Kaiser Co.'s California blast furnace lighted, first unit in $83,000,000 steel plant

CONTENTS

Volume 112—No. 2 STEEL January 11, 1943

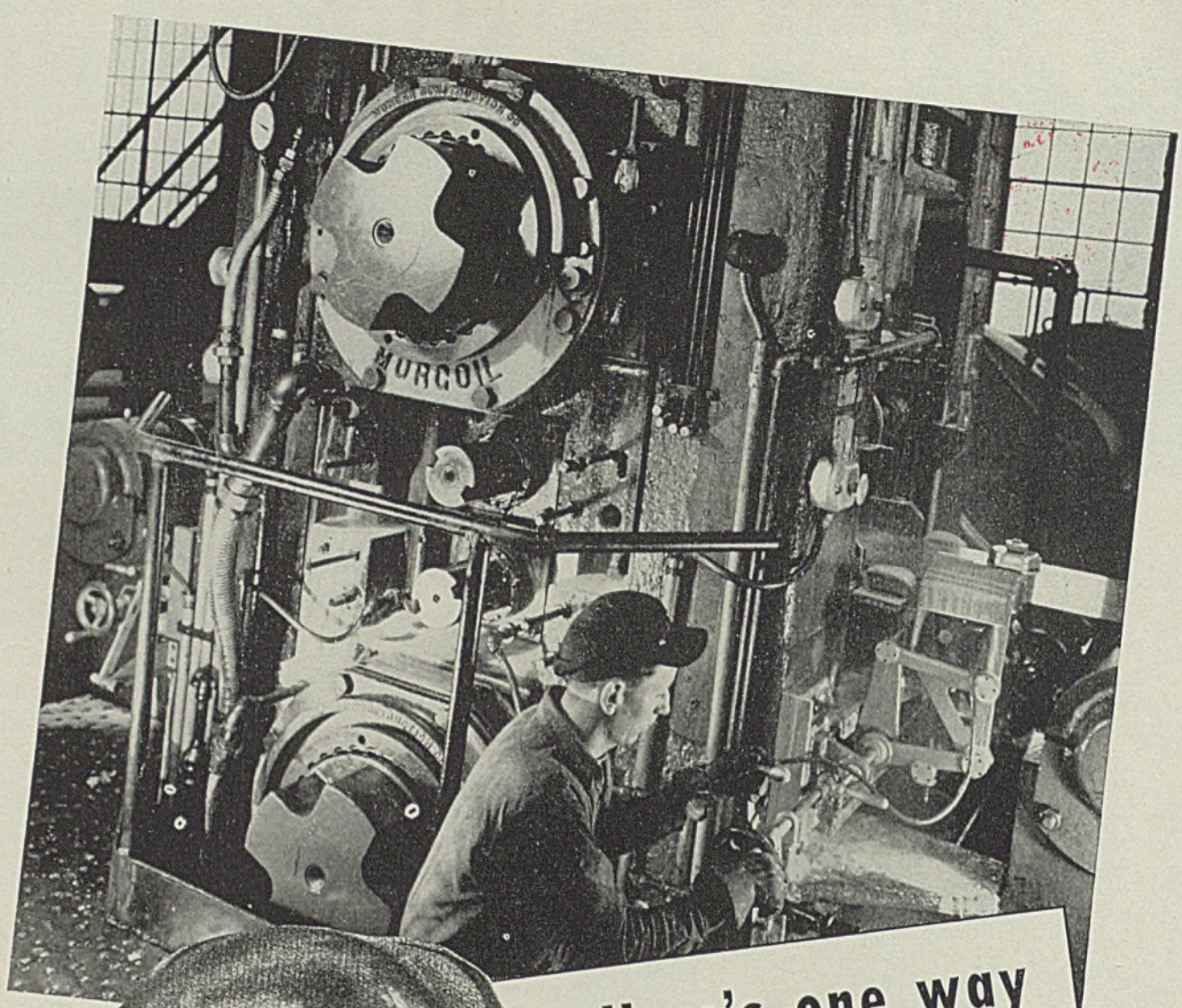
NEWS

FEATURES

TECHNICAL

PRODUCTION

MARKETS



Here's one way to pinch the Axis!

"We got a big Pincers Movement right here: hundreds of tons riding along on a film of oil no thicker than this sheet of paper!

"You know, there's an idea there! War's a pretty big thing, but it's won by having a lot of little things working right, like these Morgoils. Take my job: I watch gauges and turn valves and press buttons that keep this mill rolling steel fast!

"Maybe it's a little job, and maybe it ain't!"

R-108

MORGAN CONSTRUCTION COMPANY • WORCESTER, MASS.

HIGHLIGHTING

this issue of STEEL

POST-WAR PLANS Industry will devote maximum production capacity to making the implements necessary for war this year and as long after as necessary, but increasing attention is being given to post-war planning (p. 22). A Committee for Economic Development, independent of the government and of other business groups, has been organized to assure a satisfactory level of employment after hostilities end. The committee estimates jobs must be provided for 50,000,000, or 9,000,000 more than were employed in 1940. To support this many workers, the country must produce and sell $135,000,000,000 to $150,000,000,000 output annually.

NEW FACILITIES Completion of the steel expansion program in midyear will raise ingot capacity to 97,115,000 tons, about twice that of the Axis (p. 48). At full operations, these plants will require 123,000,000 tons of iron ore annually, 88,000,000 tons of coal and 27,000,000 tons of limestone. This year's requirements for ore from the Lake Superior district alone will be 100,000,000 tons, a fact which led lake shippers to protest (p. 46) to the War Labor Board against endangering the efficiency of the lake fleet by imposing the hiring hall. . . First unit in Kaiser Co.'s integrated West Coast steel plant, a 1200-ton blast furnace, has been blown in (p. 51). . . Defense Plant Corp. continues to authorize large sums (p. 51) for various war plants, expansions and new equipment.

TECHNICAL L. F. Dytrt shows (p. 56) how steel-clad switchgear designs cut copper required to almost one-fifth of that needed for conventional open-type frame-mounted assembly of switchgear equipment. . . Wendell E. Whipp relates experience of Monarch Machine Tool Co. with women employes in manufacture of machine tools (p. 58). He reports women now operate all types of machines except planers, heavy turret chucking lathes and similar heavy units but says they would not hesitate to assign women to these if the need arises.

S. L. Widrig details experience with NE steels as successfully employed in gears for heavy duty automotive transmissions by Spicer Mfg. Co., Toledo, O., (p. 60). This is the seventh in STEEL's new series on reports of users of NE steels. Mr. Widrig describes an unusually effective clash-test setup for gears and says NE steels appear suitable for use in such products as heavy duty gears.

J. A. Neumann presents a discussion of steel alloying in the electric welding arc (p. 74) and shows how alloy steel can be conserved by producing and depositing it as weld metal at the exact point of use. His analysis includes much information on the operation of the shielded electric arc and the metallurgy of the reactions that take place in it.

J. D. Knox, steel plant editor, relates the story of a successful machine for briquetting feed and charge ores (p. 82). This equipment has interesting possibilities as a help in obtaining the 10,000,000 tons of charge ore that must be made available if we are to fully utilize the 100,000,000-ton capacity for making steel that will soon be available in this country.

A new method for recovering copper by deplating it rfom iron and steel scrap permits approximately 100 per cent recovery of anode copper—an important war material.

IN THE NEWS Companies holding war contracts totaling less than $500,000 annually may be exempted (p. 37) from the necessity for renegotiation.

Steel warehouses will be permitted to replenish their inventories (p. 36) by exceeding their first quarter quotas if they did not receive all the material to which they were entitled last year.

Merchant shipbuilding soon will reach a rate of five a day (p. 24), due to more extensive use of prefabrication and better materials supply.

Accessories on military vehicles are being standardized (p. 39) in the interest of simplifying service problems in the field.

Consumers goods production will be reduced 15 to 20 per cent this year over last (p. 25), with durable goods suffering the greatest curtailment.

Salvage of dormant scrap from industrial sources will be carried on for the duration by a country-wide organization of steel warehouse salesmen, working with War Production Board agencies (p. 45).

SOUTH AMERICA An important and eager market awaits United States manufacturers in the countries to the south (p. 32) after the emergency is over. Latin Americans are accumulating many United States dollars as result of their favorable balance in trade and are anxious to spend them for our manufactures when materials can be spared here from the war effort. Some companies already are planning organizations to serve this post-war outlet for all kinds of construction materials, engineering services and many manufactured products.

Inland Reports on Its First Year at War

AMERICAN INDUSTRY is all-out for Victory—has performed production feats that would have seemed impossible before Pearl Harbor. But we all know that the *real* accomplishments—ones that make ours worthwhile—are those of our men on the fighting fronts.

It is therefore humbly, and with full realization of this, that we report on what we have done—putting every ounce of skill and energy into backing up the men who fight for us!

1942 OUTPUT AT 102% OF CAPACITY. Inland maintained its production of "fighting steel" at about 102% of rated capacity during 1942, despite lack of an adequate supply of suitable scrap and the loss of hundreds of skilled workmen entering the armed services.

BREAK OVER 50 PRODUCTION RECORDS. More than 50 Inland production records have fallen since Pearl Harbor!

★ Open Hearth steelmakers in March had their best month in history.

★ The Blast Furnace Department hit its all-time production peak in the month of December.

★ Near the end of July the 76-in. mill finished enough ship plate in one 24-hour period for the hulls of two Liberty ships. All our mills rolling ship plate turned out enough in July for 34 Liberty ships—nearly half the number sent down the ways that month.

★ —And so on in other departments throughout the mills. Inland steelmakers are determined that our fighting men will not suffer for lack of steel they can supply.

★ Inland mines and quarries produced far more iron ore, coal and limestone than ever before.

★ Lake freighters in the Inland fleet broke their own cargo records, not once but several times in 1942.

EXPAND AND MODERNIZE FACILITIES. Not only has top production of steel with installed facilities been maintained, but we completed 27 major expansion and modernization projects to get even greater tonnage.

★ Inland's new No. 6 blast furnace, first one built in the Chicago area since Pearl Harbor, was blown in Nov. 16 and now is pouring out 1200 tons of pig iron a day.

★ We soon will complete construction of and begin operating two more blast furnaces for the Defense Plant Corp.

★ A new electrolytic tin plate plant will soon be in operation to conserve our precious stock of tin.

★ New ore mining expansion assures a larger supply of iron ore.

HELP TRANSPORTATION OF WAR GOODS. Reduced customer unloading costs 75%—improved packaging saved 40% of space—increased weights of carloading 36%—lowered car detention time 20%.

GETS IN THE SCRAP. Inland contributed heavily to the American Industries scrap campaign, conducted its own extensive scrap advertising campaign, and Inland salesmen are participating actively in the steel companies' industrial scrap drive.

EMPLOYEES ALL-OUT FOR VICTORY. More than 2,500 Inland workers have entered the armed services.

★ If medals were awarded to workers in war industries for effort "above and beyond duty," many men at Inland would qualify to receive them.

★ Women are helping carry on at the plant, too—doing a variety of jobs in the mills to help relieve the manpower shortage and maintain capacity output of steel.

★ The entire Chicago Heights plant and many departments at Indiana Harbor already are over the top in the current drive to put 10% of total pay into war bonds.

★ Inland girls have their own Red Cross group—making thousands of bandages. Nutrition groups are endeavoring to improve the general health of workers and fit them to contribute more to the war effort.

★ Many Inland employees are in the plants' own well-trained Catastrophe Organization, ready to meet any wartime emergency. Others are busy in civilian defense work, war group benefits, etc., and are sharing their cars, donating their blood and tightening their belts to do whatever else is necessary to win this war.

LOOKING AHEAD. As to the coming year, Inland and its men will continue to push the production of "fighting steel" at top speed. Rather than make predictions, we prefer to let production records speak for themselves. We know that we can pledge the whole-hearted support of every worker to all-out effort until Victory is won!

INLAND STEEL COMPANY

38 S. DEARBORN ST. • CHICAGO, ILL.

STEEL
January 11, 1943

Don't Cheer Prematurely!

As events of the new year unfold and as the seventy-eighth "Victory" Congress gets underway, signs point to a somewhat improved position for American business in the esteem of the public.

This slightly more favorable status can be attributed to several factors. Foremost is the record industry has made in the war effort. Throughout 1942, industrialists put their hearts into the job of production, achieved gratifying results against numerous handicaps and didn't squawk too much about the injustices under which they operated. For all of this, they are receiving a higher rating from the public than they have enjoyed in many years.

A second factor is the attitude of Washington toward industry. The exigencies of war have brought many high-class industrialists into contact with administration officials of all shades of political and economic beliefs. The relationship has caused many anti-business theorists to entertain a more wholesome respect for private enterprise. One hears one-time left wingers confessing that private enterprise "gets things done" and that the government as an administrator has definite limitations.

A third factor is the make-up of the seventy-eighth Congress. It is likely to be more sympathetic than its recent predecessors to the things industry believes are desirable.

All of these favorable signs are encouraging. Undoubtedly the tide of unreserved resentment against industry has turned. But this fact should not cause industrialists to crowd their good fortune. This is not the time to celebrate or to gloat; it is a time to remain humble, to restrain one's elation and to work hard for additional gains.

Henceforth, those who speak for industry may find it advantageous to put the major emphasis on constructive ideas. More of the "American industry proposes to do this or that" and less of the "Industry condemns the practice of this or that as unAmerican" would seem to be the proper prescription.

E. L. Shaner

Editor-in-Chief

Jobs for 55,000,000 Aim of Businessmen's Committee

Government and industry giving attention to re-employment of service men and war workers after hostilities end. Will require national income of from 135 to 150 billion dollars

WITHOUT relaxing the drive for increased munitions production this year and for as long after as may be necessary, business and government leaders are giving considerable thought to post-war planning.

In Washington last week, it was anticipated that President Roosevelt would devote a considerable portion of his annual message to Congress on this subject. Much of this anticipation was engendered by the trial balloons sent up recently by Vice President Wallace and others.

Actually, the Chief Executive referred to post-war plans in only the most general terms. He said that all United Nations wanted a "decent peace and a durable peace". He added that our fighting men want not only a lasting peace but permanent employment for themselves, their families and neighbors when they are mustered out.

The people on the home front, he declared, do not want a post-war America suffering from under-nourishment, slums or the dole. The young men and women of this country want assurances "against evils of all major economic hazards—assurance that will extend from the cradle to the grave".

Mr. Roosevelt gave no particulars on any new social security legislation. He said he had been advised it was no time to speak of a better America after the war and that it was a grave error for him to do so.

Would Win the Peace

Business leaders were not so cautious in dealing with post-war planning, especially as regards easing the shock of peace by providing jobs for returning service men and for war workers whose products no longer will be in great demand. Most notable declaration in the matter was the statement of the recently organized Committee for Economic Development, an independent group of businessmen dedicated to maintaining employment after hostilities end.

The group, while co-operating with all government agencies, emphasizes its independence of those agencies, and of other associations of businessmen. Thus it starts with a clean slate, unfettered by the past thinking or records of those organizations.

Chairman of the committee is Paul G. Hoffman, president of Studebaker Corp., who keynoted the group's purpose:

"The war has and will continue to get AAA priorities, but the job of winning the peace will not be neglected. For business that means planning to create jobs for returning soldiers, sailors and war workers."

This, in the committee's opinion, means providing work for approximately 55,000,000 people, 9,000,000 more than were employed in 1940.

To attain this goal means the United States must produce and sell an annual output of $135,000,000,000 to $150,000,000,000, or 35 to 50 per cent more than the 1940 amount of $100,000,000,000 of goods and services.

Parallels British Program

The desired objective can be reached only, the committee holds, if businessmen start to make post-war plans now and, if an environment favorable to business enterprise is provided.

