of metal is coated with phosphorescent lacquer. The transfer paper is then laminated above this surface in the same manner as previously described. The metal sheet then consists of a lacquer which will glow only when excited with X-rays and a photographic emulsion coated over this glow lacquer. This metal negative is placed in contact with the original drawing which exposes the transfer emulsion on the metal negative. Notice that the phosphorescent lacquer under the exposed emulsion of the metal negative has not as yet been bombarded with X-rays. After processing photographically, as negative image results, overlying a lacquer coating that is capable of being made to glow. This is the finished master metal negative.

Negative Bombarded by X-Rays

The master negative is, thereafter, bombarded by X-rays to excite the phosphorescence of the underlying lacquer layer. This glowing negative is then placed in contact with regularly sensitized metal template sheets and the exposure is again made with the glow of the layer. This reverses the initial image, the negative photographic image on the master negative masks out the glow of all except the image lines; thus, after processing, becoming a positive print ready for the template makers. As many of these positive prints as desired can be made on metal, sensitized as originally described. The master negative requires re-activation after making approximately six such contact prints.

This photographic processing involves the familiar developer, rinse bath and fixing bath. Due to the thinness of the emulsion layer, it processes rapidly; developing time being from 1½ to 4 minutes, fixing time from 2 to 3 minutes.

The equipment used must naturally conform to the full-scale dimensions of the reproduction to be made. A light-tight photographic darkroom is essential to the handling of the photographic emulsions. Illumination is best accomplished with double overhead indirect safelights. Large materials should be handled in long, narrow tanks; slightly longer and deeper than the dimensions

of the largest material to be processed. They need be but 6 inches wide since the plates can well be handled on edge. Stone or crock is most suitable for these tanks. Standard vacuum frames come in dimensions up to 50 x 70 inches.

If the metal plates are large and heavy, a monorail system from the laminating room, past the processing and drying equipment, into the delivery room will greatly facilitate the procedure. Plates can be arranged for suspension from a hoist by drilling small holes at the top of the plates and using a pin-type fastener.

Simplicity, accuracy and low capital investment are advantages of this method. Its disadvantage is the inability to obtain scaled reproductions. The projection lens method is better where scale models are to be made. These are indispensable in the aircraft industry for wind tunnel and other tests. Also, scaling is often necessary to allow for shrink lines, bend lines, etc.

The use of this full scale method of contact reproduction of templates puts metal into the air in far less time than thought conceivable two years ago. The man-hours saved, for example, in the use of this template reproduction in such assemblies as fuselage, wing, contour section, welding, drill, mating jigs, is practically inconceivable. Truly, this process has made aircraft susceptible to mass production for it combines dimensional control and rapidity of accurate reproduction with absolute fidelity of image and with the ability to mask out such engineering data as is desired without resort to anything further than the original drawing. Too, it is a process within reach of all who must work with metal sheets.

The process, of course, has wide adaptability to anything involving the forming of metal in plates and sheets such as tanks or ships.

Magnesium Welding

(*Continued from Page* 100)

steel, the extent of carbide precipitation is low as compared to other methods of welding. This greatly increases its fatigue factor. The medical profession would do well to consider this process for the arc welding of stainless steel braces in bone surgery where spotwelding and other means of attachment have not been so successful.

In Heliarc welding of magnesium structures, a tungsten electrode is used with reversed polarity, making the magnesium the anode. For ferrous and copper alloys, a carbon electrode is used and the welded structure is the cathode. Craters are eliminated in reverse polarity welding.

For the high-temperature melting and

heat-resisting alloys, Heliarc welding has proved successful where other welding methods failed. Heliarc welding is said to give the greatest penetration of any known welding process.

Supervision Ups Output

(*Continued from Page 76*)

good bottom practice lies primarily with the melter foreman. The day of tapping a heat, watching it open up at the platform, and turning the furnace over to the first helper is a thing of the past. As conditions are today with many comparatively inexperienced men operating the furnaces, the melter must exercise the closest supervision after each tap. Any holes, any low or sloppy spots, should never be passed up with the thought that they are not critical, but should be remedied immediately.

The following is a practice which, if maintained by each first helper, will eliminate hours of delay. After tapping the heat—instead of drying the middle and trapping slag at both ends—pull up the end doors, start at the bottom of the bank at one end of the furnace and dry the bottom thoroughly toward the middle. Repeat the procedure at the other end and, lastly, dry the middle lightly. In this manner, you not only keep a thin, fresh, working surface of magnesium-bearing refractory but also maintain the slope of the bottom which is so important and has given rise to the expression, "Keep the ends high and the rest of the bottom will take care of itself."

Under no consideration should aluminum or ferrosilicon be used for cutting out ridges in a basic bottom. Always do this job with air. Fluorspar should be used very sparingly—only where it is impossible to thin slag by usual means.

It might be well to mention here that in the past two years, new, quick-setting materials have been used with signal success for patching deep holes, with a single application. Should deep holes develop, as they will, the saving of burning time is well worth the consideration of every operator. The proper method of application of these new refractories follows.

Clean out the hole thoroughly. Apply a quick-setting hearth patch material as rapidly as possible to the level of the existing bottom. Finish off with a few inches of clinkered dolomite, then burn for two or three hours. Chill for 15 minutes or so, and charge. To the operator accustomed to spending hours at a time burning in such a job, this may sound like "baloney," but the results have been so successful that it is no longer necessary to judge the value of these materials on the basis of theory alone.

More Steel for Civilian Needs Is Under Study

Only most urgent needs likely to profit. . . Deliveries still difficult. . . Pig iron production exceeds all previous years. . . Alloy steel demand far above capacity

DEMAND
Strong, especially for alloys.

PRODUCTION
Advances ½-point to 99½ per cent.

PRICES
Fluorspar ceiling raised.

THE EASIER situation in steel which has developed in recent weeks as a result of limitation orders and balanced production schedules continues to be noted. At the same time it has not developed to the stage of a surplus. Bars and alloy steels continue as difficult to obtain as ever. By diverting semifinished steel from structural shapes and tin plate, however, the supply situation in bars is much better.

In the meantime stocks are in better balance but still have a considerable way to go. Quantities in idle or frozen inventories are large and will help ease the supply. Lower demand for ingots and semifinished steel for lend-lease is a factor, as well as some reduction in certain ordnance programs. Tension has been lessened by all these considerations.

♦ ♦ ♦

Now under way in the War Production Board, in conjunction with the Army and Navy, is a review of present production for civilian purposes. Prevailing opinion is that civilian production has been stripped down excessively and that this condition must be corrected in order to prevent a too-lean economy which would be brought about after our present inventory of civilian goods is exhausted in 1943. Directives are expected in the near future, therefore, which will allow some diversion of steel back into civilian goods production.

Orders are being placed more cautiously in view of the easier overall situation and in many cases this is to restrict inventories, some plate consumers asking that plate shipments be stopped for the remainder of the year. Another reason for caution is experience of PRP consumers in obtaining steel for the current quarter, quotas being cut or ratings lowered. They are inclined to wait until they know their position for next quarter. Indications are that this information will be available earlier than for the current quarter.

Deliveries of steel not under allocation or directive have undergone little change recently, shapes at about four weeks, small bars at five to six weeks, hot-rolled sheets six to eight weeks and cold-rolled five to eight weeks, all applying to top ratings. Large bar rounds and flats can be promised no sooner than second quarter. In some cases structural shapes can be obtained on priorities of AA-4. Galvanized sheets are available from some sources on AA-3 ratings within five weeks.

Steel ingot production last week advanced to 99½ per cent of rated capacity. Only necessity for repairing open hearths keeps the rate below full operation. Chicago advanced ½-point to 102 per cent, Wheeling 3½ points to 86½, Cleveland 2 points to 95, Birmingham 6 points to 95 and New England 10 points to 100 per cent. Detroit dropped 2 points to 96 per cent. Rates were unchanged as follows: Eastern Pennsylvania, 96; St. Louis, 94; Buffalo, 90½; Pittsburgh, 98; Cincinnati, 91; Youngstown, 97.

While tonnage of scrap resulting from the household drive has tended to shrink from the figures claimed by various localities the fact is that proceeds of that effort and other salvage campaigns have stimulated outflow and the situation is decidedly easier. For current needs tonnage is ample and sufficient reserves are being accumulated by some melters to see them through the remainder of the year. The next squeeze is expected to come in first quarter unless results of industrial drives continue flow of dormant material. Apparently the widespread effort to get out household accumulations has created a scrap consciousness that is still paying dividends.

♦ ♦ ♦

Each month during the current navigation season a new record for iron ore shipments has been set, exceeding the best performance for the month in prior years. Most of the former records were set in 1941 when war needs stimulated the trade.

Pig iron production in October has been announced by the American Iron and Steel Institute as 5,236,608 net tons, including ferromanganese and spiegeleisen. Cumulative tonnage for the ten months is given as 49,665,163 tons. This exceeds the full production for 12 months in all prior years except 1941 and is larger than 11 months' output that year. The October total is larger than for any month before 1942.

Price composites for steel and iron are unchanged at levels of prior months, held steady by ceilings of the Office of Price Administration. Finished steel composite is $56.73, semifinished steel $36.00, steelmaking pig iron $23.05 and steelmaking scrap $19.19.

COMPOSITE MARKET AVERAGES

	Nov. 21	Nov. 14	Nov. 7	One Month Ago Oct., 1942	Three Months Ago Aug., 1942	One Year Ago Nov., 1941	Five Years Ago Nov., 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	13.50

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

	Nov. 21, 1942	Oct. 1942	Aug. 1942	Nov. 1941
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.15c
Steel bars, Chicago	2.15	2.15	2.15	2.15
Steel bars, Philadelphia	2.49	2.49	2.49	2.47
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.22	2.22	2.22	2.22
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.10	2.10	2.10	2.10
Plates, Philadelphia	2.15	2.15	2.15	2.15
Plates, Chicago	2.10	2.10	2.10	2.10
Sheets, hot-rolled, Pittsburgh	2.10	2.10	2.10	2.10
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50
Sheets, hot-rolled, Gary	2.10	2.10	2.10	2.10
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50
Bright bess., basic wire, 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

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$34.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods No. 5 to ⅜-inch, Pittsburgh	2.00	2.00	2.00	2.00

Pig Iron

	Nov. 21, 1942	Oct. 1942	Aug. 1942	Nov. 1941
Bessemer, del. Pittsburgh	$25.19	$25.19	$25.19	$25.34
Basic, Valley	23.50	23.50	23.50	23.50
Basic, eastern, del. Philadelphia	25.39	25.39	25.39	25.34
No. 2 fdry., del. Pgh., N.&S. Sides	24.69	24.69	24.69	24.69
No. 2 foundry, Chicago	24.00	24.00	24.00	24.00
Southern No. 2, Birmingham	20.38	20.38	20.38	20.38
Southern No. 2, del. Cincinnati	24.30	24.30	24.30	24.06
No. 2X, del. Phila. (differ. av.)	26.265	26.265	26.265	26.215
Malleable, Valley	24.00	24.00	24.00	24.00
Malleable, Chicago	24.00	24.00	24.00	24.00
Lake Sup., charcoal, del. Chicago	31.54	31.54	31.54	31.34
Gray forge, del. Pittsburgh	24.19	24.19	24.19	24.19
Ferromanganese, del. Pittsburgh	140.65	140.65	140.65	125.33

Scrap

Heavy melting steel, Pitts.	$20.00	$20.00	$20.00	$20.00
Heavy melt. steel, No. 2, E. Pa.	18.75	18.75	18.75	17.75
Heavy melting steel, Chicago	18.75	18.75	18.75	18.75
Rails for rolling, Chicago	22.25	22.25	22.25	22.25
No. 1 cast, Chicago	20.00	20.00	20.00	21.50

Coke

Connellsville, furnace, ovens	$6.00	$6.00	$6.00	$6.25
Connellsville, foundry, ovens	7.25	7.25	7.25	7.25
Chicago, by-product fdry., del.	12.25	12.25	12.25	12.25

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 lease-lend 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. Worcester 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, Bethhlehem, base 20 tons one size, 2.70c; Detroit, del., 2.82c.