Formation of the committee and the statement of its program resembles in many respects the action taken recently by a group of 120 leading British industrialists in defining their post-war program (STEEL, Dec. 21, p. 34), accepting certain social obligations and admitting a three-fold responsibility to the public, labor and investors.

Need for post-war planning also has been recognized by a number of American industrialists individually. Some already have departments at work on the problem, attempting to draw a workable blueprint for the new peace era. Meanwhile they are keeping full productive strength on war work.

These leaders envisage the coming of peace as a new chapter of industrial enterprise in which they voluntarily will accept more social responsibilities than in the past. They also see it as a period of development for peacetime purposes of the new products, new methods, the new and synthetic materials and the new uses for old materials that have been stimulated by the necessities of war.

The conversion back to peacetime products to fill the reservoir of accumulated civilian demand will require an amount of research probably comparable to that required to prepare for war.

The Committee for Economic Development has made provision for such a research program and a field campaign for mobilizing advance community preparations already has been launched.

The idea of establishing the committee started several months ago when Jesse H. Jones, secretary of commerce, called together a group of businessmen and suggested that a group be organized to help commerce and industry to meet the problems with which the nation's economy would be confronted when hostilities cease. Out of that proposal came the committee.

The committee, however, is separately incorporated and privately financed by business; its board is self-perpetuating and elects its own successor.

Carroll L. Wilson, formerly director of the Bureau of Foreign and Domestic Commerce, has taken a leave of absence to serve as the committee's executive secretary.

Mr. Hoffman outlined two major tasks to be undertaken: Research on basic problems of the post-war economy; and stimulation of local business groups in each community to start canvassing their post-war possibilities now.

Local leaders have been named and groups affiliated with the Committee for Economic Development are functioning in three communities: Peoria, Ill.; Wheeling, W. Va.; and Reading, Pa. The experience in these communities will help formulate the national program.

Seek Maximum Productivity

"The committee," said Mr. Hoffman, "in no sense will attempt overall national planning. This is an effort by businessmen to stimulate maximum productivity and high employment after the war. The success which business will have in providing a high volume of employment depends in part on conditions beyond its control. This fact, however, does not relieve any businessman of the responsibility for exerting his own maximum effort to create and maintain as many real jobs as possible."

The committee's board of trustees follows:

William Benton, vice president, University of Chicago, Chicago, vice chairman of the board; Will Clayton, industrialist and merchant, Houston, Tex.; Chester C. Davis, president, Federal Reserve Bank of St. Louis; Ralph E. Flanders, president, Jones & Lamson Ma-

chine Co., Springfield, Vt.; Marion B. Folsom, treasurer, Eastman Kodak Co., Rochester, N. Y.; Clarence Francis, president, General Foods Corp., New York; Mr. Hoffman, chairman of the board; Lou Holland, president, Holland Engraving Co., Kansas City, and director, Smaller War Plants Division of WPB; Charles R. Hook, president, American Rolling Mill Co., Middletown, O.

Regan Houston, an industrialist and merchant, San Antonio, Tex.; Jay C. Hormel, president, George A. Hormel & Co., Austin, Minn.; Eric A. Johnston, president, Brown-Johnston Co., Spokane, Wash., and president, United States Chamber of Commerce; Harrison Jones, chairman, Coca-Cola Co., Atlanta, Ga.; Charles F. Kettering, vice president, General Motors Corp., Detroit; Thomas B. McCabe, president, Scott Paper Co., Philadelphia; Reuben R. Robertson, executive vice president, Champion Paper & Fibre Co., Canton, N. C.; Harry Scherman, president, Book-of-the-Month Club, New York, and John Stuart, chairman, Quaker Oats Co., Chicago.

Flanders Heads Research

The committee's research committee, with Mr. Flanders as chairman, includes Mr. Davis as vice chairman; William L. Batt, president, SKF Industries, Philadelphia; S. Bayard Colgate, chairman, Colgate-Palmolive-Peet Co., Jersey City, N. J., formerly chairman of the committee on postwar problems of the National Association of Manufacturers; Donald David, dean, Graduate School of Business Administration, Harvard University, Cambridge, Mass.; Max Epstein, chairman, General American Transportation Co., Chicago; Mr. Johnston; Thomas W. Lamont, J. P. Morgan & Co., New York; Beardsley Ruml, treasurer, R. H. Macy Co., New York. Mr. Hoffman and Mr. Benton are ex-officio members of this and other committees.

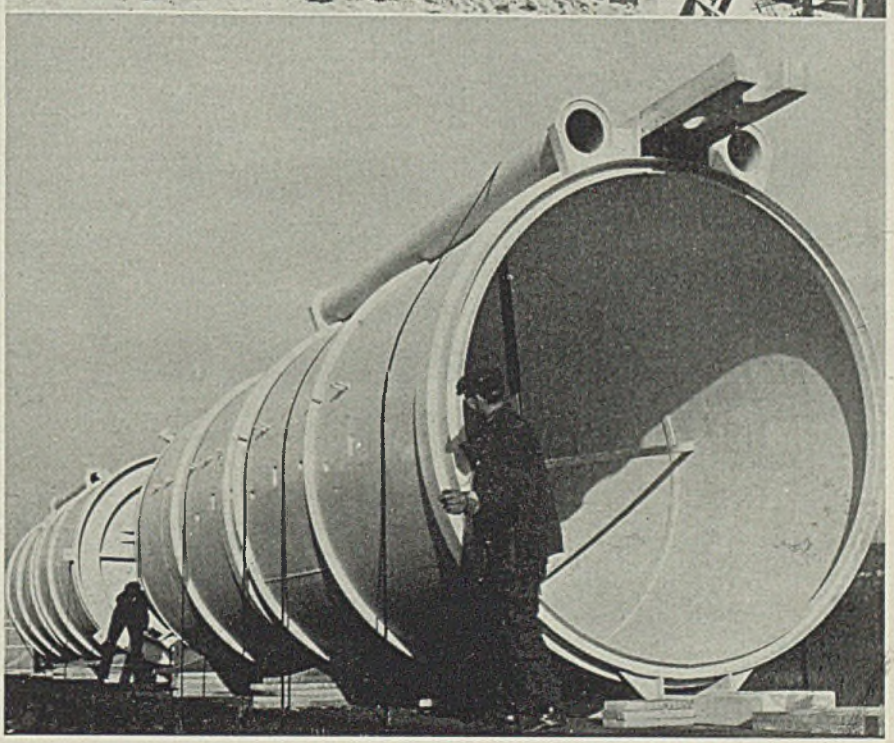
A research advisory board of social scientists has been retained. Its members: Prof. Sumner Slichter, Harvard University, chairman; Dean Robert Calkins, School of Business, Columbia University, New York; Prof. Neil H. Jacoby, secretary, University of Chicago; Harold Lasswell, director of war communications research of the Library of Congress; William I. Myers, head of the Department of Agricultural Economics, Cornell University, Ithaca, N. Y.; Theodore W. Schultz, head of the Department of Economics, Iowa State College, Ames, Iowa; Ralph Young, professor of economics, University of Pennsylvania, Philadelphia.

Prof. Theodore Yntema, University of Chicago economist, has taken leave of absence to serve as the committee's full-time research director.

The program for stimulating post-war planning by local communities and individual businesses is headed by Mr. Folsom, chairman of the field development committee. This group will consist of 12 regional chairmen, one for each Federal Reserve district. Regional chair-

—o—

FOR PEACE, OR WAR



GOVERNMENT continues to supply spectacular photos of work at great western dams, with dramatic captions. Above—"pointing like huge guns from a fort etc."—are these two of the five penstocks which will generate 375,000 kilowatts of electric power at Shasta dam. "The power will go largely to war industries in the San Francisco bay region."

Below, shells of heat treating furnaces being made at Pittsburgh, which may be used either in the arts of peace, or war. Primarily they are intended for tempering gun barrels. The shells will be lined with brick and equipped with heating elements

men thus far appointed are: John Stewart Bryan, newspaper publisher, Richmond, Va.; Ralph Budd, president, Chicago, Burlington & Quincy railroad, Chicago; George Crabbs, chairman of Philip Carey Mfg. Co., Cincinnati; Walter D. Fuller, president, Curtis Publishing Co., Philadelphia; Harold W. Sweatt, president, Minneapolis Honeywell Regulator Co., Minneapolis; Henry P. Kendall, president, Kendall Co., Boston; E. L. Kurth, industrialist, Lufkin, Tex.; Frank Rand, chairman, International Shoe Co., St. Louis; George Sloan, industrialist, New York; Grant Stauffer, president, Sinclair Coal Co., Kansas City; and H. Carl Wolf, president, Atlanta Gas Light Co., Atlanta.

David C. Prince, vice president, General Electric Co., is chairman of the field development industrial advisory board; Pyke Johnson, president, Automotive Safety Foundation, is vice manager.

C. Scott Fletcher, sales manager, Studebaker Corp., is on leave of absence to serve as field director for the field development division of all committee.

District chairmen will be selected, one for every million of population, and they will constitute, with the board of trustees and the various committees, the Committee for Economic Development. Chairmen for all principal towns and cities in the various trading areas of the nation also will be appointed. Through this local community approach the committee hopes to help the nation's small business men make their maximum contribution to re-employment.

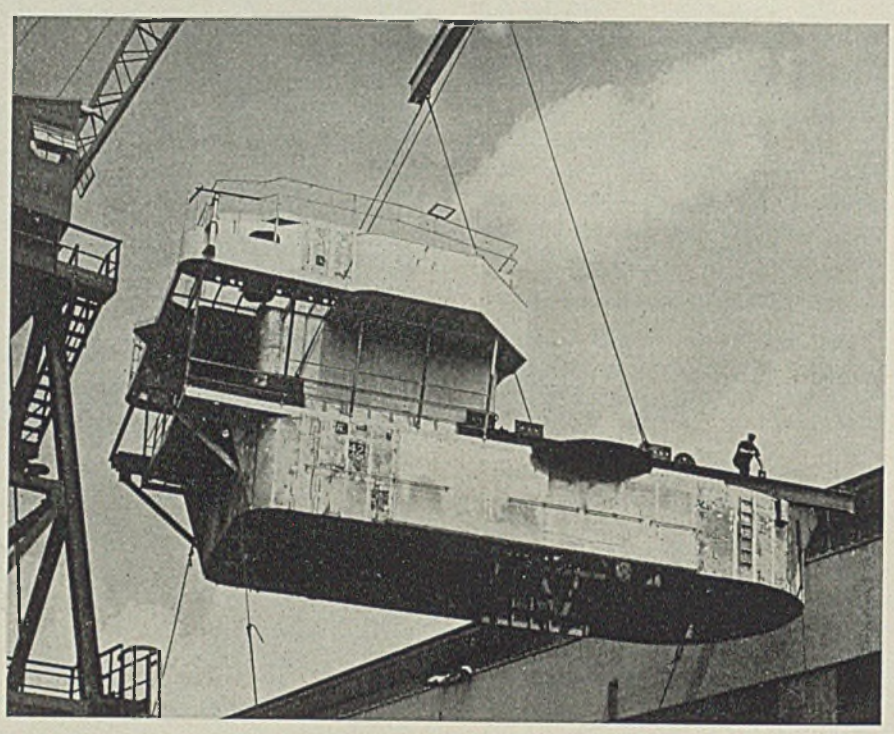
PREFABRICATION ENABLING SHIPYARDS TO SET ASTOUNDING RECORDS

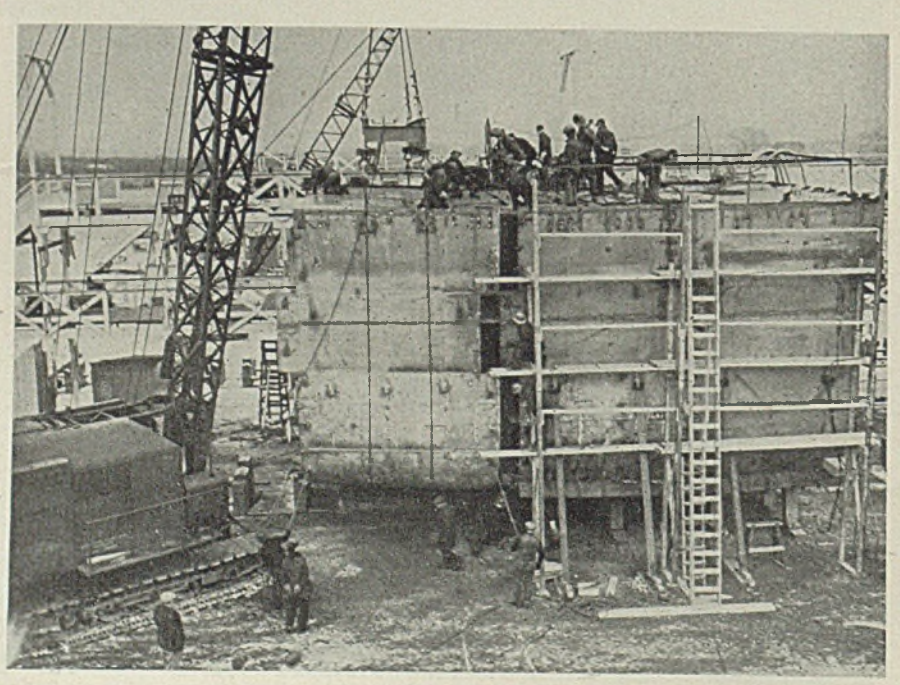
MERCHANT ship launchings soon will reach a rate of five a day, and during the year will practicaliy double last year's record of more than 8,000,000 tons, according to shipbuilding and administration officials.

Cargo vessels at year's end were being launched at the rate of four per day.

Naval ship construction also is being accelerated and even now many units are being delivered months ahead of schedule.

The tremendous reduction in building time, according to H. Gerrish Smith, president of the National Council of American Shipbuilders, New York, is made possible by improved techniques and by the drive of plants and workers forging the materials of war. Shipbuilding, which last year became the steel industry's No. 1 customer by taking about 20 per cent of the total production, will absorb a much larger percentage this year.





More extensive subassembly methods will help United States shipyards break all construction records this year. Examples: Prefabricated deck house of a destroyer, above, is hoisted onto a waiting hull at yards of Federal Shipbuilding & Dry Dock Co., Kearny, N. J., to be welded in place. The section is 60 feet long. 30 feet wide and high and weighs 42 tons. At left is shown two sections of a naval patrol vessel being fitted together in a new type of assembly line in a plant near Chicago. Sections of the vessels are built in widely scattered plants and brought to the launching ways

Output To Be Cut 15-20% in 1943; Purchases To Fall More Moderately

PURCHASE of consumer goods and services by civilians in 1943 is expected to drop 10 to 15 per cent below such purchases in 1942, it is indicated in a study by War Production Board's Office of Civilian Supply.

Production of consumer goods and services, it is believed, will decline more than 15 to 20 per cent below 1942—with the deficiency coming out of inventory. The part coming from inventory is estimated at 25 per cent of stocks on hand at the beginning of 1943.

The biggest percentage drop is expected in the purchase of durable goods, such as electrical appliances, radios, etc., continuing the trend which set in last year as a result of the issuance of WPB limitation orders. In 1942 purchase of durable goods by civilians dropped 45 per cent over 1941. It is anticipated that in 1943 consumption of these same goods will fall 35 per cent under 1942.

Purchase of non-durable goods is expected to be 15 per cent under 1942. Last year's purchase of such goods was 5 per cent higher than in 1941.

Production of consumer goods from steel will almost stop except for essential items for which no adequate substitute material has been found.

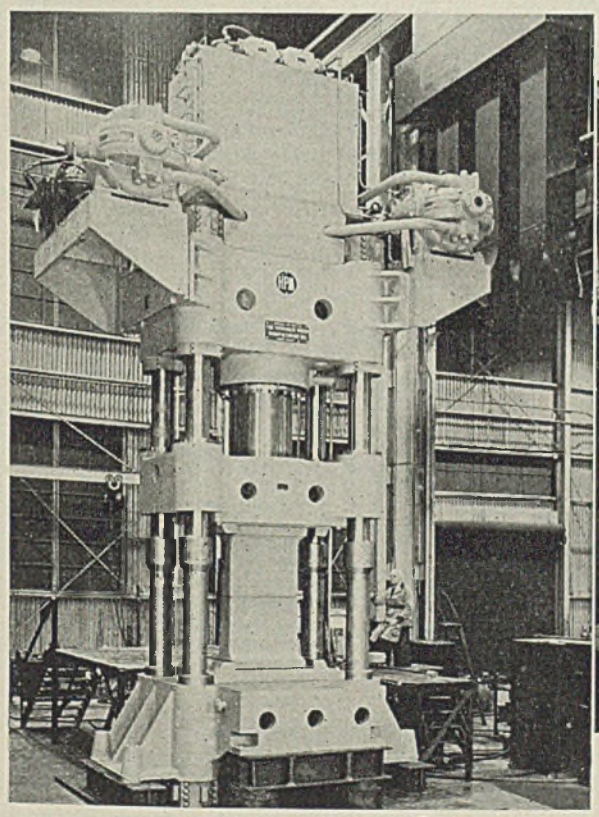
Despite stop-production orders, many nonessential civilian goods made from steel and other critical materials continued to be available in stores to the end of 1942. A number of such items still can be purchased, but inventories are now low and probably will run out before 1943 ends.

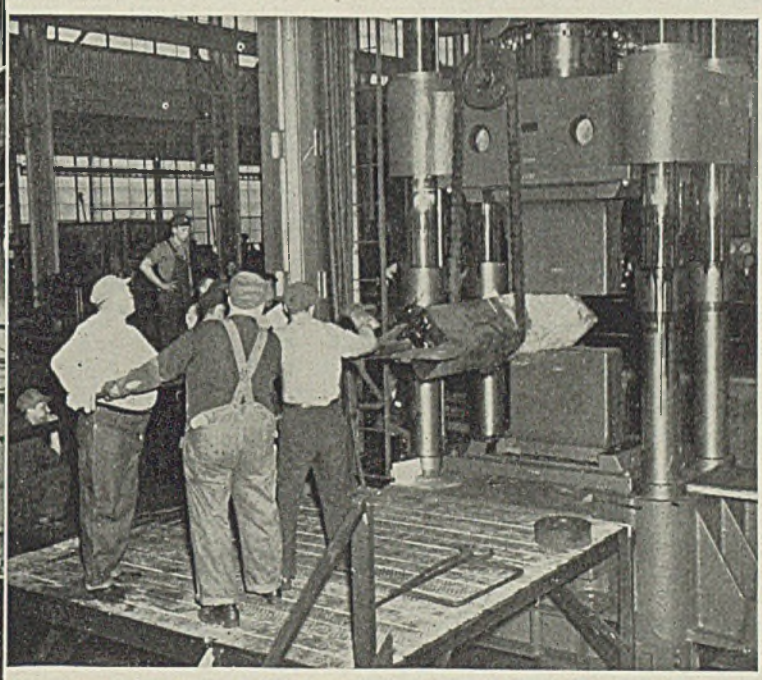
Some consumer articles will be produced in about the same quantity as in the past. They include ice refrigerators, partly as a substitute for mechanical refrigerators, sewing machine needles, to permit operation of sewing machines now in the homes of America and thus increase the clothing supply, liquid fuel lamps and lanterns for farm use, and baby carriages.

Offsetting to some extent the loss of production in civilian goods due to the shortage of steel and other critical materials, the use of substitute materials is permitting considerable production of articles that otherwise might have gone out of production.

The "bed-rock" civilian economy which has been talked about is now expected to be reached in 1943 except in respect to civilian goods made from critical materials, such as steel, copper, etc., but how much civilian economy will be above "bed rock" will be determined largely by the extent and success of military operations during the current year.

NEW HYDRAULIC FORGING PRESS IS DEMONSTRATED





SIXTY representatives of the forging industry recently witnessed a demonstration of a new press built by the Hydraulic Press Mfg. Co., Mt. Gilead, O. A hot steel billet, 15 x 15 x 84 inches was worked down into a spindle, 11 inches in diameter. (See illustrations). Several smaller billets, 12 x 12 x 8½ inches were forged into disks about 18 inches in diameter, 4 inches thick.

Although actual forge-shop conditions could not be duplicated in the demonstration, it showed remarkable features of the press to good advantage. The company is operating at capacity, entirely on war equipment. A representative of the War Production Board was present. Following the demonstration luncheon was served, at which short talks were made by Howard F. Mac-

(*Please turn to Page* 105)

Year's Ingot Output Up 4 Per Cent

Final score is 86,092,946 net tons; 22,072,603 in fourth quarter; several new records

STEEL ingot production in 1942 totaled 86,092,209 net tons, by far the largest tonnage ever made in one year, compared with the prior peak of 82,836,946 tons in 1941, according to the American Iron and Steel Institute. Production in 1929 totaled 47,342,605 tons.

Output in the fourth quarter was 22,072,603 tons, largest for any quarter in 1942 and exceeding every quarter in 1941. In the second six months output was 43,521,962 tons, compared with 42,570,247 tons in the first half. Both fourth quarter and last half establish records for those periods.

December production was 7,303,179 tons, against 7,184,560 tons in November, and 7,150,315 tons in December, 1941. This was exceeded by three prior months in 1942. Highest monthly production was in October, with 7,584,864 tons. Other totals exceeding December were March with 7,392,911 tons and May with 7,386,890 tons.

The industry operated at an average rate of 96.9 per cent of capacity for the entire year, with average weekly output of 1,651,174 tons. This compares with an average rate of 97.3 through 1941, when average weekly production was 1,588,741, on the basis of the smaller capacity then in existence.

December weekly production was just above the year's average, with 1,652,303 tons. Fourth quarter average rate was 98.2 per cent with weekly output of 1,679,802 tons.

Production Loss Due To Floods Relatively Small

Floods along the Ohio river over the turn of the year caused some loss of tonnage but by the middle of last week normal conditions had been restored. In the Pittsburgh district the crest was reached the night of Dec. 30 and receded in the next two days. Loss of production for the week is estimated at about 2 per cent. At Wheeling the crest was a day later and caused interruption equal to about 12 per cent of capacity for the week.

On the lower river Wheeling Steel Corp. was forced to close entirely three days but resumed Tuesday and Wednesday. In the Cincinnati district there was considerable loss in sheet production as Andrews Steel Co. shut down for several days and another company lost some production.

One eastern Pennsylvania steelmaker was closed several days but was able to resume early last week. High water in the Mississippi river washed out about 600 feet of the new war emergency oil pipe line near St. Louis, which will delay opening of the line about four weeks while the pipe is being replaced.

Mills Report New Highs In Many Departments

Weirton Steel Co., Weirton, W. Va., established a new monthly steel production record in December and a new yearly record in 1942. Production of open-hearth steel ingots in December exceeded by 3006 net tons the prior high mark, set in March. Ingot production for 1942 was 8.6 per cent higher than any other year in the company's history. Finished steel production was 8 per cent higher.

Operating at 99.5 per cent of rated capacity in 1942, Republic Steel Corp., Cleveland, established new production records in every major department of steel operation. Steel ingot production reached 8,595,000 net tons, exceeding the 1941 record by 479,000 tons. Of the 12 ingot-producing departments, 11 made

STEEL INGOT STATISTICS

	Estimated Production—All Companies								Calculated weekly production, all companies Net tons	Number of weeks in month
	Open Hearth		Bessemer		Electric		Total			
	Net tons	Per cent of capacity	Net tons	Per cent of capacity	Net tons	Per cent of capacity	Net tons	Per cent of capacity		
Based on Reports by Companies which in 1941 made 98.5% of the Open Hearth, 100% of the Bessemer and 87.8% of the Electric Ingot and Steel for Castings Production										
1942										
Jan. . .	6,328,128	95.4	490,864	86.0	305,930	96.3	7,124,922	94.7	1,608,335	4.43
Feb. .	5,791,813	96.7	453,543	88.0	275,700	96.2	6,521,056	96.0	1,630,264	4.00
Mar. .	6,574,701	99.1	493,294	86.4	324,916	102.3	7,392,911	98.2	1,668,829	4.43
1st quar	18,694,642	97.0	1,437,701	86.7	906,546	98.3	21,038,889	96.3	1,635,994	12.86
April .	6,346,707	98.8	454,583	82.2	321,023	104.4	7,122,313	97.7	1,660,213	4.29
May .	6,600,376	99.5	454,054	79.5	332,460	104.7	7,386,890	98.2	1,667,470	4.43
June .	6,247,302	97.2	452,518	81.8	322,335	104.8	7,022,155	96.4	1,636,866	4.29
2nd qtr	19,194,385	98.5	1,361,155	81.2	975,818	104.6	21,531,358	97.4	1,654,985	13 01
1st half	37,889,027	97.8	2,798,856	83.9	1,882,364	101.5	42,570,247	96.9	1,645,545	25.87
July . .	6,350,047	95.7	453,684	79.6	345,093	96.3	7,148,824	94.5	1,617,381	4.42
Aug. .	6,420,496	96.6	467,313	81.8	345,642	96.3	7,233,451	95.4	1,632,833	4.43
Sept. .	6,297,201	98.0	437,950	79.4	331,933	95.7	7,067,084	96.5	1,651,188	4.28
3rd qtr.	19,067,744	96.8	1,358,947	80.3	1,022,688	96.1	21,449,359	95.5	1,633,615	13.13
9 mos.	56,956,771	97.4	4,157,803	82.7	2,905,032	99.5	64,019,606	96.4	1,641,528	39.00
Oct. . .	6,757,696	101.6	461,895	80.9	365,273	101.7	7,584,864	100.1	1,712,159	4.43
Nov. . .	6,378,661	99.1	458,426	82.9	347,473	99.9	7,184,560	97.9	1,674,723	4.29
Dec. . .	6,471,465	97.6	475,124	83.4	356,590	99.5	7,303,179	96.6	1,652,303	4.42
4th qtr	19,607,822	99.4	1,395,455	82.4	1,069,336	100.4	22,072,603	98.2	1,679,802	13.14
2nd hlf	38,675,566	98.1	2,754,392	81.3	2,092,004	98.3	43,521,962	96.8	1,656,717	26.27
Total. .	76,564,593	97.9	5,553,248	82.6	3,974,368	99.8	86,092,209	96.9	1,651,174	52.14
Based on Reports by Companies which in 1941 made 98.5% of the Open Hearth, 100% of the Bessemer and 87.8% of the Electric Ingot and Steel for Castings Production										
1941										
Jan. . .	6,274,780	99.0	451,806	76.0	195,766	89.1	6,922,352	96.8	1,562,608	4.43
Feb. .	5,669,425	99.1	378,536	70.5	182,393	91.9	6,230,354	96.5	1,557,589	4.00
Mar. .	6,457,641	101.9	460,225	77.4	206,137	93.8	7,124,003	99.6	1,608,127	4.43
1st quar	18,401,846	100.1	1,290,567	74.8	584,296	91.6	20,276,709	97.7	1,576,727	12.86
April . .	6,137,613	100.0	395,056	68.6	221,510	104.1	6,754,179	97.6	1,574,401	4.29
May . .	6,362,245	100.4	444,079	74.7	238,241	108.4	7,044,565	98.5	1,590,195	4.43
June .	6,098,171	99.4	458,848	79.7	235,732	110.8	6,792,751	98.1	1,583,392	4.29
2nd qtr	18,598,029	100.0	1,297,983	74.3	695,483	107.8	20,591,495	98.1	1,582.744	13.01
1st half	36,999,875	100.0	2,588,550	74.6	1,279,779	99.7	40,868,204	97.9	1,579,753	25.87
July . .	6,085,100	94.4	489,297	85.0	237,827	85.7	6,812,224	93.3	1,541,227	4.42
Aug. . .	6,244,353	96.6	495,761	85.9	257,382	92.6	6,997,496	95.6	1,579,570	4.43
Sept. .	6,054,418	96.9	500,768	89.8	256,568	95.5	6,811,754	96.3	1,591,531	4.28
3rd qtr.	18,383,871	96.0	1,485,826	86.9	751,777	91.2	20,621,474	95.1	1,570,562	13.13
9 mos.	55,383,746	98.6	4,074,376	78.6	2,031,536	96.4	61,489,678	96.9	1,576,658	39.00
Oct. . .	6,423,329	99.4	533,060	92.4	279,679	100.6	7,236,068	98.9	1,633,424	4.43
Nov. .	6,194,679	99.0	488,822	87.5	277,384	108.0	6,960,885	98.2	1,622,584	4.29
Dec. . .	6,387,865	99.0	481,813	83.7	280,637	101.2	7,150,315	97.9	1,617,718	4.42
4th qtr.	19,005,873	99.1	1,503,695	87.8	837,700	101.6	21,347,268	98.3	1,624,602	13.14
Total. .	74,389,619	98.8	5,578,071	80.9	2,869,256	97.9	82,836,946	97.3	1,588,741	52.14

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

The percentages of capacity operated in the first six months of 1942 are calculated on weekly capacities of 1,498,029 net tons open hearth, 128,911 net tons Bessemer and 71,682 net tons electric ingots and steel for castings, total 1,698,622 net tons; based on annual capacities as of Jan. 1, 1942 as follows: Open hearth 78,107,260 net tons, Bessemer 6,721,400 net tons, electric 3,737,510 net tons. Beginning July 1, 1942, the percentages of capacity operated are calculated on weekly capacities of 1,500,714 net tons open hearth, 128,911 net tons bessemer and 81,049 net tons electric ingots and steel for castings, total 1,710,674 net tons; based on annual capacities as follows: Open hearth 78,247,230 net tons, bessemer 6,721,400 net tons, electric 4,225,890 net tons.

new high records, the twelfth failing through lack of scrap.

Pig iron output was 5,316,000 tons, a new all-time level, 273,000 tons above the prior peak in 1941. Six of the nine coke plants broke all records. Total coke output was 4,739,000 tons, 129,000 tons above the best prior performance.

Electric furnace ingot production reached 916,000 tons, a new high 57 per cent above 1941, and more than double output of any other year.

Despite loss of many workers to the armed services and shortage of scrap, Inland Steel Co., Chicago, operated for the first 11 months of 1942 at 102.2 per cent of rated capacity, against an industry average of 97.1 per cent.

During the year 51 new production records were made at its Indiana Harbor, Ind., works. Many of the new records were later broken again. Plate output was tripled, a new mark in plate production was set in March with 304,676 tons and a high in pig iron of 152,385 tons in May. One of its ore carriers set a new mileage record with 61,887 miles in 38 trips.