(Texas Steel Co. may use Chicago base price as maximum f.o.b. Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

AISI Series	(*Basic O-H)	AISI Series	(*Basic O-H)
1300	$0.10	4100 (.15-.25 Mo)	0.55
1320	0.35	(.20-.30 Mo)	0.60
2300	1.70	4340	1.70
2500	2.55	4600	1.20
3000	0.50	4800	2.15
3100	0.70	5100	0.35
3200	1.35	5130 or 5152	0.45
3400	3.20	6120 or 6152	0.95
4000	0.45-0.55	6145 or 6150	1.20

*Add 0.25 for acid open-hearth.

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 Base	Pacific Ports	Granite 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., 4.30c; .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 the Trade:

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, 12½ 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	$3.85

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

In.	Steel Blk.	Steel Galv.	In.	Iron Blk.	Iron Galv.
⅛	56	33	½	24	3½
¼ & ⅜	59	40½	¾	30	10
½	63½	51	1-1¼	34	16
¾	66½	55	1½	38	18½
1-3	68½	57½	2	37½	18

Lap Weld

In.	Steel Blk.	Steel Galv.	In.	Iron Blk.	Iron Galv.
2	61	43½	1¼	23	3½
2½-3	64	52½	1½	28½	10
3½-6	66	54½	2	30½	12
7-8	65	52½	2¼, 3½	31½	14½
9-10	64½	52	4	33½	18
11-12	63½	51	4½-8	32½	17
			9-12	28½	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.

O. D. Sizes	B.W.G.	—Seamless— Hot Rolled	Cold Drawn	—Lap Weld— Steel	Charcoal Iron
1"	13	$ 7.82	$ 9.01	.....	.....
1¼"	13	9.26	10.67	.....	.....
1½"	13	10.23	11.72	$ 9.72	$23.71
1¾"	13	11.64	13.42	11.06	22.93
2"	13	13.04	15.03	12.38	19.35
2¼"	13	14.54	16.76	13.79	21.63
2¼"	12	16.01	18.45	15.16	.....
2½"	12	17.54	20.21	16.58	26.57
2¾"	12	18.59	21.42	17.54	29.00
3"	12	19.50	22.48	18.35	31.38
3½"	11	24.63	28.37	23.15	39.81
4"	10	30.54	35.20	28.66	49.90
4½"	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	..	67.00c
18.00	4	2	1	77.00c
18.00	4	3	1	87.00c
1.5	4	1	8.5	54.00c
....	4	2	8	54.00c
5.50	4	1.50	4	57.50c
5.50	4.50	4	4.50	70.00c

Stainless Steels

Base, Cents per lb.—f.o.b. Pittsburgh

Type	Bars	Plates	Sheets	H. R. Strip	C. R. Strip
CHROMIUM NICKEL STEEL					
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
*317	50.00	54.00	58.00	50.00	58.00
†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	.....	§§18.00	19.00	.....	.....

*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.
Seconds, maximum prices: flat-rolled rejects 75% of prime prices; wasters 75%, waste-wasters 65%, except plates, which take waster prices; tin plate $2.80 per 100 lbs.; terne plate $2.25; semifinished 85% of primes; other grades limited to new material ceilings.
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.

Bolts, Nuts

F.o.b. Pittsburgh, Cleveland, Birmingham Chicago. Discounts for carloads additional 5%, full containers, add 10%.

Carriage and Machine

¼ x 6 and smaller	65½ off
Do., ⅝ and ⅞ x 6-in. and shorter	63¼ off
Do., ⅞ to 1 x 6-in. and shorter	61 off
1⅛ and larger, all lengths	59 off
All diameters, over 6-in. long	59 off
Tire bolts	50 off
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.
Semifinished hex. ⅞-inch and less	62	64
½-1-inch	59	60
1⅛-1½-inch	57	58
1⅝ 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, ¼-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
⅞-inch and under	65-5 off
Wrought washers, Pittsburgh, Chicago, Philadelphia, to jobbers and large nut, bolt manufacturers l.c.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	Basic	Bessemer	Malleable
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	.....	.....	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%.

Ceiling 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 Ceiling 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

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	36.00
Malleable Bung Brick	
All bases	$59.85
Silica Brick	
Pennsylvania	$51.30
Joliet, E. Chicago	58.90
Birmingham, Ala.	51.30
Ladle Brick (Pa., O., W. Va., Mo.)	
Dry press	$31.00
Wire cut	29.00
Magnesite	
Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Basic Brick	
Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.	
Chrome brick	$54.00
Chem. bonded chrome	54.00
Magnesite brick	76.00
Chem. bonded magnesite	65.00
Fluorspar	

Fluorspar

Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$25.00-28.00
Do., barge	25.00-28.00
No. 2 lump	25.00-28.00

(Prices effective Nov. 23, 1942)

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 lots	Less ton	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.

Molybdic Oxide Briquets: 48-52%, per lb. contained molybdenum, f.o.b. Langeloth, Pa., any quantity 80.00c.

Molybdenum Oxide: 53-63%, per lb. contained molybdenum in 5 and 20 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 $135; ton lots $147.50. Spot $5 per ton higher.

Silico-manganese Briquets: Contract basis in carloads per pound, bulk freight allowed 5.80c; packed 6.05c; ton lots 6.30c; less-ton lots 6.55c; less 200-lb. lots 6.80c. 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.

Ferrovanadium: 35-40%, contract basis, per lb. contained vanadium, f.o.b. producers 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 V_2O_5; contracts, any quantity, $1.10 per pound V_2O_5 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.

Alsifer: (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 ½-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, 1941

	Soft Bars	Hot-Rolled Strip Bands	Hot-Rolled Strip Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24	Cold Rolled Strip	Cold Drawn Bars: Carbon	Cold Drawn Bars: S.A.E. 2300	Cold Drawn Bars: S.A.E. 3100
Boston	3.98	4.06	5.06	3.85	3.85	5.66	3.71	4.68	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
Washington, D. C.	3.95	4.10	4.45	3.80	3.80	5.35	3.60	....	....	....	4.03	....	....
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.

	S.A.E. Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.28	7.75	6.05	5.80	7.90
New York (Met.)	4.04	7.60	5.90	5.65	....
Philadelphia	4.10	7.56	5.86	5.61	8.56
Baltimore	4.45	....	....	....	....
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

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 Birmingham, 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.

Ores

Lake Superior Iron Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer	$4.75
Mesabi nonbessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer	4.60

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63%, contract	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

Chrome Ore

(Equivalent OPA schedules):

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Ore., or Tacoma, Wash.

(S/S paying for discharging; dry basis; subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	41.00
48% 3:1	43.50
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	27.40
45% no ratio	28.30
48% no ratio	31.00
50% no ratio	32.80
Brazilian—nominal	
44% 2.5:1 lump	33.65
48% 3:1 lump	43.50
Rhodesian	
45% no ratio	28.30
48% no ratio	31.00
48% 3:1 lump	43.50
Domestic (f.o.b. Columbus, Mont.)	
48% 3:1	43.50
less $7 freight allowance	

Manganese Ore

Including war risk but not duty, cents per gross-ton unit, dry, f.o.b. cars, New Orleans and Mobile; 5 cents higher at Norfolk, Baltimore, Philadelphia, New York; adjustments for analysis variations. (Based on OPA schedules.)

Brazilian, 48%	73.8c
Brazilian, 46%	71.8c
Caucasian, 51%	75.3c
Caucasian, 50%	74.8c
Chilean, 48%	73.8c
Indian, 50%	74.8c
Indian, 48%	73.8c
South African, 48%	73.8c
South African, 46%	71.8c
(Duty Free)	
Cuban, 51%	86.5c
Cuban, 48%	85.0c
Cuban, 45%	82.0c
Philippine, 50%	85.0c
Domestic, 48%, f.o.b. mines	96.0c

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

NATIONAL EMERGENCY STEELS (Hot Rolled)

Extras for Alloy Content

Designation	Chemical Composition Limits, Per Cent: Carbon	Mn.	Si.	Cr.	Ni.	Mo.	Basic open-hearth Bars per 100 lb.	Basic open-hearth Billets per G T	Electric furnace Bars per 100 lb.	Electric furnace Billets per G T
NE 1330	.28-.33	1.60-1.90	.20-.35	.....	.....	.....	$ .10	$2.00	....	.....
NE 8020	.18-.23	1.00-1.30	.20-.35	.....	.....	.10-.20	.45	9.00	$.95	$19.00
NE 8339	.35-.42	1.30-1.60	.20-.35	.....	.....	.20-.30	.75	15.00	1.25	25.00
NE 8442	.40-.45	1.30-1.60	.20-.35	.....	.....	.30-.40	.90	18.00	1.40	28.00
NE 8613	.12-.17	.70- .90	.20-.35	.40-.60	.40-.60	.13-.25	.75	15.00	1.25	25.00
NE 8715	.13-.18	.70- .90	.20-.35	.40-.60	.40-.60	.20-.30	.80	16.00	1.30	26.00
NE 8949	.45-.50	1.00-1.30	.20-.35	.40-.60	.40-.60	.30-.40	1.20	24.00	1.70	34.00
NE 9255	.50-.60	.75-1.00	1.80-2.20	.....	.....	.....	.40	8.00	....	....
NE 9262	.55-.65	.75-1.00	1.80-2.20	.20-.40	.....	.....	.65	13.00	....	....
NE 9415	.13-.18	.80-1.10	.40-.60	.20-.40	.20-.40	.08-.15	.80	16.00	1.30	26.00
NE 9442	.40-.45	1.00-1.30	.40-.60	.20-.40	.20-.40	.08-.15	.85	17.00	1.35	27.00
NE 9537	.35-.40	1.20-1.50	.40-.60	.40-.60	.40-.60	.15-.25	1.20	24.00	1.70	34.00
NE 9630	.28-.33	1.20-1.50	.40-.60	.40-.60	.....	.....	.80	16.00	1.30	26.00
NE 9642	.40-.45	1.30-1.60	.40-.60	.40-.60	.....	.....	.85	17.00	1.35	27.00

Extras are in addition to a base price of 2.70c. per 100 lb., on finished products and $54 per gross ton on semifinished steel major basing points and are in cents per 100 lb. and dollars per gross ton in semifinished. No prices quoted on vanadium alloy.

MAXIMUM PRICES FIXED BY OPA ON IRON AND STEEL SCRAP

Other than railroad grades quoted on the basis of basing point prices from which shipping point prices and consumers' delivered prices are to be computed. Scrap originating from railroads quoted delivered to consumers' plants located on the line of the railroad from which the material originated. All prices in gross tons. A basing point includes its switching district.