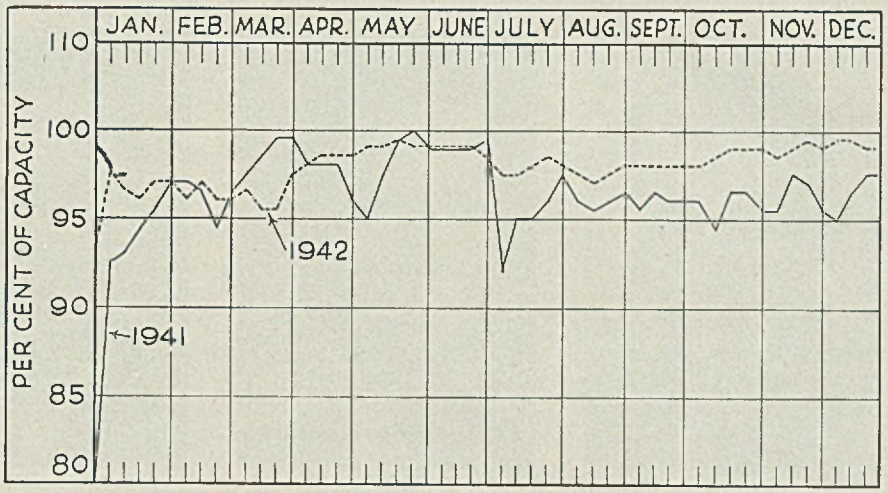
Consolidated To Build Bombers at New Orleans

Production of a new model Navy patrol bomber will be undertaken by Consolidated Aircraft Corp. at a new plant in New Orleans. Capt. William Nelson, production representative in the office of vice president in charge of production, San Diego, Calif., has been named acting division manager for New Orleans.

This announcement follows a Navy Department statement that Consolidated had acquired a Nash-Kelvinator construction project nearly completed at New Orleans.

Harry Sutton, director of engineering for Consolidated, has appointed L. O. Cederwall, chief project engineer, as New Orleans division engineer, and R. M. Zerbe, engineer in charge of training and selective service at San Diego, as administrative engineer at the new plant.

Growing shortage of fluorspar for steel production has brought control of shipments by producers to users of both metallurgical and ceramic grade fluorspar under WPB. The program forbids any producer or shipper to ship fluorspar to persons appearing on Restricted Shipping Lists, sent to producers each month by WPB. Letters outlining the operation of the program have been sent to producers and users of fluorspar.



INGOT RATE . . . . . STEADY

PRODUCTION of open-hearth, bessemer and electric furnace ingots last week was steady at 97½ per cent, the same average as in the prior week, which rate was revised to take account of flood interruptions. A year ago the rate was 96½ per cent; two years ago it was 93 per cent, both computed on the bases of capacity as of those dates.

Pittsburgh — Gained 2½ points from the revised rate of 96 per cent in the prior week, when floods caused numerous shutdowns.

Wheeling—Averaged 70 per cent for the week, the same as the revised rate for the prior week, as recovery from flood damage held back operations.

Chicago — Repair work reduced the rate 2 points to 100 per cent.

St. Louis—Unchanged at 93 per cent, 25 of 28 open hearths active.

Detroit—With two furnaces still down for repairs, production was 92 per cent, a rise of 3 points.

Buffalo—One interest worked all open hearths, district production rising 2½ points to 93 per cent.

Cincinnati—Reduced 15 points to 73 per cent because of interruptions from Ohio river floods. Resumption is planned for this week.

Cleveland—Up ½-point to 93 per cent as one interest added an open hearth and another reduced slightly.

New England—Held at 100 per cent for the second week, all steelmaking equipment active.

Central eastern seaboard—Ingot production resumed at 95 per cent, a gain of 4 points from the revised figure of 91 per cent for the preceding week, when high water stopped production at one plant for several days.

Birmingham, Ala—Steady at 95 per cent.

Youngstown, O. — Flood conditions had no effect on steel production, although some departments encountered difficulties. The rate last week held at 97 per cent, with three bessemers and 77 open hearths active. Republic Steel Corp. took off a blast furnace for relining.

DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week ended Jan. 9	Change	Same week 1942	Same week 1941
Pittsburgh	98.5	+2.5†	95	95.5
Chicago	100	—2	102	100
Eastern Pa.	95	+4†	89	95
Youngstown	97	None	90	94
Wheeling	70	None†	90	91
Cleveland	93	+0.5	92.5	84.5
Buffalo	93	+2.5	79.5	90.5
Birmingham	95	None	90	100
New England	100	None	92	86
Cincinnati	73	—15	91.5	88.5
St. Louis	93	None	76	87.5
Detroit	92	+3	82	94
Average	97.5	None†	°96.5	°93

°Computed on basis of steelmaking capacity as of those dates. †Change is from revised figure of previous week.

Cuban Nickel Plant to Supply 10% of U. S. Needs

Nicaro Nickel Co., subsidiary of Freeport Sulphur Co., New York, is constructing a $20,000,000 nickel plant in Levisa Bay on the northeast coast of Cuba. Project, authorized by Defense Plant Corp., is expected to be completed early next summer, and when full capacity is reached, it will supply from 10 to 20 per cent of the nickel requirements of the United States now imported mainly from Canada.

MEN of INDUSTRY

NORTHROPE JONES

S. C. HUSTED

W. A. CRAMER

JOHN E. WRIGHT

John W. Murphy, heretofore assistant manager of sales at Baltimore for Bethlehem Steel Co., Bethlehem, Pa., has been appointed acting manager of rail sales at Bethlehem to serve in the absence, due to illness, of **H. E. Stoll**, manager of rail sales.

S. C. Husted, assistant district manager of sales at the company's Philadelphia office, has been named assistant manager of sales at Baltimore. **Northrope Jones**, since 1927 sales representative in the Philadelphia office, has become assistant manager of sales there.

For reasons of health **H. G. Walton**, assistant to vice president, has resigned, after 34 years service with the company.

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Philip D. Reed, chairman of the board, General Electric Co., Schenectady, N. Y., has resigned all of his company posts, including directorships in subsidiary companies, effective Jan. 1, to continue his work in London as deputy chief of the Harriman Mission. Mr. Reed arrived from London recently and will shortly return there to resume his duties, which he took up in July, 1942.

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Gordon F. Hess has been appointed district sales manager at Detroit for Republic Steel Corp. Heretofore district sales manager at Houston, Tex., Mr. Hess succeeds **Arthur Schaeffer**, retired.

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William James Russell, manager of engineering for the Westinghouse Electric Appliance Division, Mansfield, O., has been awarded the Westinghouse Order of Merit for "his vision and engineering ability in the field of home appliances; for his broad understanding of the numerous problems involved in the distribution of consumer's goods; and for his contribution to the design of ordnance products for the United States government."

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W. A. Cramer, assistant traffic manager, western district, United States Steel Corp. subsidiaries, has been appointed traffic manager of that district. He succeeds **M. N. Billings**, who is retiring after 39 years of service.

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W. W. Noble has been appointed manager, Pittsburgh branch sales office, Crucible Steel Co. of America, succeeding **J. S. Billingsley**, recently made manager of the company's order and scheduling department in the New York executive offices. Mr. Noble, associated with Crucible since 1926, was previously manager at Detroit and later the Cleveland offices of the company's Pittsburgh-Crucible Division.

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J. W. Belanger heretofore assistant manager, has been named manager of General Electric Co.'s Federal and Marine Department, Schenectady, N. Y., succeeding **D. W. Niven**, manager since 1921, who will continue as a member of the department available for consultation and special duties.

J. W. BELANGER

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John E. Wright has been named regional sales manager in charge of the newly opened Railway Division offices in St. Louis of the Edward G. Budd Mfg. Co., Philadelphia. He was formerly with American Steel Foundries as southwest representative.

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James B. McIntyre, formerly district manager of the New England plant, has been appointed district manager of Baltimore operations for United States Steel Supply Co., formerly Scully Steel Products Co. **Joseph D. Boan** has been named assistant district manager at Baltimore and **Charles D. Surette Jr.**, as manager of the Boston sales office.

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Walter M. Dick, treasurer, Westinghouse Electric Supply Co., New York, retired Dec. 31 after 40 years of service. He joined Westinghouse Electric & Mfg. Co. in 1901 and when the supply company was incorporated in 1922 Mr. Dick was appointed auditor. In 1935 he was elected treasurer and for six years served as auditor and treasurer, giving up the auditor's position in 1941.

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Harry G. Smith, the past seven years associated with Hoosier Lamp & Stamping Co., Evansville, Ind., where he served successively as plant manager, assistant to vice president and contracts manager, has been appointed operations manager, Aircraft Parts Division, Reynolds Metals Co., Louisville, Ky.

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J. Edwin Doyle has been appointed assistant to the manager in charge of labor relations, Lynn River Works,

General Electric Co., Lynn, Mass. Formerly supervisor of the personnel department, Everett Works, Mr. Doyle has been associated with General Electric since 1916, when he joined the transformer department of the Lynn Works.

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Brig. Gen. Donald Armstrong, since last September chief of the Army Tank and Automobile Center, Detroit, and before that chief of the Chicago Ordnance District, has been made commanding general of the Ordnance Replacement Training Center, Aberdeen, Md.

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Arthur A. Frank, executive vice president, Standard Railway Equipment Mfg., Co., Hammond, Ind., has been elected president, succeeding the late Walter P. Murphy. Mr. Frank also was elected president of the Standard Railway Devices Co. and Railway Metal Products Co., both of Chicago, and Standard Railway Equipment Mfg. Co. Ltd., Lachine, Que.

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Fred B. Loveland has been appointed assistant general superintendent, Youngstown district plants of Carnegie-Illinois Steel Corp. Since September, 1937, he has been serving as assistant general superintendent in charge of steelworks and before that was superintendent of the rolling mill, Ohio Works.

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Leo Edelson, the past ten years development engineer for Handy & Harman, New York, has joined Induction Heating Corp., New York, as executive vice president.

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C. W. Meyers, district manager of Republic Steel Corp.'s Central Alloy district, has been given leave of absence to serve as special assistant to **H. G. Batcheller,** head of the Steel Division, War Production Board, Washington. In his absence, **G. W. Putnam,** assistant district manager, will serve as acting district manager.

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In addition to the re-election of **R. E. Zimmerman,** vice president, United States Steel Corp., to serve a third term as president of the American Standards Association, New York, (STEEL, Dec. 21, p. 40) the association announces appointment of the following: Vice president, **George S. Case,** chairman of the board, Lamson & Sessions, Cleveland; chairman, standards council, **H. S. Osborne,** American Telephone & Telegraph Co.; and vice chairman, **E. C. Crittenden,** National Bureau of Standards.

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Austin R. Zender, director of priorities, has been named general sales director, Bridgeport Brass Co., Bridgeport, Conn. **A. Dean Merwin,** general sales manager of the fabricating division, will assume the title of director of fabricating sales. **George H. Tobelman,** sales manager at Newark, N. J., has been appointed eastern district manager, and **Carl P. Quanz,** manager of the company's Chicago office, will take over the duties of western district manager.

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A. E. King, director of traffic, War Shipping Administration, Washington, has resigned, effective Jan. 15, to return to his duties as a vice president of Isthmian Steamship Co., New York.

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Raymond M. Dennis has been named assistant to the president, By-Products Steel Corp., Coatesville, Pa., a subsidiary of Lukens Steel Corp. Mr. Dennis formerly was general manager of the flanging department of Lukens, in charge of estimating, sales and production of flanging. He joined Lukens in April, 1925, as press foreman in the flanging department.

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Thomas Chalmers, vice president in charge of manufacturing operations, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., has also assumed the duties of vice president in charge of raw materials. As his assistants in this new work, **A. B. Haswell,** assistant to vice president in engineering and construction, becomes assistant vice president in engineering and construction; **R. E. Kirk,** general superintendent of coal mines, becomes assistant vice president in charge of raw materials, and **J. M. Spearman,** general superintendent of Fairfield Steel Works, becomes assistant vice president in charge of manufacturing operations.

N. L. Van Tol, works manager, Fairfield works, has been assigned the duty of post-war research.

C. E. Abbott, heretofore vice president in charge of raw materials of both the Tennessee company and the Universal Exploration Co., will devote his entire time to the latter company's affairs.

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John D. Tyson has been appointed manager of sales and metallurgy, Standard Steel Works Division, Baldwin Locomotive Works, with headquarters at Burnham, Pa. Since 1930 he has been chief metallurgist of the division and before that was assistant metallurgical engineer. He will be assisted by **Gifford W. Thompson** as manager of home office sales section.

George S. Baldwin, the past 11 years superintendent of open hearth, has become chief metallurgist of Standard Steel Works Division, reporting to Mr. Tyson. He joined Standard Steel Works in 1931.

Home office sales department of the

LEO EDELSON

RAYMOND M. DENNIS

GEORGE S. BALDWIN

JOHN D. TYSON

CLARENCE C. WEHLING

R. C. GARVEY

E. S. HOLDEN

division is located at Burnham, Pa., instead of Eddystone as heretofore.

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Clarence C. Wehling has been appointed district sales manager at Pittsburgh for Jones & Laughlin Steel Corp. He joined Jones & Laughlin in 1916 and has been associated with the Pittsburgh sales office over 14 years, since June, 1942, as assistant district sales manager of that office.

R. C. Garvey has been named district sales manager at San Francisco, succeeding **C. P. Hensley**, retired. Since January, 1941, he has been assistant district sales manager there, and before that was associated with the Los Angeles office.

E. S. Holden has become resident manager at the Denver sales office, succeeding the late H. H. Galbraith. He has been identified with that office since January, 1940, and prior to that was connected with the Boston district sales office.

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W. I. Galliher has been appointed executive sales manager, Columbia Chemical Division, Pittsburgh Plate Glass Co., Pittsburgh. Formerly director of sales, Mr. Galliher succeeds **Eli Winkler**, who is retained in the capacity of executive consultant.

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O. W. Trumbull has been appointed vice president and general manager, Greene, Tweed & Co., New York. He formerly was associated with Asbestos Textile Co.

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John H. Romann, chief metallurgist, Tube Turns, Louisville, Ky., manufacturer of welding fittings and special forgings, has been granted an indefinite leave of absence to become chairman of a committee to conduct a special nation-wide investigation in industrial plants concerning low temperature properties of metals. This research is being carried on for the War Department by the War Metallurgy Committee of the National Research Council, National Academy of Sciences, Washington.

OBITUARIES . . .

Albert F. Corbin, 76, former president, Union Mfg. Co., New Britain, Conn., died at his home in that city, recently. In 1906 he joined with his brother, George W. Corbin, in the Union Mfg. Co., serving as vice president and general manager until the brother's death three years later, when he became president. He retired in 1929.

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Wesley R. Tinker, 70, president and treasurer, F. Tinker & Sons Co., Pittsburgh, died Dec. 9, in that city.

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William F. Chew, vice president and manager, B. K. Elliott Co., Cleveland, died Dec. 14, in that city.

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William O. Banta, 54, since 1935 sales manager, Sealed Power Corp., Muskegon, Mich., died in that city, Dec. 31.

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William Slocum Barstow, 76, electrical engineer, inventor and former president of General Gas & Electric Co., died at his home in Great Neck, L. I., recently. He was a founder and president of Edison Pioneers, a group of early associates of Thomas A. Edison, who worked with him at Menlo Park, N. J.

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Lawrence L. Prasek, 46, president, Cobb-Prasek Inc., Cleveland, screw machine products manufacturer, died Jan. 3, in that city.

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R. M. Spurck, 54, manager of sales, circuit breaker section, Switchgear Division, Central Station Department, General Electric Co., Philadelphia, died at his home in Llanerch, Pa., Dec. 12.

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William E. Friedman, 63, organizer and head of William E. Friedman Inc., New York, scrap dealer specializing in high speed and other alloy steel scrap specialties, died in that city, Dec. 26. He was a former president, Institute of Scrap Iron and Steel Inc.

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Charles L. Cordes, 70, associated with American Steel & Wire Co., Cleveland, 35 years, died in that city, Dec. 27. He was traffic manager a number of years before retirement in 1938.

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Frank William Harbord, 82, a pioneer in the mass production of steel in Great Britain and former president of the Iron and Steel Institute, died in London, Jan. 2. He was at one time consulting metallurgist to the Indian government and also to the Canadian commission investigating electric smelting in Europe in 1903.

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E. C. Fink, 62, chairman of the board and president, Mack Trucks Inc., died Jan. 1 in New York. In 1911 Mr. Fink was one of a group founding the International Motor Co., later the Mack Mfg. Co.

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Edward E. McNair, 70, former vice president and director, American Radiator & Standard Sanitary Corp., and president, Pacific Steel Boiler Corp., Detroit, died Dec. 31, at his home in St. Petersburg, Fla.

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Robert F. McCloskey, president, Robert F. McCloskey Co., and consulting engineer to the War Department, died Dec. 26, at his home in Pittsburgh. He was formerly vice president and a director, Blaw-Knox Co.

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George Richard Kahrs, 38, salesman in the Buffalo office of American Rolling Mill Co., Middletown, O., died in Buffalo, Jan. 4. He joined Armco in February, 1928, and after a period of training became established in the Buffalo territory.

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, Dec. 14, 1942

M ORDERS

M-9-b (Amendment): Copper, effective Dec. 23. Places copper clad steel scrap under full allocation. Sets up special procedure for disposal of 10 pounds or more of fired shell cases. Provides that persons seeking authorization to accept delivery of copper clad shell cases must furnish Director General for Operations with a letter setting forth all details, including the end use to which material will be put. Persons seeking delivery of copper or copper-base alloy shell cases must apply to Copper Division on PD-59. Processors and manufacturers who generate any type of copper scrap are limited to an inventory of 1 ton. Requires reports from any person accumulating 500 pounds of generated or obsolescent scrap in any one month.

M-9-c (Amendment): Copper, effective Dec. 31. Prohibits use of copper for engraving plates for business stationery, greeting cards, and calling cards. Articles not named on combined and enlarged prohibited list may not be processed, assembled, or finished after Jan. 15 unless they are to fill orders rated AA-4 or higher, or unless the materials were acquired after June 30, 1942. Until Jan. 15, such products can be made only on A-1-k or higher orders, or if the materials were acquired after Feb. 28, 1942. Prohibits installation of insect screening from cut rolls of more than 25 feet in length. Limits use of copper by printing and publishing industry to 60 per cent of a base period (instead of 70 per cent formerly) for purposes other than those controlled by M-9-c-3.

M-9-c-3 (Amendment): Copper, effective Dec. 28. Prohibits delivery and manufacture of paste, ink or leaf with bronze powder or other bronze powder product, or finish or coat any article with bronze powder or bronze powder product manufactured after March 31, 1942.

M-24-d: Used Cotton Bale Ties, effective Jan. 1. Prohibits delivery from plants in the cotton states except to persons baling cotton or textile products or to reconditioners of ties for eventual reuse.

M-126 (Amendment): Iron and Steel Use, effective Dec. 17. Revises List C which sets forth equipment and products permitted to be manufactured of steel and stainless steel for the Army, Navy, Maritime Commission and War Shipping Administration. Lifts ban on use of steel for certain essential civilian items, including: wheelbarrows for handling hot ashes; closures for certain containers; lavatories for railway cars; photo copying equipment for war plants; railings and barriers for industrial use; wire for rat-proofing refrigerator boxes; window shades and rollers for railway cars; certain types of ceramic making machinery; adhesive tape spools (until March 30); lamp manufacturing machinery; spools for wire used in industrial processing; name, date, and instruction plates for machinery and equipment; box and dobby looms for textile machinery; industrial electric vibrators; floor polishing machines, window sash weights. Products or equipment released from the ban on use of stainless steel are: miners' lamps; data and instruction plates; needle valves for stoves, ranges, or hot plates; pipe tubes, tubing and fittings; and repair and maintenance materials for baskets. Among products appearing on military exemption list for the first time are: Access panels for radio equipment; certain types of air conditioning equipment; aircraft fire walls; bases on refrigerating machines for use on board ship; buckets and pails; buckles for clothing; cabinets for radar equipment; manhole covers; meter frame covers; fence posts; fans for use on board ship and where required for corrosion resistance. The only item added to the prohibited list is quicksilver flasks.

M-21-b (Amendment): Iron and Steel, effective Dec. 31. Permits warehouses to increase their receipts during the current quarter in order to make up for deficiencies in quotas during the past year when warehouses had insufficient ratings to obtain all of the steel to which they were entitled under the quota system. Adds fence, netting, barbed wire, posts and gates to items which warehouses may sell on unrated orders. Increases plate quotas to 100 per cent of base period deliveries, and makes certain changes in quotas for Schedule B products.

M-2-b (Amendment): Magnesium, effective Dec. 31. Eliminates all reference to preference ratings. Provides for more strict segregation of scrap by owners or generators.

L ORDERS

L-41-c (Supplementary): Construction, effective Dec. 22. Provides that provisions of L-41 shall not apply to "operational construction" by any logger.

L-42 (Amendment): Plumbing and Heating Products, effective Dec. 19. Revokes schedule VII which had restricted use of copper and copper alloys in hot water heaters and piping systems; schedule IX which had limited the sizes of gas water heater storage tanks, prohibited use of copper and copper alloys, and eliminated metal jackets in such storage tanks.

L-61 (Amendment): Rubber Machinery, effective Dec. 23. Excludes from control tube-repair or spot equipment with retail value of $100 or less, and tire spreaders with retail value of $25 or less. Preference ratings for manufacture, sale, or purchase of tire retreading and recapping equipment will be issued on PD-200 certificates in addition to PD-1A, PD-1X, and PD-408.

L-73 (Amendment): Metal Office Supplies, effective Dec. 26. Prohibits production of certain supplies, including desk pencil sharpeners (assembly permitted until Jan. 15) and metallic file fasteners; of metal repair parts for office supplies with exception of parts for staplers and perforators. Only perforators using 8 oz. or less of metal per unit and 2-hole perforators can be produced after Dec. 31. Three-hole perforators may include as much as 12 oz. of metal per unit.

L-157 (Amendment): Hand Tool Simplification, effective Jan. 1. Exempts handsaws, exported to Canada under BEW licenses or to fill lend-lease orders, within certain limitations from simplified practices prescribed for the domestic market in schedule III. Reduces number of saws that may be produced to 20% of the dollar sales volume of 1941.

L-185: Water Heaters, effective Dec. 19. Prohibits manufacture: of gas fired and oil fired water heaters except for war housing; of solar water heaters. Restricts amount of metal used in production: of coal fired water heaters to amount used in like 1941 quarter; of indirect water heaters to 50% of amount used in like 1941 quarter. Prohibits manufacture of metal jackets for water heaters with two exceptions. Limits use of copper or copper base alloy to controls and safety devices and for specified classes of contracts. Permits use of copper in making repairs and requires return of all replaced copper scrap to scrap dealers. Restricts amount of metal used to make repair parts to amount used for same purpose in like 1941 quarter.

L-199: Plumbing, Heating Tanks, effective Dec. 19. Prohibits with minor exceptions manufacture or installation of metal tank supports, metal tank jackets, and installation of nonferrous metal, stainless steel or monel metal tanks. Prohibits use of copper or copper-base alloy in manufacture of tanks but permits use in making repairs, requiring all replaced copper scrap returned to scrap dealers. Provides specifications and simplified practices for manufacture of black iron and galvanized iron range boilers and expansion tanks. Provides for manufacture or repair and replacement parts but restricts use of metal in any quarter to not more than amount used in like production in corresponding 1941 quarter.

P ORDERS

P-88 (Amendment): Railroad Material, effective Dec. 22. Assigns rating of A-1-j for delivery of certain materials essential for repair and maintenance of track, structures, signal and communications systems, cars, trolley busses, and other operating equipment of street railway systems; A-1-a for emergency repairs upon specific approval of WPB.

P-134: Nonferrous Metal Mills, effective Dec. 31. Assigns AA-2X rating for repair and maintenance material needs by small mills not operating under PRP. Rating is applied to metal parts, lumber and metals appearing in List No. 1 of PD-25A; rating AA-5 for all other materials.

PRIORITIES REGULATIONS

No. 1 (Amendment). Effective Dec. 30, allows persons who purchased material with assistance of preference ratings to sell it or make use of it for purchases other than one for which originally obtained. Under certain circumstances materials may be used to fill orders bearing AA-5 rating or higher, or rating at least as high as they had upon which material was obtained; or for re-delivery to the person from whom purchased.

PRICE REGULATIONS

Supplementary Regulations. Amendments, effective Dec. 31, make it illegal for a person to continue selling a commodity or service for which the license has been suspended for a price violation of Price Order No. 65 (services), or of Supplementary Orders Nos. 11 (chemicals and drugs), 14 (meat and meat products), 17 (iron and steel products), 18 (lumber, lumber products and building materials), 19 (paper and paper products), 20 (second-hand machine tools or extras or second-hand machines or parts).

No. 49 (Amendment): Resale of Iron and Steel Products, effective Jan. 1. Sets new maximum dollars and cents prices for reconditioned cotton bale ties.

Urgency Standing To Determine Service Machine Tool Deliveries

Preference ratings no longer have any effect on delivery schedules for the 75 per cent of machine tool production allotted to service purchasers. Under the terms of General Preference Order E-1-b as amended, delivery schedules now are determined by the urgency standing of the service purchaser.

"Service purchasers" are the Army, Navy, Maritime Commission, or their contractors or subcontractors. Urgency standing is established by the Numerical Master Preference List.

Heretofore, preference ratings were used in scheduling deliveries to service purchasers who had no urgency standings. Under the order as amended, orders from service purchasers without urgency standings are to be scheduled according to the date of receipt of copy of the purchaser's preference rating certificates.

WINDOWS of WASHINGTON

Co-operative planning by Pan-American nations, given effect by U. S. loans, builds new economic solidarity in Western Hemisphere. South America's position promises good future market

"WHERE can I get a good man who understands how to do business in Latin American markets?"

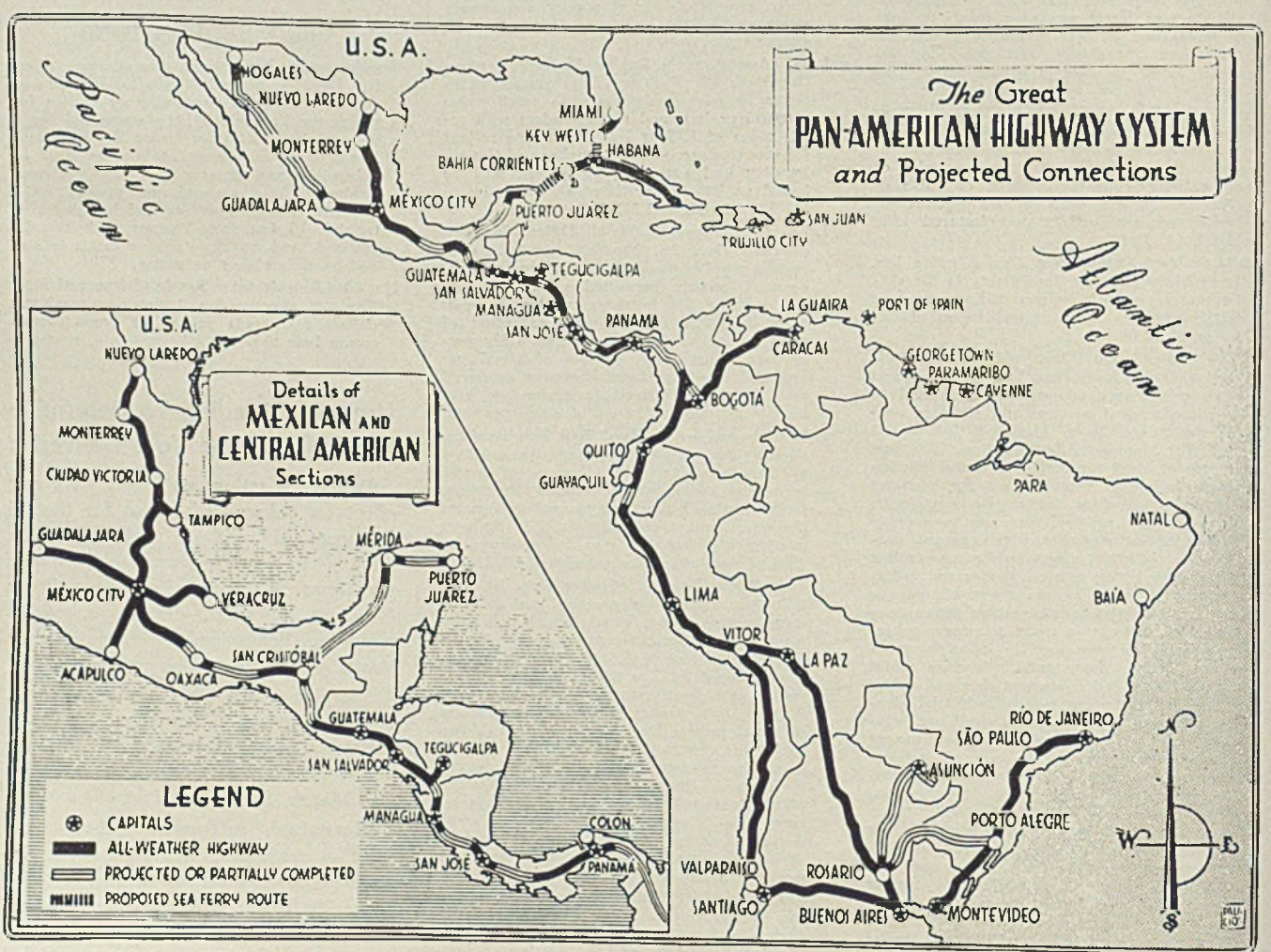
That is a question already being asked. It is bound to be asked on a wide scale when United States manufacturers awaken more fully to the potentials of our postwar business with the other Western Hemisphere countries.

The United States stopped publishing trade figures by individual countries right after Pearl Harbor. Enough information has been given out, however, to make it clear that the initial harsh impact of the war on the Latin American economy lasted only temporarily and that business prosperity and development work in most Latin American countries is at a relatively high rate and continues to improve. It also is known Uncle Sam pays a large part of the bill.

Recently the Department of Commerce disclosed that in the first half of 1942 the other Americas had a net balance of $240,000,000 in exports to the United States over imports compared with net balance of $181,000,000 in first half of 1941. Figures for the remainder of the year may show a greater disparity.

The balance against us rapidly is increasing. The United Nations need a vast amount of Latin American goods to fight the war—and the shortage of materials and of transportation makes it impossible to ship anything to the south unless it is vitally needed for the immediate war effort. It means that we are building up buying power in Latin America which the Latin American countries will want to put to work after the emergency is over. Their need for goods which they will have to get from the United States is growing rapidly. The only limit to what they can absorb at present is what we can give them under the priorities system.