PRICES FOR OTHER THAN RAILROAD SCRAP

				ELECTRIC FURNACE AND FOUNDRY GRADES										
				Low Phos. Grades										
	OPEN HEARTH GRADES*	Machine Shop Turnings	BLAST FURNACE GRADES*	Billet, Bloom Forge Crops	Bar Crops and smaller; Punchings, Plate	Heavy Structural, Plate 3 ft. and less	Heavy Structural, Plate 2 ft. and less	Heavy Structural, Plate 1 ft. and less	Cut Auto Scrap 3 ft. and less	Cut Auto Scrap 2 ft. and less	Cut Auto Scrap 1 ft. and less	Alloy-Free Low Phos. & Sulphur Turnings	First Cut Heavy Axle & Forge Turnings	Electric Furnace Bundles
Pittsburgh, Brackenridge, Butler, Johnstown, Midland, Monessen, Sharon, Steubenville, Weirton, Canton, Youngstown, Warren	$20.00	$16.00	$16.00	$25.00	$22.50	$21.00	$21.50	$22.00	$20.00	$20.50	$21.00	$18.00	$19.50	$21.00
Claymont, Coatesville, Harrisburg, Conshohocken, Phoenixville	18.75	14.75	14.75	23.75	21.25	19.75	20.25	20.75	18.75	19.25	19.75	16.75	18.25	19.75
Bethlehem	18.25	14.25	14.25	23.25	20.75	19.25	19.75	20.25	18.25	18.75	19.25	16.25	17.75	19.25
Buffalo	19.25	15.25	15.25	24.25	21.75	20.25	20.75	21.25	19.25	19.75	20.25	17.25	18.75	20.25
Cleveland, Middletown, Cincinnati, Portsmouth, Ashland	19.50	15.50	15.50	24.50	22.00	20.50	21.00	21.50	19.50	20.00	20.50	17.50	19.00	20.50
Detroit	17.85	13.85	13.85	22.85	20.35	18.85	19.35	19.85	17.85	18.35	18.85	15.85	17.35	18.85
Toledo	...	13.85	13.85	...	...	...	...	...	...	...	...	...	...	...
Chicago	18.75	14.75	14.75	23.75	21.25	19.75	20.25	20.75	18.75	19.25	19.75	16.75	18.25	19.75
Kokomo	18.25	14.25	14.25	23.25	20.75	19.25	19.75	20.25	18.25	18.75	19.25	16.25	17.75	19.25
Duluth	18.00	14.00	14.00	23.00	20.50	19.00	19.50	20.00	18.00	18.50	19.00	16.00	17.50	19.00
St. Louis	17.50	13.50	13.50	22.50	20.00	18.50	19.00	19.50	17.50	18.00	18.50	15.50	17.00	18.50
Birmingham, Atlanta, Alabama City, Los Angeles, San Francisco, Pittsburg, Calif.	17.00	13.00	13.00	22.00	19.50	18.00	18.50	19.00	17.00	17.50	18.00	15.00	16.50	18.00
Minnequa, Colo.	16.50	12.50	12.50	21.50	19.00	17.50	18.00	18.50	16.50	17.00	17.50	14.50	16.00	17.50
Seattle	14.50	10.50	10.50	19.50	17.00	15.50	16.00	16.50	14.50	15.00	15.50	12.50	14.00	15.50

RAILROAD SCRAP

	Heavy Melting Steel	Scrap Rails	Rails for Rolling	Scrap Rails 3 ft. and under	Scrap Rails 2 ft. and under	Scrap Rails 18 in. and under
Pittsburgh, Wheeling, Steubenville, Sharon, Youngstown, Canton	$21.00	$22.00	$23.50	$24.00	$24.25	$24.50
Philadelphia, Wilmington, Sparrows Point	19.75	20.75	22.25	22.75	23.00	23.25
Cleveland, Cincinnati, Middletown, Ashland, Portsmouth	20.50	21.50	23.00	23.50	23.75	24.00
Chicago	19.75	20.75	22.25	22.75	23.00	23.25
Buffalo	20.25	21.25	22.75	23.25	23.50	23.75
Detroit	18.85	19.85	21.35	21.85	22.10	22.35
Kokomo	19.25	20.25	21.75	22.25	22.50	22.75
Duluth	19.00	20.00	21.50	22.00	22.25	22.50
Kansas City, Mo.	17.00	18.00	19.50	20.00	20.25	20.50
St. Louis	18.50	19.50	21.00	21.50	21.75	22.00
Birmingham	18.00	19.00	20.50	21.00	21.25	21.50
Los Angeles, San Francisco	18.00	19.00	20.50	21.00	21.25	21.50
Seattle	15.50	16.50	18.00	18.50	18.75	19.00

CAST IRON SCRAP OTHER THAN RAILROAD

(Shipping point prices in gross tons)

	Group A	Group B	Group C
No. 1 Cupola Cast	$18.00	$19.00	$20.00
No. 1 Machinery Cast, Drop Broken, 150 lbs. & Under	18.00	19.00	20.00
Clean Auto Cast	18.00	19.00	20.00
Stove Plate	17.00	18.00	19.00
Unstripped Motor Blocks	17.50	18.50	19.50
Heavy Breakable Cast	15.50	16.50	17.50
Charging Box Size Cast	17.00	18.00	19.00
Miscellaneous Malleable	20.00	21.00	22.00

Group A includes the states of Montana, Idaho, Wyoming, Nevada, Utah, Arizona and New Mexico.
Group B includes the states of North Dakota, South Dakota, Nebraska, Colorado, Kansas, Oklahoma, Texas and Florida.
Group C includes states not named in groups A and B, plus Kansas City, Kans.-Mo.

***Open Hearth Grades** refer to No. 1 heavy melting steel, No. 1 hydraulic compressed black sheet scrap, No. 2 heavy melting steel, dealers' No. 1 bundles, dealers' No. 2 bundles and No. 1 busheling. No. 1 chem. borings, 1 per cent oil, $1 under, No. 2, 1.5 per cent oil, $2 under heavy melting steel. No. 3 bundles, $2 under No. 1 heavy melting; cast steel, $2.50 over, No. 2 busheling, $2.50 under No. 1 heavy melting steel, auto springs, crankshafts, $1 over No. 1 heavy melting. **Blast Furnace Grades** prices refer to mixed borings and turnings, shoveling turnings, and cast iron borings.

A basing point includes the switching district of the city named. The Pittsburgh basing point includes the switching districts of Bessemer, Homestead, Duquesne, Munhall and McKeesport, Pa. Cincinnati basing point includes the switching district of Newport, Ky. St. Louis basing point includes the switching districts of Granite City, East St. Louis and Madison, Ill. San Francisco basing point includes the switching districts of South San Francisco, Niles and Oakland, Calif.

Inferior Grades: Maximum prices of inferior grades shall continue to bear the same differential below the corresponding listed grades as existed from Sept. 1, 1940, to Jan. 31, 1941. No premium allowed on grades considered superior, unless approved by OPA. Addition of special preparation charges prohibited. Purchase of electric furnace or foundry grades for open hearth or blast furnace use permitted only at no more than price for corresponding open hearth grade. Exceptions: Low phos. billet, bloom and forge crops and electric furnace bundles may exceed open hearth price, and electric furnace bundles may exceed blast furnace price, if material is delivered to the consumer direct from the original industrial producer.

Commissions: No commission is payable except by a consumer to a broker for services rendered, the commission not to exceed 50 cents per gross ton. No commission is payable unless: The broker guarantees the quality and delivery of an agreed tonnage the scrap is purchased at a price no higher than the maximum allowed; the broker sells the scrap to the consumer at the same price at which he purchased it; the broker does not split the commission with the seller of the scrap, with another broker or sub-broker, or with the consumer. Commissions must be shown as separate item on invoice.

Maximum Shipping Point Price: Where shipment to consumer is by rail, vessel or combination of both, scrap is at its shipping point when it has been placed f.o.b. railroad car or f.a.s. vessel. In such cases, maximum shipping point prices are: (1) For shipping points located within a basing point, the price listed in the above table for scrap at the basing point in which the shipping point is located, minus the lowest established switching charge for scrap within the basing point; and (2) for shipping points located outside a basing point, the price in the above table for scrap at the most favorable basing point, minus the lowest transportation charge by rail, water or combination thereof. When vessel movement is involved, dock charges shall be 50 cents at Memphis, $1 at Great Lakes ports, $1.25 at New England ports, 75 cents elsewhere. New England shipping point prices computed on most favorable basing point prices; maximum transportation charge on scrap from New England, $6.65 per ton.

Scrap shipped by motor vehicle is at its shipping point when loaded. For shipping points within basing points, maximum is price listed in table minus lowest switching charge. When outside basing point, maximum is price at most favorable basing point minus lowest established charge when hauled by common carrier. When hauled by seller charges are based on carload rate for rail shipment, minimum $1.00 per ton.

Maximum Delivered Prices: Determined by adding established transportation charges to shipping point price, not to exceed by more than $1 (plus freight rate increase March 18, 1942) the prices listed in the table for the nearest basing point. Certain exceptions specified in Revised Price Schedule No. 4 (Amendment 1) apply to St. Louis district consumers, to WPB allocations, to water shipments from Duluth or Superior, Wis., to shipments of billets, blooms and forge crops from Pittsburgh and to shipments of electric and foundry grades from Michigan; to shipments of turnings to ferroalloy producers and of borings to chemical users. Delivered prices of scrap shipped under WPB allocations may exceed prices at nearest basing point by more than $1, if most economical transportation is used.

Unprepared Scrap: Above prices are for prepared scrap. Maximum prices for unprepared scrap are $2.50 less (railroad grades $3.50 less; material from which Nos. 1, 2 and 3 bundles made is $4 less) than for the corresponding grades of prepared scrap, except for heavy breakable cast. In no case shall electric furnace and foundry grades be used as the "corresponding grades of prepared scrap." Graveyard autos not considered unprepared scrap.

Remote Scrap: Consists of all grades, except railroad scrap, in Florida, Montana, Idaho, Wyoming, Nevada, Arizona, New Mexico, Texas, Oklahoma, Oregon, Washington, Louisiana, Utah. Delivered price may exceed by not more than $5 the price at the basing point nearest consumer's plant, provided sworn details furnished OPA. Permission required to exceed by more than $5 the nearest basing point price. Colorado scrap is remote scrap for Colorado consumers only.

Sheets, Strip . . .

Sheet & Strip Prices, Page 118

Directives are taking a heavy proportion of sheet tonnages and little is scheduled for early rolling on ratings lower than AA-1 and AA-2. Mills are in an easier position though vigor of demand has been lessened, mainly by government curbs on fabricators, controls becoming effective to the point where pressure for deliveries is being lifted.

In some instances quotas for semifinished steel have been increased for December, with consequent lowering of sheet production, both hot and cold-rolled.

Deliveries of hot-rolled sheets average six to eight weeks on top ratings, with cold-rolled material available in five to eight weeks. An exception is found in the case of galvanized sheets, at least one producer offering deliveries as low as AA-3 priority within five weeks. Livelier interest has been shown in galvanized sheet tonnage by several other producers.

Rerolling schedules of narrow cold strip producers are frequently geared to annealing capacity, with some units partially engaged. Based on allocations for hot strip, rerollers are booked through first quarter and are taking on new commitments cautiously, although inquiry is heavy, practically 100 per cent war contracts. Under directives, allocations of alloys have been reduced to more essential uses, and, while the ratio of new bookings runs heavily to high carbon, slightly better volume of low carbon is filtering in. Production schedules are frequently readjusted to meet priority revisions and changes in specified deliveries. Some mills have large backlogs of cartridge link steel; with pressure for deliveries increasing, capacity is fully engaged.