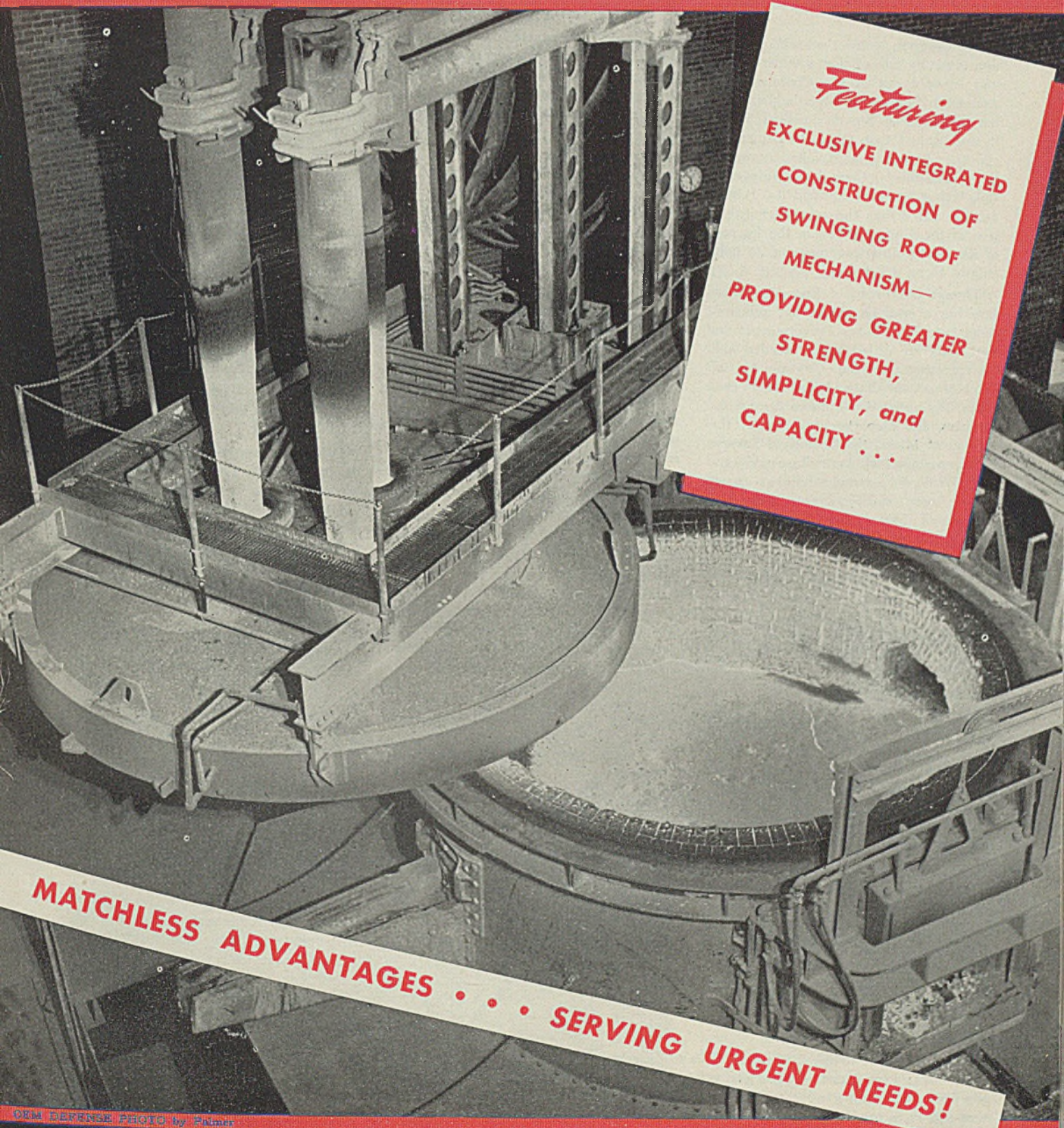
Under the present setup the United States has made agreements with the other American republics to buy virtually all the exportable mineral surpluses, also all exportable surpluses of rubber, balsa wood and other products of the soil. Many of them were made long before Pearl Harbor at times when various materials took on a critical aspect. Most important are the agreements with such important mineral-bearing countries as Mexico, Brazil, Chile, Peru and Bolivia. The agreements provide incentive through attractive prices and long-term commitments under which in some cases, mainly rubber, we will purchase exportable surpluses through 1946. That gives to the Latin American countries a firm basis on which to plan their development work. While the principal emphasis in time of war must be on meeting wartime economic needs, the program also is aimed to improve the overall Latin American economy. It provides for long-range improvement in living standards



Remaining gaps in the long-discussed Pan American highway system rapidly are being closed. It will facilitate movement of goods all over the Western Hemisphere and during wartime will be especially valuable in preventing loss of shipments by submarine sinkings. The project is based upon United States financial assistance

SWINDELL

ELECTRIC ARC MELTING FURNACES



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EXCLUSIVE INTEGRATED CONSTRUCTION OF SWINGING ROOF MECHANISM— PROVIDING GREATER STRENGTH, SIMPLICITY, and CAPACITY . . .

MATCHLESS ADVANTAGES . . . SERVING URGENT NEEDS!

OEM DEFENSE PHOTO by Palmer

SWINDELL-DRESSLER *Corporation*

DESIGNERS AND BUILDERS OF MODERN INDUSTRIAL FURNACES

in Latin America. Scores of projects in the field of health and sanitation, food and emergency rehabilitation are under way in South America, Central America and the Caribbean island republics to support development of rubber, fibers, defense bases, etc.

The program is one that is thoroughly approved by all of Latin America, as was brought out at the Conference of American Foreign Ministers held in January of 1942 at Rio de Janeiro. There it was agreed that the Latin American countries have vast unexploited resources but that to develop them they require capital, technicians and equipment. It was agreed that it was the proper contribution of the United States, in the interest of ideal inter-American relations, to help supply these deficiencies.

Though the Board of Economic Warfare has overall charge of our procurement program, many government departments are called on for needed aid. Co-operating are the Co-ordinator of Inter-American Affairs, Nelson A. Rockefeller, Reconstruction Finance Corp. subsidiaries, the Department of State, the Bureau of Mines, the Geological Survey, the Department of Agriculture and others. BEW, for example, borrows expert mining men and geologists from the Bureau of Mines and the Geological Survey and sends them to Latin America to make investigations and report recommendations. When it needs diplomatic aid it calls on the State Department which department, by the way, is appointing some eight—the exact number has not yet been determined—minerals attaches who will be attached to our embassies, ministries or legations in the countries involved. It gets help similarly from RFC subsidiaries in loaning money or financing approved Latin American transactions. Thus the government has a streamlined setup for procurement materials in the hemisphere.

It is no exaggeration to say that these activities are permanently altering the economy of the Western Hemisphere. In addition to welding United States and Latin American economies, there is the fact that Latin American countries now are doing more business with each other than ever before.

Trade on Continent Better

In the early colonial days they traded mainly with Spain, Portugal and other European countries. Even in 1938 total exports from the South and Central American republics to their neighbors amounted only to a little more than 6 per cent of their total export trade. It is known that by the end of 1942 this figure will have been increased sharply.

Some instances may be cited to show the trend. In 1940 Argentina purchased from Brazil $5,161,863 of fine textiles, as compared with $1,384,000 in 1932. The same country, which used to sell its frozen beef exclusively to Europe, has found a new market in Peru where it is shipping monthly a total of 6000 tons of beef—the equivalent of 30,000 live cattle. A recent agreement between Argentina and Brazil provides that products of new industries in either country will be mutually exempt from import duties for ten years.

El Salvador and Guatemala have entered into a free trade agreement. Guatemala is exporting its native style sandals on a commercial scale. Mexico is buying lard from Honduras. Ecuador is exporting rice to Bolivia, Chile and Peru. Argentina is shipping its iron and steel scrap to Chile which has electric furnaces and rolling mills and returns rolled steel products to Argentina. Chile is selling henequin bags to Salvador.

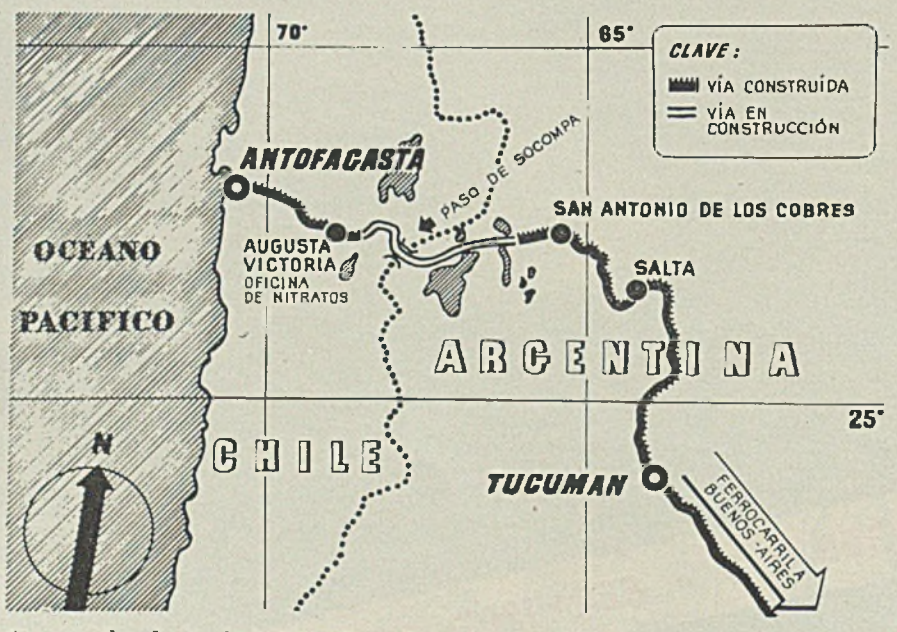
Venezuela exchanges coffee for cement with Argentina. Panama, which used to import fresh eggs and vegetables from the United States and other distant markets, is now purchasing them from Nicaragua, Salvador and Costa Rica. Argentina replaces European coal with coal from Chile.

Colombia has just opened a sample display room in Caracas, Venezuela, to expand markets for its growing domestic industries. It is showing cotton, woolens and silks made in 56 textile mills in Colombia. It is exhibiting samples of woodwork, furniture, toys, wood for the construction industries, chinaware, crockery and leather goods.

There has never been anything quite like this in the Western Hemisphere relations heretofore. It stems largely from co-operative initiative and planning, though lubricated largely by the American dollar. Those who are behind it foresee that by these activities we are creating a demand for a huge amount of United States equipment and services over an indefinite period ahead to develop Latin America's industries and elevate the plane of life.

Transportation Poor

One of the greatest obstacles to Latin American development is the lack of transportation. Many construction projects, financed either by the countries benefitted or, at least in some part, by the United States, are under way. The spectacular Pan-American highway still has some gaps, but rapid progress in filling them in is under way and it is expected that by June of 1943 the basic program will have been completed. Those who have steered this development hold that it is of important military significance. They point out that Latin America has a large number of diesel operated trucks; that she has plenty of fuel and



A new railroad, of which 210 miles still is to be completed, will provide new Pacific Coast markets for Argentine meat and other food products, thus relieving a stringency in which that country went to the extreme of using corn as locomotive fuel. The road will cross the Andes through Socompa Pass, 12,000 feet above sea level. Many difficult engineering problems are involved, the line having 30 bridges, 20 tunnels and 15 trestles or viaducts. One viaduct is built on a curve 800 feet long and 230 feet above the valley. In the meantime the traffic has been begun, using trucks between the approaching rail-heads

that she has rubber as well as tire factories.

In discussing this highway, Edwin W. James, chief of the Inter-American Regional Office of the Public Roads Administration, cites British and Chinese experience to prove that highways are almost invulnerable to damage by bombing. Comparing the Burma Road to those in Peru and elsewhere in Latin America as "a back-country, Grade-D highway", he points out that in 1941 it provided 20,000 tons of vital military and other supplies to the Chinese forces. Chinese humorists jibe the Japanese that while a Jap bomb cost one thousand dollars the hole it made in the road cost only eight cents to repair.

Completion of the Pan-American highway system will make it possible to truck Latin American goods to some Pacific port, as Buenaventura or Guayaquil. Not only would this shorten the journey by sea but it would allow the ships to traverse waters that are safe as compared with the Atlantic or the Caribbean. It is admitted that truck haulage costs more than water haulage —but the reduction in ship losses during the war probably would more than meet this disparity.

We are doing a lot to improve the railroads of Latin America. Last March, with United States aid, Brazil acquired the British-owned Itabira Ore Co. We are helping Brazil to enlarge the production of iron ore at this property, the ore to be shipped mostly to Britain to replace the supply she normally obtained from Sweden. In addition we are assisting Brazil to improve the Victoria-Minas railroad to get this ore to seaboard faster. We also are helping to develop faster loading at seaboard.

Flow of minerals and other materials from Mexico to the United States is expected to be several times in 1943 what it was in 1941. We need henequen, copper, lead, rubber, alcohol, mahogany, zinc, fats and oils, coffee and other Mexican and Central American products on a large scale. To assure that there will be no breakdowns in this movement, we are helping Mexico to rehabilitate some of the key lines of the National Railways of Mexico.

Another potentiality is the possibility of developing rail-truck deliveries from Central and South America.

A railroad gap now under construction will ease the Chilean and Argentine economies. It will connect Antofagasta with Buenos Aires and will hasten shipments of Argentine meat and food products to the new market on the Chilean coast.

All Latin-America Affected

Every Latin American country is affected by the new inter-American setup. Metals Reserve Corp. buys copper and other minerals in Chile, Brazil, Mexico, Peru, Bolivia and other countries. American experts are in Bolivia to set up techniques to get higher tin and tungsten recovery and cut down on present waste. We have a development in process in Cuba to get more nickel ore. We have a manganese investigator in Panama. We have a number of important commitments in Brazil.

We are helping to support the economies of some governments in other ways. For instance, we have a stake in the banana industry of Honduras. Shortage of ships and the consequent inability to bring out bananas on any substantial scale cut down employment to a point that had become serious. On the other hand, Honduras long had been in need of a road from Potreillos to Lake Yojoa, the northern end of the only existing highway connecting the Caribbean coast with Tegucigalpa, capital of Honduras, and the Pacific. At the same time, the highway is regarded as an important ancillary road for the Pan-American highway system. Hence we agreed to finance it and, under the direction of Andrew H. Haxstun, Public Roads Administration engineer, are providing this work for idle banana workers.

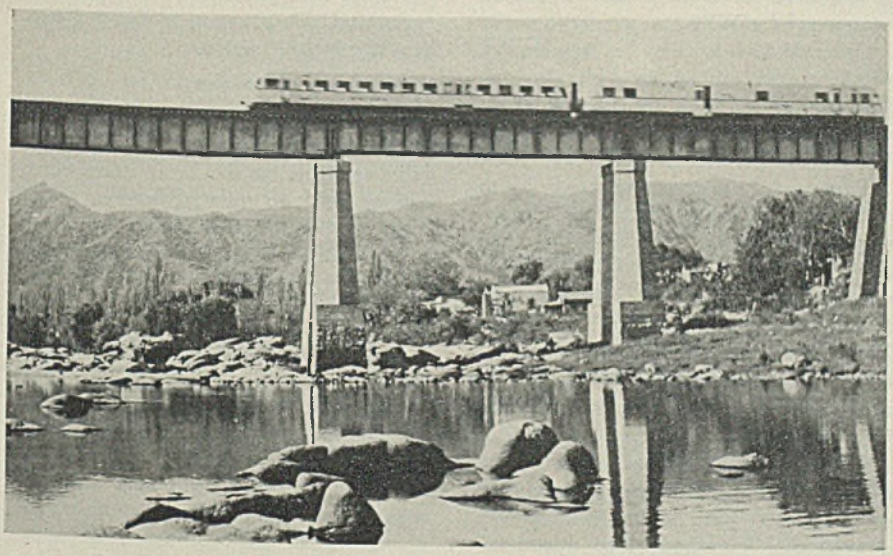
In many respects this inter-American business is fascinating from a human interest standpoint. As an extreme example, the only labor available for getting out an estimated 1500 tons of rubber in Ecuador's Oriente jungle is a tribe of Indians known as the Yumbos. These Indians practically live on the "hunguara" palm. It has a highly edible tuber. It provides hard wood for making spears and arrows. An excellent frying oil is pressed from its nuts. The meat of the nut can be—and is—fermented into hard liquor. The leaves provide the best roofing material in the jungle. The fibers can be woven into cloth. A huntsman by nature, the Yumbo Indian cultivates only two crops—plantains and yuccas. Pineapples and other fruits grow wild. He gets honey from the abundant bees. The forest yields him lard from the tapir, also food birds, rabbits, squirrels and deer. From the river he gets giant catfish weighing up to 100 pounds.