Nonintegrated sheet producers, operating well below capacity, see little possibility of change in their situation in the immediate future. Some operators feel that once the Controlled Materials Plan starts to operate, a way will be opened for more consistent operations, but it is equally true that much of the business now on books, which has been held up for lack of semifinished steel, may be canceled and not reinstated under CMP.

Faced with a serious manpower problem already, sheet mill operators hope for a better allocation in December to maintain a reasonable volume of work for their employes, many of whom are leaving for jobs carrying more hours of work per week. This is particularly true in cold sheet mills, where lack of demand for sheets and sharp curtailments in cold-rolled black plate for tinning have reduced operations sharply. It is particularly important for cold mills to maintain a good working force, as spring demand for tin plate will be high and will come suddenly. Some tin mill operators have been exerting pressure for immediate increases in allotments of steel to build up larger cushioning stocks of plate, as well as insuring sheet mills sufficient business between now and the spring peak to keep the men on the job.

Plates . . .

Plate Prices Page 119

While there is an easing in the plate situation, reports indicate that shipyards will make much heavier demands and as they are the principal consumers there may again be a pronounced stringency. While few new shipyards are under contemplation for the proposed increase in the ship program, new ways and certain other facilities are expected to be added to existing yards.

Meanwhile, a heavy tonnage is being consumed for ship work, with no little proportion going into the construction of landing craft. Many small yards in the East are engaged in the building of this type.

Bars . . .

Bar Prices, Page 118

Deliveries continue easier on small bars. A consumer recently was offered shipment in three to four weeks on 1-inch rounds carrying a rating of AA-5. There is no difficulty, apparently, in getting shipments before the end of this year on diameters up to 1½-inch, especially where top ratings are involved. Large rounds and flats have shown little improvement, however. Some producers are unable to promise shipment of the very large rounds before second quarter.

Cold draws assert that carbon bars are being received at a generally satisfactory rate under the allocation plan which went into effect Oct. 1 on carbon grades. One cold drawer reports that his November allocation from one mill has already been received. On the other hand, although this is exceptional, an-

other cold drawer still has some tonnage due on an October allocation from one mill.

Cold drawers are being urged by Washington to use more bessemer steel. A couple of years ago these processors were using about an equal percentage of bessemer and open hearth, but today they are using about 86 per cent open-hearth steel and 14 per cent bessemer. This shift, they claim, has been due to the type of specifications from buyers engaged in war work. Most cold drawers believe that the greater use of open hearth is something they can do little about and that Washington should bring pressure on government agencies to revise specifications where possible so that more bessemer could then be used.

A decrease in the demand for gun mounts is being reflected in the purchase of cold-drawn bars. It is estimated that the average gun mount of the type now being made takes about 1000 pounds of cold-drawn steel.

Wire . . .

Wire Prices, Page 119

Growing concentration of wire output on fewer products is more evident; numerous specialties normally used in the fabrication of civilian goods are steadily eliminated or curtailed. Schedules are more and more centered on wire entering into war equipment. Departments devoted to this are operating at capacity, while pressure is eased on others. Aggregate new orders are slightly ahead of shipments; demand for aircraft, including numerous alloy specialties, is mounting and equipment producing signal corps wire and balloon barrage cable is heavily loaded. Ratio of high carbon rounds is high and demand on annealing and other heat-treating equipment is heavy.

Directives apply to a larger volume of current finishing, and, while some consumers have been rerated downward on requirements most production is on AA-2 or better and directives. Deliveries on lower priorities are more extended; while end-use symbols have been technically suspended, ultimate use of material remains an important factor in approving all new orders. Except for fabrication into war goods, spring production is sharply reduced.

For aircraft, most volume is under directives and is processed first. Barrage cable excepted, pressure from rope mills for stranding wire is somewhat easier. Broader distribution of rods under directives is giving nonintegrated mills more semifinished for finishing high-rated orders, but little above such requirements. Most barbed wire has been going to the armed services, types and styles having been simplified, but some provision for slightly heavier production for civilian needs is being given consideration. Demand for nails is unabated, direct shipments being heavy at the expense of quotas to jobbers. Welded fabric for reinforcing and cold-finishing flat wire is lagging.

Structural Shapes . . .

Structural Shape Prices, Page 119

Welding equipment at structural fabricating shops with subcontracts for ship work, barges, pontoons, lighters and miscellaneous war equipment are operating on a 24-hour basis; some are training additional welding crews. Construction backlogs are dwindling with new inquiry absent; fabricators are completing scattered contracts, but by the middle of first quarter little tonnage will remain to be fabricated unless new construction programs develop, which appears unlikely.

Reratings have allowed several power house contracts in the midwest to go ahead, but other projects are being stripped of all structural steel possible, including several synthetic rubber plants. Substantial part of the steel fabricated by sub-contract is directly allocated, frequently by the prime contractor.

Plain material deliveries continue to improve even on lower ratings, some producers doing four to five weeks down to AA-5. By far the larger part of demand is for shipbuilding by allocation, channels, angles and lighter material predominating, while structural shops are fabricating more plates than usual, a trend growing directly from ship work. Demand for heavy beams and columns is light.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 119

While mill and distributor allocations of concrete reinforcing bars have been substantially reduced, stagnant demand makes for an easier situation and price shading to consumers has returned

with competition for tonnage. Shipments continue against scattered large contracts for government construction, but new orders are for small lots. Nearby stocks are in better balance, both as to tonnage and sizes, and bars are available against lower priorities with deliveries improved.

Due to restrictions on the use of steel for reinforcing and curtailed construction, few low ratings are out, however, and most volume carries AA-5 or better. Substantial semifinished steel supply normally going into reinforcing bars is available for other products while more off-heat material, usually rolled into concrete bars, is being routed in other directions, restricted demand for reinforcing not absorbing the usual tonnage.

Pig Iron . . .

Pig Iron Prices, Page 120

Revision of PD-69 pig iron forms is under way and while no date has been announced as to when they will be issued it is assumed they will be available for making requests for January tonnage. Revision is said to be necessary because of elimination of allocation symbols.

Sellers expect to receive December allocations about Nov. 25 and in view of the trend of applications it is believed a still higher proportion of iron will be in the top priority bracket. Some sellers found fully 90 per cent of November tonnage was in the highest bracket.

Temporarily, pig iron allocations appear to have reached peak. Indications are not lacking to warrant the supposition demand for castings by the machine tool industry may ease early next year, for while tool builders have large backlogs, new bookings have declined in recent weeks. Foundries supplying castings to machine shops have kept well up to scheduled deliveries and some have maintained sizable banks of parts. Scattered foundries, notably jobbing shops, could handle more war contracts, also most stove makers.

Scrap . . .

Scrap Prices, Page 122

Scrap consumers generally are in better position than for some time and the outlook for winter supply is much improved. While some shortages are likely to occur because of adverse winter conditions the general situation is viewed hopefully, in view of the way stocks are accumulating. In numerous instances steel mills have supply for 60 days or longer. In some cases shipments have been held up temporarily.

Most dealers are well stocked with material awaiting preparation because of depleted labor forces. Cast scrap is also in good supply, especially cupola cast, dealers being disposed to break heavy cast to cupola size to obtain the premium. Low phosphorus scrap is more plentiful but still is short of demand and electric furnace and acid open-hearth operators are less comfortably situated than basic open-hearth melters.

Scrap reserves by steelmakers in the Buffalo district are estimated at 210,000 tons and this is believed enough, with normal shipments from yards, to supply requirements until spring. One steel mill is holding up shipments temporarily. Yards have large backlogs from the recent drives which will be shipped as soon as prepared. Industrial scrap from manufacturing operations is in better volume.

A feature of the situation in the St. Louis area is the preponderance of cast grades. Mills and foundries have ample supplies and many yards have more than they can handle conveniently. Some offerings of cast scrap are being turned down by dealers. Several melters have made fair additions to reserves.

Pittsburgh consumers are in easier position, allocations having aided those which were short in recent weeks. Some accumulatons are being made, though not large. The situation seems secure for the remainder of the year, but first quarter supply is questionable under present indications. Material from household collections has not been completely sorted and offers a backlog for future weeks.

Recovery of steel scrap from the bottom of Boston harbor alongside Mystic pier of the Boston & Maine railroad is yielding tonnage. Thousands of tons destined for Japan was loaded at this pier during the thirties and some fell off the magnets into the water. Recently a grappling crane was utilized to pick up the scrap and about 500 tons has been salvaged.

Automobile wreckers are offering lower prices for wornout cars rounded up in current campaigns. One reason

for this is lighter demand for used parts, which normally has given wreckers the main portion of their profits. In the New York district the average price paid is $7.50, with the trend lower. In New England as low as $3 is being offered. In three months 270 wrecking yards in the New York area dismantled 24,760 old cars, recovering 18,570 tons of scrap. Present stocks of cars for scrapping are only 20 per cent of the number in March.

Warehouse . . .

Warehouse Prices, Page 121

Moderately heavier replacements of hot-rolled steel products, notably structurals, plates, hot strip and small rounds, supplemented by tonnage from frozen inventories, allow most warehouses slightly larger volume for current sales, demand holding brisk. Cold-finished, alloys and galvanized sheets continue tight with full force of directives applying to jobber deliveries from mills not expected to be felt until mid-December or even later on most alloys.

Downward revised ratings under recent PRP allocations tend to increase the ratio of sales in the AA-3 and AA-4 classification, and while some progress is noted in thinning out accumulations of higher ratings, AA-1 inquiries are still substantial. While some warehouses have been drawing from frozen inventories sizes and stock which fit into standard lines, likelihood of better mill deliveries on a broader range of products, has slackened efforts to fill gaps from these sources. Products drawn from frozen inventories are applied against quotas and the profit margin is narrowed by ceiling prices plus costs and freight.

Tin Plate . . .

Tin Plate Prices, Page 119

Although the electrolytic tin plate program is running considerably behind schedule as a result of delivery difficulties and new technical problems inherent in a new process, the chances are that the delay will have little effect on the 1943 tin plate program.

This does not imply that the bulk of next year's plate will continue to be hot dipped. As a matter of fact, tin curtailments will continue to be so dramatic that production of the various bronzes will take more tin than will can production. That is the case now and it will continue next year.

The answer on electrolytic tin is that early construction schedules called for these lines to be completed before they would actually be needed under the curtailed program, and as a result completion dates will be pretty much in line with the demand curve for cans.

This may not be true of the bonderizing units. Delay has been greater on these lines, and in all probability they will not be available to carry much load during 1943, at least during first half. It is also seen possible that demand for bonderized plate will not be so heavy as had been anticipated, nor is there likely to be as much sheet available for bonderizing as was anticipated when the program was set up.

Current tin plate production schedules have been pared to the bone to keep fourth quarter output within the limitations established by WPB. Tin mills are hoping sufficient steel will be allotted during December to keep their forces intact, and that first quarter volume will be stepped up sharply to make some preparations for the early packs.

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

Metallurgical Coke . . .

Coke Prices, Page 119

Coke supply and demand seem to be well balanced. Demand for both foundry and furnace coke is heavy but apparently supply is adequate; in some cases, with a little to spare.

An indication of the market condition is activity of certain operators near Mt. Pleasant, Pa., who are attempting to salvage and market a huge pile of small-sized coke ranging from approximately 1½-inch to breeze, which was discarded during a period of 40 years' operations by the H. C. Frick Coke Co. This material is of low grade and thus far there has been no report of any being sold into consumption, although operations have been going on for some time in preparation.

It is possible some would find its way into the domestic market, but it is generally believed the ash content is too high for economical industrial use. Sufficient coke is available from regular sources so that fuel of this nature is not yet needed by industry.

Some interests feel the 50-cent increase in the ceiling on beehive furnace coke is not giving as much aid to marginal beehive producers as was expected. Operations for last half in a good many instances do not show sufficient profit to warrant further production in view of difficulty in maintaining sufficient force to operate the ovens and provide substantial supply of suitable coal.

In connection with this latter difficulty, some consumers have lowered their requirements so that higher sulphur content now is accepted, but there have been numerous rejections on this basis resulting from the use of inferior coal.

Fluorspar . . .

Fluorspar Prices, Page 120

An increase in maximum prices on metallurgical fluorspar, designed to stimulate production, expand facilities and encourage new producers to enter the field, has been announced by Office of Price Administration, effective Nov. 23. This action is one of a number of steps by government agencies to expand fluorspar output. The price increase is regarded as an essential part of such a program because of the necessity of opening up deposits inaccessible and submarginal at present prices and because of the need for substantial exploratory and development expenditures by present operators.

The new base ceiling prices range from $25 to $28 per net ton, according to calcium fluoride and silica content, compared with $23 to $25 for top-grade fluorspar previously. The prices are subject to freight adjustments.

At the same time, dollar and cents ceiling prices are established for acid grade fluorspar, except in the Illinois-Kentucky district. The new prices are based on $32 per net ton for material with a minimum calcium fluoride content of 97½ per cent and maximum silica content of 1½ per cent, subject to freight adjustments. Resulting f.o.b. mine prices are in line with the level of maximum prices heretofore established for each producer.

Iron Ore . . .

Iron Ore Prices, Page 121

Every month so far during the navigation season a new record has been set in tonnage of iron ore transported on the Great Lakes. Tonnage moved and the previous record for each month in prior years is as follows, according to statistics of the Lake Superior Iron Ore Association, Cleveland:

	Gross Tons 1942	Previous Record
March	792,602	0
April	7,857,106	6,954,793 in 1941
May	12,677,356	11,081,199 in 1941
June	12,625,102	10,789,191 in 1941
July	13,405,506	11,390,487 in 1941
August	13,235,862	11,496,303 in 1941
September	11,847,919	10,311,517 in 1941
October	11,417,167	10,061,127 in 1940

All imported metalliferous ores and concentrates have been excluded as of Nov. 24 from provisions of the General Maximum Price Regulation. Also excluded were domestic and imported blister copper and lead bullion.

The exclusions were made at the request of the Metals Reserve Co. to relieve it of the administrative detail involved in pricing the many varieties of ores and concentrates which it imports and resells.

Since issuance of the War Production Board order restricting importation of strategic and critical materials by private importers, Metals Reserve Co. has become the most important domestic seller of imported ores and concentrates. It is the sole domestic seller of many ores and concentrates.

The exclusions were made through Amendment No. 36 to the General Maxi-

mum Price Regulation, and become effective Nov. 24, 1942.

Domestic ores and concentrates of metalliferous character already were exempt from the General Maximum Price Regulation before the issuance of today's amendment. By interpretation, the sale of foreign ores and ore concentrates to a purchaser in the United States was also exempt if the purchaser or his agent dealt directly with the seller in a foreign country. Essentially, the only remaining important transactions excluded by today's action were those involving a resale in the United States of foreign ores and concentrates by a domestic importer. In addition, the amendment exempts all sales of domestic or imported blister copper or lead bullion.

This amendment leaves metalliferous ores and concentrates free from all price control unless they are covered by a specific individual price regulation, such as Maximum Price Regulation No. 113 (Iron Ore Produced in Minnesota, Wisconsin and Michigan).

Pacific Coast . . .

Seattle—While gold mining is at an end in Alaska, due to the recent government order, 15 properties in the territory will continue to operate with P-56 WPB ratings. These mines range from Ketchikan to the Kuskokwim river and the interior and produce such essentials as copper, palladium, chrome, zinc, platinum, mercury, tungsten, antimony, cinnabar and lead.

United States engineers are mapping the upper Columbia river area between Coulee and Foster creek, proposed site of another power project, planned as one of six plants on this river to develop 90 per cent of the potential power of the stream between the Canadian border and the Snake river. The project would be 2000 feet long, 225 feet high and cost more than $55,000,000, as estimated in 1931. A more detailed survey is planned next year.

Seattle has agreed to terms of a $1,800,000 federal loan to construct the $10,000,000 Ross dam addition, Skagit power project. One bid to cover the entire job, including cement, penstocks and valves will be invited soon.

Unusually dry weather in the Pacific Northwest this fall has thrown an additional burden upon Bonneville and Coulee, which have supplied between 40 and 50 per cent of the power needs of Oregon and Washington, supplementing a number of other public plants and private utilities.

From pulp production to outfitting ships is the transition being made this month by the $8,000,000 Kraft-St. Regis Paper Co. at Tacoma, Wash. Pulp manufacture stopped Nov. 1 under a WPB order and officials devised a plan to keep the plant in operation. It holds a contract to furnish equipment for army tugs and cargo vessels being built by the Birchfield Shipbuilding Co., Tacoma, and expects other awards which will keep the plant busy for the duration.

Ames Shipbuilding & Drydock Co., Seattle, has a contract to construct a $350,000 steel caisson for the Puget Sound navy yard. Stetson-Ross Machine Co., Seattle, has an RFC allocation, of over $250,000, for construction and equipment of a plant in this state. The company's local shop manufactures woodworking equipment.

Gov. Sprague reports that Oregon's scrap drive has totaled 80,000 tons. An intensified rural campaign is expected to fill a 100,000-ton quota.

Tacoma opened bids Nov. 9 for an unstated tonnage of plates required for penstocks and tunnel supports for the second Nisqually power project. A Tacoma housing project is reported delayed due to inability to obtain sufficient cast iron water pipe. Bremerton, Wash., has called bids Nov. 19 for 9380 feet of cast iron pipe for extensions rating a high priority.

General Construction Co., Seattle, has the contract at $1,794,150 to build substructure of a 1000 x 400 foot terminal for the Port of Seattle. Army engineers will soon call bids for an adjoining pier, 500 x 400 feet.

United States engineers continue to place major contracts. Extensions to an army base in eastern Washington, in excess of $100,000, will be built by Max J. Kuney and associates, Spokane. Moore & Roberts, Spokane, have the contracts for a number of buildings. The Seattle office has placed seven contracts for warehouses, radio repair stations, water, light and sewer systems in Spokane, Clallam and Snohomish counties, Washington state. Anderson Building Co., Spokane, will construct a treatment plant in Eastern Washington. Hawkins & Armstrong, Seattle, have the contract to erect army hangars in the interior.

Canada . . .

Toronto, Ont.—While there has been no slowing down in war demand for iron and steel, there have been indications of a change of attitude on the part of some mill representatives in accepting business not of a vital war nature. In this respect some mills are taking orders for steel for delivery on an if, as and when basis. That is, while no definite delivery date is given and no promise is made regarding shipment they accept the order in the hope there may be some easing in war demand which will enable them to fill the contract. This might appear to be more of a goodwill gesture than an actual business commitment.

Fresh orders for steel are appearing in increasing volume in connection with Canada's expanding war production program, and the government is calling for production on an ever increasing scale. Officials of Dominion Steel & Coal Corp. Ltd., Sydney, N. S., announced that their new open-hearth furnace has been completed and is now in production. This new furnace will add 75,000 tons yearly to the company's ingot production, and bring its total rated steel capacity to 675,000 tons a year. The new blast furnace is still being held up by delays in securing necessary equipment from the United States, but is expected to blow in early next year. Steel Co. of Canada Ltd., Hamilton, Ont., also is meeting serious problems regarding equipment deliveries for its new electric furnace and bessemer converter. Algoma Steel Corp. Ltd., Sault Ste. Marie, Ont., is closing down three open-hearth furnaces for repairs, which will temporarily reduce steel output.

Canada has delivered some 650,000 tons of new merchant ships this year and according to government plans, will bring the total for the full year to 1,000.000 tons. In order to reach this high production schedule, it is stated that plate and other steel imports from the States will have to be increased. At present Canadian plate mills are producing well above rated capacity and no further increase in production can be expected from this source until additional capacity is available. Under the big demand on shipbuilding, tank construction and other war needs, practically all domestic plate output is directly associated with the war effort and only small tonnages are being made available to other essential consumers. Rolling stock builders are pressing for plates to complete contracts, but are getting little response in deliveries. Some plate is going to base metal mines for the purpose of stepping up production of critical war metals, but mostly these shipments are in small lots, ranging from five to 20 tons.

A new flurry appeared in sheets last week, when a number of large tonnage orders reached the market from three or four of the more important war plants, including electric equipment makers. As these buyers are listed in top priority brackets, they can be assured of fairly early delivery. Other inquiries were numerous and while some of this business was accepted mill representatives gave no assurance as to delivery.

Inquiries for bars of all kinds, but with special reference to alloy and carbon, were decidedly heavy during the past week, indicating that a substantial gain in Canada's war materials production is becoming an actuality. Co-operating with the steel controller, Canadian mills are spreading their output of bars over as wide an area and as many consumers as possible. Bar mills continue below rated capacity, due to shortage of steel.

There has been sharp curtailment in structural steel lettings and also in reinforcing bars, directly due to severe restrictions on new construction projects announced a few weeks ago by government representatives. While fabricators still carry substantial backlogs, tapering of new contracts is expected to cause a sharp swing in many of these plants to other products within the next few months. Several plants already have started to change over to other products. Mills are turning down orders for reinforcing bars.

Merchant pig iron sales held at about the same level as the previous week, about 6000 tons. While no special features developed in the pig iron markets, blast furnace operators state that deliveries are being made only to war melters. Sales and deliveries are in one or two carlots.

Steel in Europe . . .

London—(*By Radio*)—Increasing demand is being met in Great Britain for special and alloy steels and shipbuilding material, to support the heavy war program. Foundry pig iron requirements are on the increase as more castings plants convert to defense needs. Black sheets are also in active demand.

Nonferrous Metal Prices

Nov.	Copper, Electro, del. Conn.	Copper, Lake, del. Midwest	Copper, Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
1-19	12.00	12.12½	11.75	52.00	52.00	6.50	6.35	8.25	15.00	14.50	35.00

F.o.b. mill base, cents per lb. except as specified. Copper and brass products based on 12.00c Conn. copper

Sheets

Yellow brass (high)	19.48
Copper, hot rolled	20.87
Lead, cut to jobbers	9.75
Zinc, l.c.l.	13.15

Tubes

High yellow brass	22.23
Seamless copper	21.37

Rods

High yellow brass	15.01
Copper, hot rolled	17.37

Anodes

Copper, untrimmed	18.12

Wire

Yellow brass (high)	19.73

OLD METALS

Dealers' Buying Prices
(In cents per pound, carlots)

Copper

No. 1 heavy	9.25-10.00
Light	7.25- 8.00

Brass

No. 1 composition	8.50- 9.00
Yellow brass castings	5.50- 6.00
Auto radiators	6.12½-6.62½
Red brass, borings & turnings	8.00- 8.50

Zinc

Old	4.75- 5.00
New clippings	6.00- 6.50

Aluminum

Clippings	9.75-10.25
Cast	8.75- 9.25
Pistons	8.50- 8.75
Sheet	8.75- 9.25

Lead

Heavy	4.75- 5.25
Mixed babbitt	5.35- 5.50
Electrotype shells	5.00- 5.50
Stereotype, Linotype	6.00- 6.75

Tin and Alloys

Block tin pipe	44.00-46.00
No. 1 pewter	32.00-36.00
Solder joints	7.75- 8.50

SECONDARY METALS

Brass ingot, 85-5-5-5, l.c.l.	12.50
Standard No. 12 aluminum	14.50

MAGNESIUM

(12 pound rod, 4 in. diam.)