There is only one reason in the world why the Yumbos can be persuaded to get out the rubber. That is their insatiable craving for beads, strung on strings and preferably colored red, white and blue. They trade in the rubber for strings which they place over their necks—and there is no limit to the number they want.

Beads "Made in Germany"

The difficulty was that these beads had been made in Germany prior to the war so that it was with great difficulty that 400 pounds had been rounded up. Once quoted at 8 or 9 cents a pound, the quotation in Quito rose to $17 a pound. The expedition also did some good trading with machetes, Winchester lever-action and Belgian shotguns, gun caps, 100 pounds of gunpowder, shot, a gross of axes and knives, a ton of salt, an assortment of scissors, mirrors, pocket knives, needles, thread, fishhooks, fishing lines, 300 yards of cotton goods and 500 blankets. To these natives it is mystery why white strangers will trade such goods for the sap of a rubber tree.

One of the reasons why development of the vast Amazon valley section in Brazil has been so slow is the prevalence



Latin American countries are fairly well supplied with diesel locomotives and rolling equipment. Above is a train and bridge in the Cordoba hills in Argentina

of malaria, yellow fever and other tropical diseases that sap the vitality of the laborers. In preparing to develop a rubber industry there, also a food industry to support the working force, Brazilian and United States tropical medical specialists are organizing a vast health and sanitation program. More than 1000 construction workers, nurses and skilled technicians already are at work on projects to control these diseases. Six hospitals with 50 beds each are being built at the strategic centers of Braganca, Breves, Santarem, Porto Helho, Rio Branco and Teffe. A fleet of boats is being assembled to move supplies and health workers up and down the 2000-mile stretch. The size of this undertaking is indicated by the fact that it is costing Brazil and United States some $7,000,000. The same sort of projects parallel the development of Brazil's iron ore, also other programs.

All the government departments and individuals who have had a part in this work on behalf of the United States are to be congratulated on one particular accomplishment. That is their success in overcoming deeply-rooted suspicions and in convincing the Latin Americans that we want to be friendly and fair. Latin Americans have had many tangible evidences of this intention. One of the most important is the Office of Price Administration's policy in applying price ceilings to goods for export which give to our customers in the other Hemisphere republics the same protection against exploitation that is given our own citizens.

New outlets, therefore, are open for the postwar period to all sorts of manufacturers. Highway construction, mining, development of power resources, agricultural development, railroad construction, aircraft transportation, air conditioning, communications are some of the activities in which a faster tempo can be expected while at the same time accumulating United States dollars itch to be spent. In looking to the future United States manufacturers are warranted in expecting that Rio de Janeiro, Buenos Aires and Santiago will be just as much a part of the American economy as San Diego, Calif., Cincinnati, O., and Newark, N. J. That means a job of organizing so as to be in a position to capitalize on these opportunities.

Implications for U. S. Industry

So far-reaching is the scope of the inter-American program that it is possible only to indicate its broad outlines in a discussion such as this. The whole picture is one that carries many implications and potentialities to manufacturers who are thinking about postwar business. For example, with United States assistance, iron and steel producing capacity is being expanded materially in Brazil and Mexico not only to give those countries better balanced facilities but to enable them to produce some of the steel for which Latin America is imploring the United States. Thought now is being given to a long-agitated Peruvian plan to establish an iron and steel industry in that country.

New Source of Materials

It is a foregone conclusion that American industry in the future will be more dependent upon Latin America for materials than previously so that the rubber, copper and iron ore developments now under way will be to our permanent advantage. We will look permanently to Latin America for such materials as tin ore, tungsten, mica, vanadium, molybdenum, zinc, lead, manganese, mahogany, rotenone, quinine and many others. All that means that Latin American countries are assured of a permanently better exchange position in United States dollars than ever before.

There are many developments that reveal what is on the horizon. Argentina, for example, had a difficult time after the war broke out to determine what to do with her surplus food products. It has gone to the extent of grinding and briquetting surplus corn to be burned in locomotives in lieu of other fuel. Now Argentina is getting ready to manufacture alcohol on a large scale from corn and from organic wastes to be used in motor fuel mixtures with gasoline. She is negotiating with Colombia to obtain 100,000 tons of good coal from that country in exchange for wheat, corn, cotton and other Argentine products. In addition, Argentina has initiated a considerable amount of exploratory work and has discovered veins of fairly good coal within its own boundaries, also minerals reserves as a basis of future industries.

The former emphasis on gold and silver caused some Latin American countries to base their export trade principally on these metals. The shift in emphasis to other metals and materials already has caused them to take action.

One of the outstanding features in this new trend toward Hemisphere solidarity is the increasing degree to which the Latin Americans are developing enthusiasm over the idea that Western Hemisphere republics can help themselves toward future prosperity only through full co-operation with a strong United States able to round out their economy and able to protect them against aggressors and exploiters from outside.

(A second article on South American trade and industry will appear in Windows of Washington, issue of Jan. 18)

Iron, Steel Warehouses Will Be Permitted Supplemental Quotas

TEMPORARY supplementary quotas, designed to enable iron and steel warehouses to rebuild their stocks, have been announced by WPB.

Order M-21-b is amended to permit a warehouse to exceed its quota for the first quarter of 1943, provided it keeps within its total allotment for the period Jan. 1, 1942, through March 31, 1943.

Purpose of this arrangement is to permit warehouses to "catch up" on tonnages they would have received had they been able to obtain their full quarterly quotas during 1942. Because preference ratings assigned to warehouses have lagged behind the general level of preference ratings, warehouses have not been able to obtain their full quotas from the mills.

This situation has been alleviated by restricting deliveries out of warehouse stocks to AA-5 and higher rated orders, and by the "warehouse load directives" which earmark certain tonnages of mill production for the filling of orders from warehouses. The remaining limiting factor on warehouse receipts has been the fact that the quotas are on a quarterly basis, and this situation is changed temporarily by the action.

Amended order also:

1. Adds woven and welded wire fence, poultry netting, barbed wire, posts and gates to the list of items which can be sold on unrated orders. All of these, except for posts and gates, which are no longer being produced, are being rationed by the Department of Agriculture.

2. Plate quotas are increased to 100 per cent of base period deliveries, instead of 75 per cent as formerly. This will enable warehouses to obtain plates from distressed inventories, and to stock them for future distribution. Current mill production of plates is entirely allocated, so that the enlargement of warehouse plate quotas does not affect distribution by mills.

Smaller Companies May Be Exempt From War Contract Renegotiation

SENATE Committee on Small Business has been notified by Houlder Hudgins, director, Procurement Policy Division of WPB, that steps are being taken to exempt all companies with government contracts or subcontracts totaling less than $500,000 a year from the necessity of renegotiating their prices after delivery. Under present regulations, all firms with $100,000 or more of government work are subject to price renegotiation.

According to Mr. Hudgins, the proposal has been concurred in by the Procurement Board, which is made up of representatives of all the procurement agencies.

Under the proposed policy practically all smaller concerns with war work would be exempted.

Senator Murray called the attention of Mr. Hudgins to the increasing complaints which the Small Business Committee is receiving from the smaller businessmen regarding the "present disorganized methods of renegotiating" the price paid by the government to the contractors, both prime and subcontracts.

No "Overall Standards"

"We have been told," the Senator said, "that there is little or no uniformity among the methods used by the War Department, the Navy Department, the Maritime Commission, and the Treasury's Procurement Division, and that there are no overall standards which enable a contractor to anticipate the outcome of renegotiations in advance or find out whether his treatment is relatively fair as compared with that given other concerns in the same industry."

Replying to the Senator's statements, Mr. Hudgins pointed out that the recommendation for the increased exemption was being submitted to the various services charged with the administration of the acts governing renegotiating with a suggestion that the larger figure be made to apply in all instances "except in extreme cases of excessive profit or in obvious cases where fraud appears to be involved in the transaction."

He added that the acts place the responsibility for renegotiating directly upon the Cabinet officers of the procuring agencies and do not mention WPB. However, he said, the actual administration within the various agencies has been assigned to the men in the agencies who are members of the Procurement Policy Board. Hence the board has become a convenient agency for the exchange of information, problems, and interpretations, and has acted accordingly.

Mr. Hudgins informed the committee that the procuring agencies have been holding a series of joint conferences on the subject of renegotiation of contracts and will shortly issue a combined statement of policy. He gave it as his personal opinion that no further legislative action is necessary at the present time to effect the reforms necessary.

"Nearly All Scientists Engaged in War Research"

Research scientists are heavily engaged in the war effort, according to Dr. Harvey N. Davis, director of WPB's Office of Production Research and Development. A nationwide canvass shows that all the larger industrial research laboratories are carrying heavy war research loads, and only a few of the smaller laboratories are fully available for new war problems. In the universities the number of scientists still available for war research represents less than 1 per cent of the total research manpower.

On the basis of the returns from questionnaires, it is estimated that less than 2 per cent of all the industrial laboratories are now completely available for this purpose, and that more than two-thirds have less than a quarter of their capacity open. Less than 650 industrial research workers were represented by those laboratories reported as completely available.

Sample Deliveries of Carbon, NE Steels May Be Continued

To encourage further use of plain carbon steel and the NE alloy steels, the War Production Board has renewed an arrangement by which sample quantities of steels for experimental purposes can be delivered to manufacturers or laboratories without regard to preference ratings.

Any manufacturer or laboratory wishing to obtain samples of steel under this arrangement is asked to certify on the purchase order that such steel is to be used in making tests; that quantities ordered, added to amounts already received or on order from other sources, will not amount to more than 1000 pounds of each composition; and that the total amount of all compositions of such steel on hand or ordered from all sources for testing purposes does not exceed 3000 pounds. This limitation is for the first quarter of 1943.

Knowlson, Rosenwald Quit War Board Posts

James S. Knowlson has resigned as vice chairman of the WPB. In announcing the resignation, WPB Chairman Nelson said he was retaining Mr. Knowlson within the organization on a "when actually employed" basis, so that he could be called on as a consultant or special assistant from time to time. Mr. Knowlson resigned to return to his duties as president and chairman of the Stewart-Warner Corp., Chicago, which has a large volume of war orders, and Mr. Knowlson felt that he could no longer remain away from its helm.

Lessing J. Rosenwald, director, WPB Conservation Division, has resigned because "he was not completely in accord with the recent reorganization placing his functions in the new War Resources Agency". Mr. Rosenwald formerly was connected with Sears, Roebuck & Co. His successor has not been appointed but it is expected that Paul C. Cabot, deputy director, will serve as acting director for the interim.

Additional Industry Advisory Groups Named

Industry advisory committees recently established by WPB in the metalworking industry include:

Professional and Industrial Cutlery

Anthony Bisgood, of the Consumers Durable Goods Division, is government presiding officer.

Members: Charles E. Dorrell, Russell-Harring Cutlery Co., Southbridge, Mass.; George E. Chatillon, John Chatillon & Sons, New York; J. O. Woodsome, Lamson & Goodnow Co., Shelburne Falls, Mass.; and H. C. Corbin, Ontario Knife Co., Franklinville, N. Y.

Small Diamond Dies

R. J. Lund, of the Miscellaneous Minerals Division, is government presiding officer.

Members: Paul Bieberich, Fort Wayne Wire Die Co., Fort Wayne, Ind.; Louis Chambre, Balloffet Dies & Nozzle Co., Guttenberg, N. J.; Frank Demond, Hoskins Mfg. Co., Detroit; Otis Ferrier, Indiana Wire Die Co., Fort Wayne, Ind.; Samuel Harris, National Wire Die Co., New York; and J. F. Kavanaugh, C. O. Jellif Mfg. Corp., Southport, Conn.

Scissors and Shears

Anthony F. Bisgood, Consumers Durable Goods Division, is the government presiding officer.

Members: Norman S. Wiss, J. Wiss & Sons Co., Newark, N. J.; Max G. Hammerschlag, W. H. Compton Shear Co., Newark, N. J.; J. C. O'Connor, Acme Shear Co., Bridgeport, Conn.; W. L. F. Wieber, Henkel-Clauss Co., New York; E. W. Smiley, Berridge Shear Co., Sturgis, Mich.; and W. R. Bowes, Clayton Mfg. Co., Bristol, Conn.

ARMY E NAVY

BULLARD

Mighty Soldiers

BEHIND the LINES

● The Bullard Mult-Au-Matic was first conceived and used in the Automotive Industry nearly 30 years ago. From the start it applied a method of cost saving and speed of production which revolutionized machining processes.

But not till the war was one of its biggest features fully utilized. Each machine could be quickly and easily converted to vital war production. In many cases Mult-Au-Matics have been retooled and changed-over to airplane engine work and other badly needed war equipment.

There are no Bullard Mult-Au-Matics "laid up" for the duration—and when the time comes to switch back to peace-time work, these machines will be quickly and easily changed-over to their new classes of work. Mult-Au-Matics are always all-out production machines—in all ways.

THE BULLARD COMPANY

BRIDGEPORT, CONNECTICUT

By A. H. ALLEN Detroit Editor, STEEL

MIRRORS of MOTORDOM

Begin program of standardizing accessories on military vehicles in interest of relieving field service problem. GM now has 75 per cent of machine tools required for war work

DETROIT

ARMY Ordnance, through its Tank-Automotive Center here, is undertaking a project which will have far-reaching implications for all suppliers of parts for military automotive equipment—the simplification or "streamlining" of parts and accessories. It springs from the urgent demand from the field for easing of the terrific supply and maintenance problem now existing because of the many varieties of vehicles in service.

In the early stages of war production, the primary aim was to get serviceable vehicles into action as swiftly as possible, regardless of uniformity or nonuniformity in types and sizes. The industry answered this call with alacrity and there has been a rapid accumulation of mobile fighting equipment. Quantitatively it was a remarkable job, but now appears the fly in the ointment—too many types and sizes, too many different accessories and parts—making the problem of field service a tough one.

For example, there are in the present series of 14 tactical motor trucks eight different types of generators, eleven different starting motors, eleven varieties of batteries, eight designs of distributors, six types of spark coils. Tank-automotive officers and engineers are convinced these must be reduced sharply. Generators, starter motors and batteries must be standardized to four or five types and sizes, at the most; distributors should be reduced to three at most, spark coils to two. The same holds true with other parts. Fourteen types of starting gears must be cut to five; ten different air cleaners, 12 different clutches, and so on down the list of component parts, all must be simplified in the interests of tactical necessity.

A Ticklish Situation

This is no simple problem, and someone's toes are bound to be stepped on. Each producer of military vehicles has his established sources for accessory equipment and has designed his product so that specified types of accessories will fit. If a number of types are to be abandoned, then the vehicle builder may have to redesign to accommodate the standard accessory, and the supplier of such accessory is faced with the problem of shutting down the manufacture of his own product and retooling to make a competitor's design. This is a ticklish situation.

To get a start on the work, the Tank-Automotive Center has organized a simplification section and placed Lieut.-Col. Frank A. Mickle, former associate professor of mechanical engineering at the University of Michigan, in charge, with C. W. Kynoch assisting. Naturally they will have to enlist the utmost co-operation from the industry. They are beginning the task by taking the following steps:

1. Complete mechanical data are being obtained on all vehicles and their components to determine where simplification may be accomplished.

2. Efforts are being made to eliminate from the series of combat and transport vehicles all duplications and variations in basic types, sizes and components.

3. Samples of current production vehicles are being brought together in Detroit for examination by engineers of Army Ordnance and industry to determine where a high degree of interchangeability of parts can be effected.