99.8% ingot, carlots	22.50
100 lb. to carlots	24.50
Extruded sticks, ¼ to 2 lb.	
Carlots	32.00
100 lb. to carlots	34.00

Nonferrous Metals . . .

New York — The original expansion program which provided for additional capacity of 850,000,000 pounds of aluminum has been completed, according to WPB, and plants projected in the second program now are beginning to come into operation. Contracts for the second program, calling for 600,000,000 pounds in added capacity were signed in February and March of this year.

It is officially estimated that at least 3,000,000,000 pounds of aluminum, including 600,000,000 pounds of secondary ingot, will be available for consumption in 1943. C. B. Henderson, chairman of RFC and president of MRC, has announced that Defense Plant Corp. has made commitments aggregating $666,718,307 related to the aluminum program and accounting alone for capacity "about three times the total United States aluminum output of 1940."

Mr. Henderson also revealed that some 2500 copper, lead and zinc mines in 27 states will benefit from the policy established by the Metals Reserve Co. of paying a premium for "over-quota" production.

MRC is encouraging the expansion of zinc smelting facilities through agreements to purchase all or a part of the output of two specific smelters and through arrangements to furnish supplies of zinc concentrates to numerous smelters throughout the country.

Defense Plant Corp. has made commitments of $71,987,487 for production of copper, lead and zinc; $370,511,118 for production of magnesium, increasing capacity to nearly 50 times the total amount produced in 1940.

MRC's tin smelter at Texas City, Tex., it operating well in excess of 18,000 tons of refined tin per year and soon will be expanded to handle the equivalent of all the tin ore available to the United States.

Equipment . . .

New York—With new orders slackening, continuance of the trend apparent in recent months, coupled with directives revising delivery and production schedules, the machine tool industry is going through a period of transition with deliveries substantially improved on several types and sizes of lathes, milling, boring and other units. On some of these, builders are able to make deliveries in three to four weeks. Orders for the aircraft industry are maintained with heavier buying in spots, notably for a Pratt & Whitney engine plant at St. Louis. Aircraft has been placed at the top of the emergency list with three-fourths of the production of any machine tool earmarked for the industry if necessary. Fewer orders are appearing for ordnance and the trend in buying is sensitive to changes in the war production program. In this connection increase in the aircraft production program is evident, which may be aimed as high as 50 per cent. Inquiries are out with quotations in on considerable ship yard shop tools for larger capacity at Brooklyn, N. Y., and Hoboken, N. J.

Boston—Diverted deliveries centering largely in heavier shipments to the aircraft industry and its suppliers, with curtailed orders resulting from revised war production programs, are improving deliveries on some machine tools, with scattered cancellations on other types. Ship-

ments are frequently diverted to fabricators in greatest need of tools at the expense of the original purchaser, revising delivery and production schedules. Confusion growing out of recent directives is sending some builders to Washington for clarification. Current orders are below shipments on most tools and builders are biting into backlogs moderately, although many at the present rate have volume through most of next year.

Demand for machine tools has by no means dried up; normally bookings would still be considered heavy and considerable volume is in prospect, but the overall downward trend of recent weeks continues. Special negotiated contracts continue to be closed by the service departments and pool orders are on books for delivery into second quarter but new pool buying is less active beyond that period.

Seattle—Results to date of the survey by WPB of used machinery and equipment in Washington, Idaho and Alaska are reported satisfactory although many firms are yet to report. Logging, mining and construction firms are co-operating heartily, officials stating that in view of the urgent need of equipment no used machinery that can be reconditioned should remain idle. Unable to obtain new equipment, except for government uses, dealers are trading in used equipment. In some instances contractors are unable to offer on new projects because they have insufficient machinery. Automotive and all classes of earth-moving equipment are in exceptionally strong demand. Oregon state highway department received a high offer of $4250 for sale of a used Lorain gas shovel. Much of the equipment used at Coulee dam has been dismantled, many of the cranes having been shipped to Pacific Coast shipyards.

Lukens Steel Experiences Second Flood Interruption

After prompt recovery from the flood of Aug. 9 Lukens Steel Co., Coatesville, Pa., encountered another inundation Oct. 26, which forced its plant and that of the By-Products Steel Corp. to close several hours. Flood debris clogging intakes cut off water supply to open hearths and power plant.

In the earlier flood, which covered the plants with several feet of water, production was resumed within a week, except for one mill. Immediately following, in the four weeks ended Oct. 10, the plants set all-time records in production.

Wing Tips

(*Concluded from Page* 54)

sions of the new council had a good pattern to follow, in the Automotive Council for War Production, which has drawn some 400 former automobile and truck plants, together with their scores of parts suppliers, into a co-operative association.

Latest word is that the next step will be to organize a Midwestern Aircraft War Production Council, after which the logical move would appear to be the consolidation of all three divisions into a centralized, aggressively managed office. This probably would spell the end for the ACCA, if the handwriting is not already observable on the wall.

"Cycle System" of Assembly

Methods Engineering department of Republic Aviation Corp., Farmingdale, N. Y., has introduced an improved assembly plan known as the "cycle system" in the wing shop of that plant, and it has proved so effective that it is being applied to other departments. Under the system, crews move from one jig to another in orderly sequence to complete a number of operations in a specified time. Saving of time is effected through co-ordination of the flow of materials and subassemblies. "Cycle" crews now work on wings, fins, elevators, rudders and tails of the P-47 pursuit plane, and shortly the entire fuselage will be handled in the same way. A feature of the system is the use of a group of skilled craftsmen known as the "Hot Shots," who move in to assist regular crews when, because of one reason or another, it appears an assembly or operation cannot be completed in the allotted time.

NEW BUSINESS

Plant Expansion, Construction and Enterprise, Government Inquiries, Sub-Contract Opportunities, Contracts Placed and Pending

SUB-CONTRACT OPPORTUNITIES

Data on subcontract work are issued by regional offices of the War Production Board. Contact either the office issuing the data or your nearest field office. Write, don't telephone, and mention key letters and numbers appearing before each item to assure prompt attention and avoid delay.

Detroit office, Contract Distribution Branch, Production Division, WPB, Boulevard building, is seeking contractors for the following:

Job No. 2938: Forging source for local prime contractor, front and rear hubs, hot-rolled steel. Requirements are for 100,000. Prime will consider more than one subcontractor. Priority is A-1-a.

Jobs No. 3088 and 3089: Subcontractor desired to handle both jobs. No. 3088, main gear. Machining operations on steel castings, which are furnished. Vertical boring mill, two operations, 100 inches O.D.; gear hobber, involute tooth; heat treating. Order is for 12 on A-1-a priority. No. 3089, main pinion. Machining operations on steel forgings which are furnished. Vertical boring mill, two operations, 18 inches O.D.; gear hobber, involute tooth, heat treating. Order is for 12 on A-1-a priority.

Jobs No. 3091 to 3094: Bracket. Local prime contractor desires forging and machining sources on four jobs. Material, WD No. 4140 steel. Equipment needed, forging; hammer, flash trimmer, vertical mill, sensitive drill, hand screw machine. Requirements are 800 on each job. Priority is AA-1.

Jobs No. 3128 to 3152: Airplane parts. Prime contractor seeks production facilities on these jobs. Various types of material are involved. Equipment required, hand screw machines, centerless grinders, sensitive drills, arbor presses, keyseater or broach, hand mill, punch press, gear hobber, vertical mill. Order is for 1000 to 2000 on each job. Priority is AA-1.

Jobs No. 3154 to 3157: Prime contractor seeks production facilities on following gun parts: No. 3154, buffer rivet, WD No. 1035, SAE No. 1035 steel, $\frac{5}{32}$-inch O.D. Automatic screw machine required. Order is for 4000. No. 3155, feed box rivet, WD No. 1035, SAE No. 1035, $\frac{5}{32}$-inch O.D. Automatic screw machine required. Order is for 4000. No. 3156, tie, WD No. 1020, SAE No. 1020, $\frac{1}{8}$ x 3 inches. Equipment required, cutoff saw, mill, sensitive drill. Order is for 2000. No. 3157, halves. Equipment required, horizontal mill; H.D. drill, 14 operations; sensitive drill, 47 operations; tapper; vertical mill; nibbler. Order is for 1000. All four jobs on AA-1 priority.

Jobs No. 3296 to 3306: Various types of fittings for 11 jobs listed. Material, stainless steel, Navy specification No. 46518, which is furnished. Equipment required, automatic screw machines, $\frac{3}{32}$ to $\frac{1}{4}$-inch; sensitive drill. Orders are for 25,000, 50,000 and 100,000 on each job. Priority is AA-1 or better. Samples at exhibit room.

Jobs No. 3308 to 3314: Prime contractor has listed seven jobs covering machining operations. Material is furnished on AA-1 priority, include worms, worm wheels, worm gears.

Jobs No. 3345 to 3350: Sleeves, housings, guides, plungers. Various types of material are involved and prime contractor will assist in securing. Equipment required, automatic screw machines, $\frac{5}{8}$ to $1\frac{1}{8}$-inch; lathes or centerless grinders, mill, external grinder, sensitive drill, tapper. Orders are for 500,000 on each job. Priority is AA-1.

Jobs No. 3390 to 3403: Various small screws, steel. Equipment required, automatic screw machines with mill or screw slotter attachment. Orders are for 10,000 each on A-1-a priority.

Job No. 3421: Pin float. Type No. 416 stainless steel, $\frac{5}{32}$-inch. Equipment, cutoff machine, centerless grinder two operations, immunize. Order is for 25,000 at 5000 per month. Priority is A-1-a.

Job No. 3422: Pin. Type No. 303 stainless steel, 13/64-inch. Equipment, screw machine, bench vertical broach, sensitive drill, centerless grinder, immunize. Order is for 50,000 at 10,000 per month on A-1-a priority.

Job No. 3424: Venturi tube, AMS No. 4118 aluminum alloy, $1\frac{13}{16}$-inch. Equipment, hand screw machine, lathe with collet, sensitive drill, anodic treatment. Order is for 25,000 at 5000 per month on A-1-a priority.

Job No. 3425: Valve blank, AMS No. 5640 stainless steel, $\frac{7}{16}$-inch. Equipment, hand screw machine, mill, centerless grinder. Order is for 20,000 at 5000 per month on A-1-a priority.

Job No. 3426: Needle blank, AMS No. 5640 C.D. stainless steel. Equipment, hand screw machines, centerless grinder. Order is for 20,000 at 5000 per month on A-1-a priority.

Minneapolis office, Contract Distribution Branch of WPB, 334 Midland Bank building, is seeking contractors for the following:

S.O. No. 285: Machining of three parts. Two are aluminum die castings furnished by prime contractor, approximately 5 inches diameter, by 2½ inches; third is machined from 5-inch seamless steel tubing and is 6 inches long. Primary operation, turning.

S.O. No. 286: Machining of three parts, quantities 1000 of each. Material is furnished. Deliveries over six months, starting in December. Spring thrust plate, SAE 6150, approximately ½ x 1 x $\frac{7}{16}$; operation, milling; tolerance, .004. Spring retainer, SAE 4140, approximately ¾ x $1\frac{3}{16}$-inch; operations, turning, drilling, tapping, milling; tolerance, .004. Piston valve, phos. bronze, $1\frac{1}{4}$ x $4\frac{1}{4}$ inches; operations, turning, grinding, boring, milling, drilling and tapping; tolerance, .0005.

S.O. No. 288: Machining of 500 turret slides complete, deliveries, 75 per month. Operations, planing, gear cutting, milling, etc. Requires high-class shop experienced in work of this type.

New York office, Contract Distribution Branch of WPB, 122 East Forty-Second street, New York, reports the following subcontract opportunities:

S-72-3596: New York City manufacturer requires facilities to make steel castings, ¾, 1½ and 10 pounds, 22 inches long, 125,000 of each size. Cast horizontally, permanent molds, no core work.

S-72-5203: A procurement agency requires open time on one No. 49 Heald double or borematic or one No. 1 Heald single or borematic.

S-72-5208, 5209, 5210: Procurement agency requires facilities for Thomas flexible coupling for generator sets, battery generator pulleys, steel wrist pin, bushings, starter cables, ground cables, battery cables, ignition cable, water pump assembly for gasoline engine, Le Roi type fan pulley assembly for water pump impeller. Samples at New York office.

S-72-5227: Michigan manufacturer requires gear-working facilities. Materials furnished by subcontractor. Will award in lots of 50 to 2000 of each of six gears.

S-72-5240: Aircraft manufacturer seeks subcontract facilities having one No. 304 Barnes or equal honer with 26-inch stroke, cylinder diameter 2¾ to 4 inches.

S-72-5318: Buffalo prime contractor seeks thread-grinding facilities on steel studs 6 to 10 inches long, ¾ to 1½ inches diameter. Close tolerances.

Philadelphia Office, Contract Distribution Branch, Production Division, WPB, Broad Street Station building, reports the following subcontract opportunities:

Chase-51-1: New Jersey manufacturer requires indefinitely continued subcontracting facilities for machining aviation engine starter components of approximate dimensions as follows: Bearing ring, 3¾-inch diameter x ¼-inch long and ball race 4-inch diameter x ⅜-inch long, both high carbon, high chrome steel tubing; spline nut, 2½-inch diameter x 1½-inch length, nickel chrome steel; intermediate head, 3⅞-inch diameter x 4½-inch length; shaft screw, 2½-inch diameter x 5⅞-inch length; threaded sleeve, 2-inch diameter x 4⅞-inch length; spiral bevel gear, 27 teeth 10-pitch, 2/7-inch PD; splined shank, ⅞-inch diameter x $2\frac{33}{64}$-inch length. Latter four items of 5 per cent nickel carburizing steel. Subcontractor to furnish own materials. AA-1 priority. Tolerances medium and close precision. Quantities up to 1000 per month. Equipment or equivalent required, turret lathe, thread miller and grinder, No. 7 Gleason spiral gear generator, drill press and multi-spindle drill, broach, I.D., O.D. and surface grinders, milling machine, lapper. Prints and specifications at Philadelphia office.

Keefer-26-1: Pennsylvania manufacturer seeks subcontracting facilities on body for M-48 fuze. Material, WDX1314 cold-rolled steel. Tolerances, plus or minus .005. Quantity, 25,000 to 50,000 per week. Equipment, 2⅝-inch multi-spindle screw machine. Prints, specifications and sample at Philadelphia office.

Chase-22-3: Connecticut manufacturer requires indefinitely continued subcontracting facilities on aviation motor components, as follows: breather connection bodies, supercharger drain adapters, diffuser support studs, valve rocker shafts, exhaust valve washers, main crank case studs, long breather manifold screw, long hex. head screw, fillister head screw, oil manifold rocker screws and reduction drive pinion shaft, all of SAE 6150 steel; push rod ball ends of SAE 3115 steel and valve tappet rollers of AMS 6440 steel; rear blower shaft spacers of SAE 1035 steel; oil temperature control valve of AMS 5010 steel, and spring retainer button. Material largely bar stock. Tolerances, medium and close precision. Quantities, substantial of all items. Equipment or equivalent, screw machines, light milling machines, drilling, thread rolling, grinding. Prints and specifications at Philadelphia office.

Chicago office, Contract Distribution Branch of WPB, 20 North Wacker Drive, is seeking contractors for the following:

Display No. 74: Motor fittings, Material furnished by prime contractor. Five items, 2000 each, stainless steel, 1 x 1½ inches to 1 x 3 inches. Equipment required, turret lathes 1

and 1⅝-inch bar capacity, single-spindle automatic screw machine, 1-inch bar capacity. Minimum tolerances, .002 and .004.

Display No. 300: Pump fittings, five additional pieces. Material, cold-rolled steel and cast iron, furnished by prime. Three items, 20 pieces each, 3½ inches x 8 feet, 3 feet x 15 inches, 12 x 10½ inches. Equipment needed, heavy-duty engine lathe 14 x 102 inches, vertical milling machine, double-housing planer, horizontal boring mill, radial drill, single-spindle sensitive drill, plain horizontal shaper. Tolerance, .002 and .004.

Display No. 36: Cylinder fittings. Material, alloy steel and cast iron, furnished by prime. Three items, 60, 20 and 20 pieces. Equipment needed, radial drill, 48-inch arm; vertical boring mills, 62, 72 and 100-inch.

STRUCTURAL SHAPES . . .

SHAPE CONTRACTS PENDING

5000 tons, railroad bridge for Pennsylvania Lines over Potomac river at Washington; bids Dec. 1.

145 tons, viaduct, Franklin avenue, Erie, Pa.; bids to state highway department, Harrisburg, Pa., Nov. 25.

PLATES . . .

PLATE CONTRACTS PLACED

Unstated, steel caisson for Puget Sound Navy Yard, to Ames Shipbuilding & Dry Dock Co., Seattle.

PLATE CONTRACTS PENDING

Unstated, penstocks and tunnel, second Nisqually power project; bids to Tacoma, Nov. 9.

PIPE . . .

CAST PIPE PENDING

250 tons or more, 9380 feet cast iron pipe for Bremerton, Wash.; bids opened Nov. 19.

RAILS, CARS . . .

RAIL ORDERS PLACED

New York Central, 120,000 tons for 1943 requirements, divided among three producers; subject to War Production Board approval.

CAR ORDERS PENDING

Tennessee Valley Authority, 44 seventy-ton container gondola cars, bids asked.

BUSES BOOKED

Twin Coach Co., Kent, O.: Ten 32-passenger for New York State Railways, Utica, N. Y., nine 44-passenger for Jamaica Buses Inc., Jamaica, L. I.; nine 31-passenger for British Columbia Electric Railway, Vancouver, B. C.; five 27-passenger for Wisconsin Public Service Co., Green Bay, Wis.; three 32-passenger for Vancouver-Portland Bus Co., Portland, Oreg.; three 31-passenger for Syracuse Transit Corp., Syracuse, N. Y.; two 41-passenger for Southern Coach Lines, Nashville, Tenn.; two 29-passenger for Auto Interurban Co., Spokane, Wash.; two 44-passenger for Georgia Power Co., Atlanta, Ga.

CONSTRUCTION AND ENTERPRISE

OHIO

CLEVELAND—Ohio Aircraft Fixture Co., 4413 Train avenue, newly organized, will take over business operated during the past few months as a part of the American Coach & Body Co., 9503 Woodland avenue. The company will engage in light manufacturing, including airplane parts and jigs. Burdette P. Fortney is president.

CLEVELAND—Valley Mold & Iron Corp., reported Oct. 19 as establishing a plant here at 3900 East Ninety-first street, will start construction soon on 6800 square foot office building and 6500 square foot service building. W. J. Clark, purchasing agent, Hubbard, O., is in charge, but construction is to be handled through Christian, Schwarzenberg & Gaede, Cleveland engineers.

LISBON, O.—New construction and remodeling of the old plant of National Brass & Copper Co. for the Navy Department will be completed in 1943. Cost of expansion is estimated at $800,000.

MEDINA, O.—Filco Electric Motors Inc. is being formed by Dermond V. Fildes, manager of Filco Electric Motors, 145 West Bradway street, to manufacture, buy, sell and repair electric motors.

MASSACHUSETTS

QUINCY, MASS.—Bethlehem Steel Co., East Howard street, Quincy, will soon let contract for two-story plant addition and altering existing building.

CONNECTICUT

MILFORD, CONN.—Elliott Mfg. Co., 347 New Haven avenue, has plans nearing completion for two-story plant addition at 101 Gulf street. Estimated cost $40,000. L. F. Caproni, 1221 Chapel street, New Haven, Conn., engineer. (Noted Aug. 24).

NEW HAVEN, CONN.—Bristol National Corp., Waterbury, Conn., has plans by Douglas

Orr, 96 Grove street, New Haven, for altering four buildings here.

WATERBURY, CONN.—Owner, care of L. F. Caproni, engineer, 1221 Chapel street, New Haven, Conn., will soon take bids for factory addition costing over $40,000.

BRIDGEPORT, CONN.—Remington Arms Co. Inc., Barnum avenue, has taken bids for one-story building estimated to cost $45,000.

BRIDGEPORT, CONN.—United Illuminating Co., 1115 Broad street, has let contract for one-story turbine unit to Gellatly Construction Co., 25 Housatonic avenue. Estimated cost $43,500. Westcott & Mapes Inc., 139 Orange street, New Haven, Conn., engineer.

RHODE ISLAND

PAWTUCKET, R. I.—Joy Chemical Co., 133 Webster street, has let contract for altering plant to Elmer Thurber, Cottage street, R. C. Niebuhr, 10 Belmont street, architect.

NEW YORK

DUNKIRK, N. Y.—Alco Products Inc., Dunkirk, has let contract for one-story plant addition to Walter Kidde Constructors, 140 Cedar street, New York. Estimated cost $175,000.

NEW YORK—Defense Plant Corp. has executed contract with National Carbon Co. Inc., 30 East Forty-second street, to provide for plant facilities in North Carolina, to cost in excess of $500,000.

NEW JERSEY

PHILLIPSBURG, N. J.—Ingersoll-Rand Co., Phillipsburg, will spend about $40,000 for alterations at plant.

WEST LINDEN, N. J.—Eastern Aircraft Division of General Motors Corp., Edgar road, plans erection of plant costing about $50,000.

PENNSYLVANIA

BEAVER, PA.—Defense Plant Corp. has authorized an addition to manufacturing plant here to cost between $100,000 and $500,000. Lessee and operator, Curtiss-Wright Corp., O. W. Nelson, plant manager, Beaver. Albert H. Kahn Inc., 345 New Center building, Detroit, architects and engineers.

EAST BUTLER, PA.—Preliminary plans are in progress for rebuilding factory here for Pittsburgh Drum Co., Oliver building, Pittsburgh.

MICHIGAN

DETROIT—Briggs Mfg. Co. has awarded contract to W. E. Wood Co. for an addition to its plant at 11631 Mack avenue. Estimated cost over $25,000.

DETROIT—Malcomson, Calder & Hammond, architects, are preparing plans for alterations to building at 1219 Griswold street and construction of plant at 3311 Dunn road for Aluminum Co. of America.

DETROIT—Silberstein Construction Co., Detroit, has been awarded contract for addition and alterations to factory building at 197 South Waterman, at estimated cost of $21,000.

DETROIT—Lewiston Tool & Engineering Co., 258 East Vernor highway, has been incorporated to deal in mechanical devices, by Robert R. Lewiston, 3283 Clements street.

ILLINOIS

EAST PEORIA, ILL.—Caterpillar Tractor Co. plans additional plant facilities costing over $400,000. Defense Plant Corp. will finance improvements.

ELGIN, ILL.—United States War Department will soon award contracts for several factory additions to be operated by Burgess-Norton Mfg. Co., Geneva, Ill.

MOUNT VERNON, ILL.—War Department through United States engineer's office, St. Louis, has awarded contract for sewage disposal plant here, to Brockmeyer Construction Co., 634 North Grand boulevard, St. Louis.

INDIANA

ELWOOD, IND.—Muncie Elwood Lamp Co. and Elwood Industrial Bureau plan to spend $40,000 for rebuilding factory and installing equipment.

MARYLAND

BALTIMORE—Consolidated Engineering Co., 20 East Franklin street, has contract for alteration to warehouse, 4500 East Lombard street for Maryland Sanitary Mfg. Co.

BALTIMORE—Liberty Motors & Engineering Corp., Park avenue and Preston street, will build addition containing 15,000 square feet of floor space. The company was organized last spring to manufacture airplane parts.

BALTIMORE—Standard Cap & Moulding Co. Inc., 307 South Eaton street, maker of plastic molded screw caps, has awarded contract for erection of addition containing 5000 square feet.

BALTIMORE—United States Industrial Chemicals Inc., is erecting a $1,000,000 processing plant on its Curtis Bay property. Work is being financed through Defense Plant Corp.

BALTIMORE—Glenn L. Martin Co. is building a one-story storage building at its Middle River plant.

BALTIMORE—L. & S. Welding Co., 2401 Homewood avenue, is erecting one-story plant addition.

KENTUCKY

LORETTO, KY.—Defense Plant Corp. has executed contract with Hirsch Distilling Co., Loretto, to provide equipment for plant in Kentucky.

TENNESSEE

McKENZIE, TENN.—McKenzie Milling Co. is rebuilding mill at cost of approximately $100,000.

LOUISIANA

EOLA, LA.—Southern Carbon Co., 605 Ouachita building, Monroe, La., plans furnace-type plant costing approximately $500,000.

MONROE, LA.—S. H. Aulds, Monroe, has let contract to John R. White, Monroe, for steel factory. S. Smith, Monroe, architect.

NEW ORLEANS—Defense Plant Corp. has authorized contract to Higgins Industries Inc. to provide machinery and equipment in plant in Louisiana, to cost in excess of $600,000.

MISSOURI

KANSAS CITY, MO.—Aluminum Co. of America, Pittsburgh, will operate plant in Blue Valley for manufacture of cylinder heads for airplane motors.

OKLAHOMA

OKLAHOMA CITY, OKLA.—Boardman Co., tank manufacturer, plans construction of one and two-story factory to cost about $60,000.

WISCONSIN

ALGOMA, WIS.—Algoma Plywood & Veneer Co. has given contract to Thomsen-Abbott Construction Co., Marshfield, Wis., for addition to veneer plant.

GREEN BAY, WIS.—H. J. Nelson Machine Co. has begun construction of one-story machine shop addition.

GREEN BAY, WIS.—Green Bay Drop Forge Co. has given general contract to Selmer Co. for one-story factory addition. Harry W. Williams is architect.

GREEN BAY, WIS.—Green Bay Box Co. has awarded contract to Selmer Co. for one-story factory addition. Harry W. Williams, architect.

KENOSHA, WIS.—Peacock Corp., Berryville road, has given contract for one-story dehydrating plant to K. Klemm, 7203 Twenty-second avenue.

LA CROSSE, WIS.—Chicago, Milwaukee, St. Paul & Pacific Railway Co., E. W. Blomgren, division engineer, La Crosse, has awarded general contract to Hugh Davey & Son, Mason City, Iowa, for water treating plants at La Crosse and New Lisbon, Wis., to cost about $30,000 each.

MILWAUKEE—Industrial company has award-

ed contract for one-story building to Hunzinger Construction Co., Station K, Milwaukee. Estimated cost $500,000.

MILWAUKEE—Air Reduction Co. Inc., 3435 North Buffum street, has awarded construction and electrical contracts for one-story machine shop and storage building to F. H. McGraw & Co., 780 Windsor street, Hartford, Conn.

MILWAUKEE—Chain Belt Co., 1600 West Bruce street, has given contract for two-story building to Klug & Smith Co., 111 East Wisconsin avenue. Eschweiler & Eschweiler, 720 East Mason street, Milwaukee, architects.

RACINE, WIS.—Belle City Mfg. Co., 1717 Taylor avenue, has given contract for one-story blacksmith shop addition to Nelson & Co. Inc., 1550 Yont street. E. A. Klinger, 612 Fourteenth avenue, architect.

WAUKESHA, WIS.—Waukesha Foundry Co. has started construction of one-story foundry addition. R. H. Bierman, 3402 West Thurston avenue, Milwaukee, architect.

WEST ALLIS, WIS.—Murphy Diesel Co. has given contract to William H. Roberts & Son for one-story factory addition.

MINNESOTA

MINNEAPOLIS—Defense Plant Corp., Washington, has awarded contract to H. K. Ferguson Co., Hanna building, Cleveland, for tin can shredding plant here to cost $100,000.

MINNEAPOLIS—Rosco Mfg. Co. has given contract to Peterson Bros., 5215 Logan avenue South, for one-story factory addition.

ST. PAUL—Auto Engine Works, J. D. Mooney, president, has let general contract to Madsen Construction Co., 1790 Lyndale avenue South, Minneapolis, for one and two-story factory addition to cost $75,000. Larson & McLaren, 1901 Foshay Tower, Minneapolis, architects.

ST. PAUL—E. B. Sewall Mfg. Co. is having plans prepared for one-story factory addition by Carl H. Buetow, 570 North Snelling avenue, architect.

ST. PAUL—E. W. Wylie Inc. has given contract to Frank Carlson, 1515 North Hamline avenue, for two-story machine shop addition.

TEXAS

BEAUMONT, TEX.—Oil City Brass Works has awarded subcontracts for brass foundry, machine shop and office building at Neches and Crockett streets. Estimated cost $70,000. C. Sargl, 202 Liberty building, general contractor.

FORT WORTH, TEX.—Defense Plant Corp. will erect $2,500,000 plant for manufacture of liquid catalyst used in making high test aviation gasoline. Plant will be operated by American Cyanamid & Chemical Corp.

SWEENEY, TEX.—J. S. Abercrombie Co., Gulf building, Houston, has awarded contract for several miscellaneous types of buildings to Benson-Marxen Co., 2006 West Alabama avenue, Houston. Estimated cost $100,000.

VELASCO, TEX.—Defense Plant Corp. will erect $2,500,000 thiokol plant near Velasco Heights, for Rubber Reserve Co.

NEBRASKA

LINCOLN, NEBR.—National Mfg. Co. Inc., maker of special machinery and parts, has been given permit for one-story machine shop addition.

IOWA

SCOTT COUNTY, IOWA—War Department through United States Engineer's Office, Rock Island, Ill., has let contract for boiler house here to J. H. Hunzinger & Co., Security building, Davenport, Iowa, and for post utilities shops in Clinton County, Iowa, to the same contractor.

MONTANA

TROY, MONT.—Thornton Zinc & Lead Reduction Works plans to rebuild zinc plant recently destroyed by fire.

CALIFORNIA

EMERYVILLE, CALIF.—Judson-Pacific Iron Works, foot of Park avenue, has let contract for remodeling plant to Louis C. Dunn Inc., 799 Monadnock building, San Francisco. Estimated cost $40,000. Irvin Subway Grating Co. Inc., western division, J. C. Lynn, general manager, lessee.

LOS ANGELES—Defense Plant Corp. executed contract with Bechtel-McCone-Parsons Corp., Los Angeles, for construction and equipment of plant in Alabama, to cost over $12,500,000.

LOS ANGELES—Hughes Aircraft Co. is erecting an engineering and mold loft building at Jefferson boulevard and Florence avenue, costing $250,000.

CANADA

BROCKVILLE, ONT.—Canada Foundries & Forgings Ltd., Water street, has plans and will let contracts soon for plant addition to cost about $25,000 with equipment.

CHATHAM, ONT.—Chrysler Corp. of Canada Ltd., 300 Tecumseh boulevard, Windsor, has plans for addition to plant here to cost about $15,000. Bids will be taken immediately.

MALTON, ONT.—National Steel Car Corp. Ltd., Kenilworth avenue, Hamilton, has extended contract to Tope Construction Co. Ltd., 677 Main street West, Hamilton, to include extension to aircraft assembly building here to cost about $10,000. N. Wagner is chief engineer.

SAULT STE. MARIE, ONT.—Algoma Steel Corp. Ltd., 503 Queen street, will let contract soon for repairs to three open-hearth furnaces to cost about $50,000.

THOROLD, ONT.—Exolon Co. has plans and will start work soon on addition and alterations to furnace room and silicon carbide furnace plant. Estimated cost about $15,000 with equipment.

TORONTO, ONT.—Sutton-Horsley Co. Ltd., 263 Adelaide street West, will let contract soon for plant addition at 30 Commercial street to cost about $105,000 with equipment.

TORONTO, ONT.—Gair Co. of Canada Ltd., 475 Commissioner street, G. W. Brown, president, has given general contract to Russell Construction Co. Ltd., Harbor Commission building, for plant addition to cost about $20,000 with equipment.

TORONTO, ONT.—Dominion Wheel & Foundries Ltd., 171 Eastern avenue, J. A. Kirkpatrick, president, is having plans prepared by James, Proctor & Redfern, engineers, 36 Toronto street, for two-story plant addition to cost about $20,000, equipment extra.

TORONTO, ONT.—United Steel Corp., 53 Pelham avenue, has extended contract to William Edwards, 337 Rusholme road, to include one-story addition to plant, to cost about $20,000 with equipment.

TRENTON, ONT.—Department of Munitions and Supply, Ottawa, H. H. Turnbull, secretary, has given general contract to Frontenac Construction Co. Ltd., 704 C.P.R. building, Toronto, for addition to workshop to cost about $25,000, equipment extra.

WELLAND, ONT.—Canada Foundries & Forgings Ltd., Empire street, has given general contract to Gradner Construction Co. Ltd., 7 Riverbank, for plant addition here to cost about $15,000 with equipment.

MONTREAL, QUE.—Montreal Armature Works Ltd., 276 Shannon street, plans to start work soon and let number of subcontracts in connection with plant addition to cost about $25,000 with equipment. A. F. Byers Construction Co. Ltd., 1226 University street, has general contract.

MONTREAL, QUE.—Canadian Car & Foundry Co. Ltd., 621 Craig street West, will start work immediately on further large additions to plants at the Turcot Propeller Division and at the Longue Pointe Works. The Turcot addition will cost about $75,000, while the proposed Longue Pointe addition will cost in excess of $100,000 with equipment. Spence & Burge, 2063 Union avenue, architects.

MONTREAL, QUE.—Canadian Pratt & Whitney Aircraft Co. Ltd., Lorne avenue, Longueuil, is receiving bids through H. H. Turnbull, secretary, Department of Munitions and Supply, Ottawa, for plant addition to cost about $250,000 with equipment.

QUEBEC, QUE.—Department of Munitions and Supply, Ottawa, H. H. Turnbull, secretary, has given general contract to Magloire Couchon Ltd., 311 de la Salle street, for addition to Dominion Arsenal here to cost about $50,000 with equipment.

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