This problem of vehicle standardization is nothing new. It was encountered in the last World War and had its disastrous aspects, as any service man who had contact with motor equipment in France can testify. Manufacturers in the early stages of the current conflict recognized the service problem which was being created and made recommendations to ease it. One was to send vehicles of a certain type to one specific threater of action, another type to a different theater, etc. In this way, service parts of a single type could be concentrated in a single theater. Obviously, the problem is not as simple as this, but the basic thinking was as outlined. To a certain extent, military logistics experts have followed this policy.

One of the most effective programs of military vehicle standardization which comes to mind was that developed for the production of "half-tracs". As soon as funds were available for heavy production of these vehicles, the Army called representative manufacturers to Washington and asked them to work up a standard design of half-trac which could be made in three or four plants, with parts interchangeable. White Motor, Diamond T and Autocar companies co-ordinated their engineering and purchasing activity toward this end and are now producing such a standard type of half-trac. Co-ordination has even been carried to inspection and service details.

Original intention was to use half-tracs as reconnaissance vehicles, and later as personnel carriers. They carried about the same armor plate protection and machine guns as did scout cars. However, in the course of field operations, many other uses were found for these combination wheel and track vehicles, including more direct combat service as tank destroyers. Experiments were made with various size guns, including mortars, howitzers, field pieces and antiaircraft guns. Result has been that today the half-trac tank destroyer mounts heavier guns than do the tanks they come up against, and has given such a good account of itself in the field that it appears to have displaced the various types of all-wheel tank destroyers which leading automotive companies were planning to produce not so many months ago.

Tooling Well Over Hump

C. E. Wilson, president of General Motors, has revealed some interesting figures on the extent and rate of machine tool installation in GM plants as a result of the war production effort. Since the middle of 1939 when the corporation began tooling for arms production in earnest, 49,087 new machines have been ordered. By the end of December, 37,838 had been delivered, with shipments running currently between 2500 and 3000 machines a month. About 11,200 machines remain on order, and the rate of delivery now is well ahead of new orders.

GM now has a total of 112,407 machine tools engaged in the war effort, with some 19,590 tools idle, these mostly presses and special automotive equipment for which no war production has been located.

Through the Automotive Council for War Production's machine tool listing service, GM has sold 1460 idle machines to other companies and 846 to government agencies. Through its own organization, it has consigned 422 machines to subcontractors and has transferred 2766 among its own divisions.

November deliveries of war products from GM plants, latest month to be tabulated, show $247,685,749, a decrease of $719,811 from October. The failure to maintain acceleration of deliveries in November was due to three things: A shorter work month; shifts in production schedules, and savings resulting from renegotiated contracts, the latter amounting to several million dollars.

Engines Roll from Packard

Engines for PT boats and airplanes rolled out of Packard Motor Car Co. plant during the past year in dollar volume better than double the peak peacetime output, for an estimated annual total of $206,000,000. With pardonable pride, George T. Christopher, Packard president and general manager, looked back over the achievement at a press conference last week, and pointed out that the

company produced 1½ times as many war engines in 1942 as in the entire period of World War I when Packard was the largest builder of Liberty engines. And the engines now being built average in cost about three times the value of the Liberty engine, so actually dollar volume of production was 4½ times that of the Liberty engine era.

Mr. Christopher said the year was finished three weeks ahead of engine schedules, and current production is close to $1,000,000 worth of product daily. The job now at hand is to double the present schedule and to do it Packard will have to call on a couple of hundred subcontractors for major assistance. Marine engine schedules will not be changed, but output of Rolls-Royce 1350-horsepower aviation engines is to be stepped up just as fast as is possible. Packard production in 1943 will come close to $300,000,000, it is estimated.

About half the cost of the Rolls-Royce engine is now being subcontracted and to meet increased schedules this figure will have to be moved up to 75 per cent, with a 20 per cent increase in assembly labor on the present Packard engine lines. No great increase in machine tool and equipment purchases will be necessary, projected requirements calling for about a 10 per cent addition.

This should be good news for vendors and parts suppliers who may have idle machining capacity as a result of reduced schedules on ordnance. Packard is now in process of contacting hundreds of sources and persuading them to take a larger share of the Rolls-Royce work or to shoulder some new parts. One company, for example, is contemplating the conversion of its gray iron foundry to the production of aluminum castings for the Rolls-Royce, on the basis of about 50,000 pounds daily.

Foundry Pours Aluminum

Packard already has converted its gray iron foundry to aluminum and currently is pouring 7000 pounds a day from eight melting furnaces, duplicating the parts furnished by three other sources.

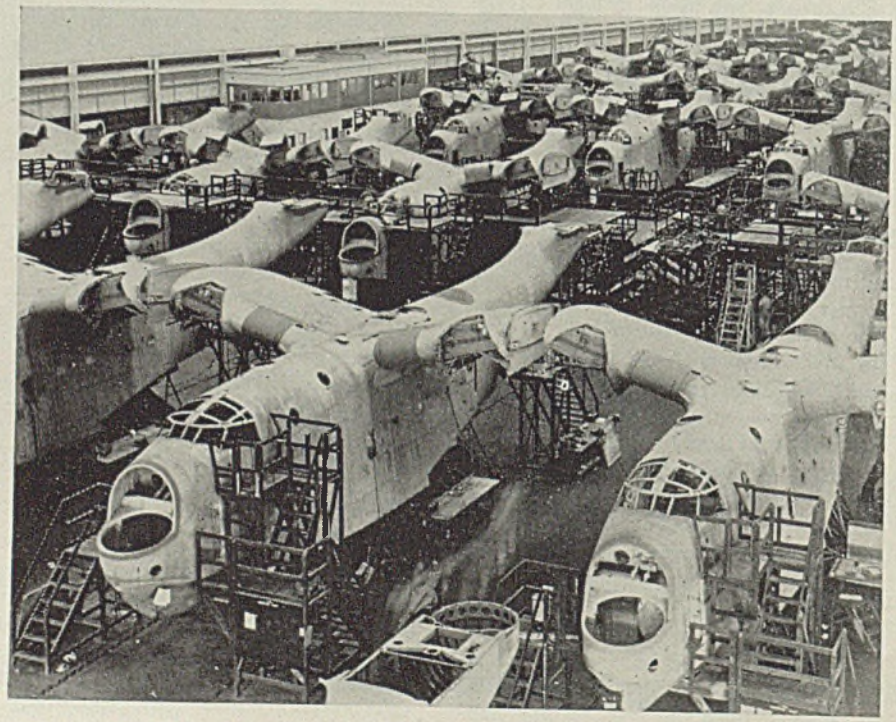
In the opinion of the Packard president, the seriousness of the Detroit labor shortage is being overplayed by government labor officials. He says that his employment department is currently interviewing about 1200 persons a day which represents a lush labor market compared to the boom times of 1927-29 when Detroit automobile plants found their employment offices deserted and had virtually to "sandbag" workmen from as far away as St. Louis, and even then occasionally watch some competitor take "aliens" as they detrained.

Packard is losing about 400 men per month to the armed forces, and close to 3000 already have left production jobs for the services. When the Rolls-Royce job was started, the employment policy was based on hiring young high school graduates and training them for the precision jobs to be filled. This proved easier than untraining and retraining former automotive workmen, but the policy has backfired to a certain extent since these young men proved to be prime draft fodder.

Originally, the Rolls-Royce project was laid out for no women in the shop, but this has all been changed now (and at considerable expense). Women now constitute about 13 per cent of the payrolls and the expectation is that this figure will rise to 30 per cent.

Asked about the postwar automobile, Mr. Christopher echoed the beliefs of other automotive officials and said that it would resemble the last of the 1942 models with minor changes. He said new cars will be "like the '42 jobs".

ASSEMBLING "MARINER" PATROL BOMBERS



ROWS of Navy "Mariner" patrol bombers move down the final assembly line at Glenn L. Martin Co.'s plant in Baltimore. These 24-ton ships will hunt submarines preying on United Nations' shipping. This is the first photograph of the Mariner production line to be released by the United States Navy

Fisher Body To Fulfill Large Gun Parts Contract

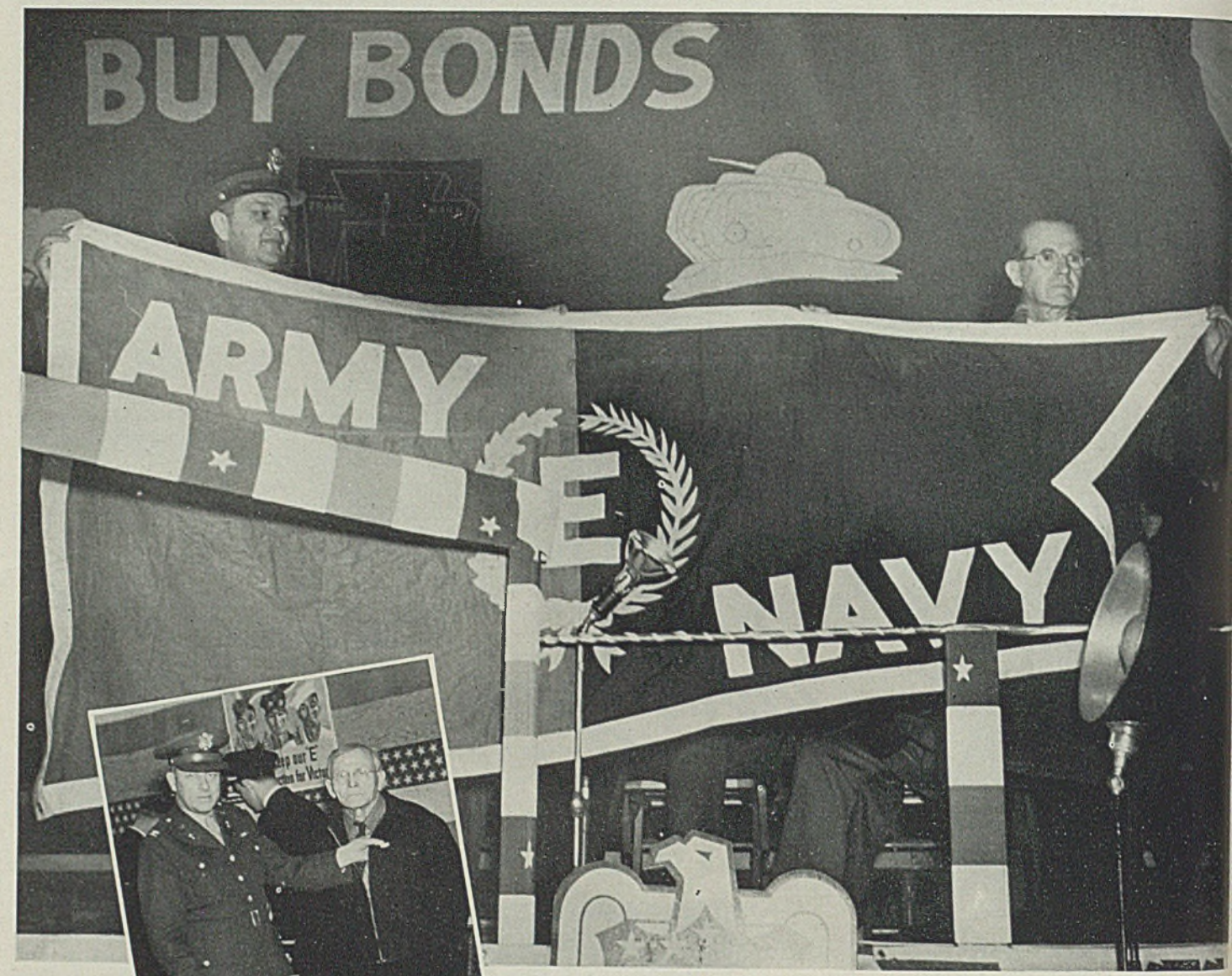
New contract which will make the Fisher Body Division of General Motors one of the nation's leading manufacturers of gun breech housing mechanisms for the Navy antiaircraft weapons has been disclosed.

Since early 1941 Fisher has been producing the complex breech housing mechanisms for these weapons, and the new contract calls for expansion of the job to mammoth proportions. Monthly output will be at the highest rate ever undertaken by one company, with production being 10 times greater than the original rate.

Although approximately 40 per cent of the machines needed for the expanded job are available, nearly $4,000,000 worth of new machines and equipment will be required. In addition arrangements are being made for extensive subcontracting.

Correction

The 105-millimeter self-propelled gun, illustrated in this department Dec. 7, p. 92, and discussed briefly here in the issue of Dec. 28 is correctly identified as the M-7, spokesmen for the Tank-Automotive Center of the Ordnance Department point out. The "M" prefix denotes a model in production, "T" being reserved for experimental models. The number indicates the designation applied to a current model, and does not differentiate it from other types of mobile ordnance, such as tanks, armored cars, half-tracs, etc.



S. Horace Disston, president, Henry Disston & Sons Inc., Philadelphia, receives pennant from Col. D. N. Hauseman, Army Ordnance

Henry Niemeier, blacksmith for more than 50 years with Broderick & Bascom Rope Co., St. Louis, is awarded employe pin from Col. Merle H. Davis as "E" award was renewed

Many More Industrial Firms Honored for War Output

ADDITIONAL industrial establishments to receive the Army-Navy Production Award for outstanding performance on war work have been announced by Under Secretary of War Robert P. Patterson and Under Secretary of the Navy James V. Forrestal.

Names and addresses of these plants:

Adams and Westlake Co., Elkhart, Ind.
Aetna Ball Bearing Mfg. Co., Chicago.
The Aircraft Fitting Co., Cleveland.
American Cyanamid Co., Calco Chemical Division, Bound Brook, N. J.
Anaconda Copper Mining Co., Anaconda, Mont., and Reduction Works, Great Falls, Mont.
Cinaudagraph Corp., Stamford, Conn.
Continental Rubber Works, Erie, Pa.
DeJur Amsco Corp., Shelton, Conn.
Detroit Broach Co. Inc., Detroit.
Guy P. Harvey & Son, Leominster, Mass.
Inland Steel Co., Indiana plant, Indiana Harbor, Ind.
Keystone Trailer & Equipment Co., Kansas City, Mo.
Mack Molding Co., Wayne, N. J.
Charles Mundt & Sons, Jersey City, N. J.
Pittsburgh Coke & Iron Co., Neville Island plant, Pittsburgh.

At presentation to Buffalo Forge Co. Above, Left to right: Col. John M. McDowell; Henry W. Wendt, chairman, and Edgar F. Wendt, president of Buffalo Forge; Comdr. R. S. Smith; Admiral Wat T. Cluverius; C. A. Booth, vice president

W. T. Hunter, vice president, A. Schrader's Son Division, Scovill Mfg. Co., receives congratulations by Maj. H. R. Battley, while veteran employes and Navy official display the "E" pennant, below

Lincoln Park Tool & Gage Co., Lincoln Park, Mich., is presented the burgee at ceremony in local high school

Ranco Inc., Columbus, O.
Republic Steel Corp., Birmingham Division of the Gulf Steel Division, Birmingham, Ala.; Gulf Steel Division, Gadsden, Ala.; Central Alloy District, Canton, O., and Central Alloy District, Massillon, O.
Reynolds Spring Co., Jackson, Mich.
Russell Mfg. Co., Middletown, Conn.
Shell Oil Co. Inc., Wood River Refinery, Wood River, Ill.
The Stanley Works, main plant, New Britain, Conn.
Tennessee Coal, Iron & Railroad Co., Bessemer rolling mill, Bessemer, Ala.; Ensley Works, Ensley, Ala., and Fairfield Steel Works, Fairfield, Ala.
Weaver Mfg. Co., Springfield, Ill.
Willys-Overland Motors Inc., Toledo, O.
Acme Pattern & Tool Co. Inc., Dayton, O.
Altorfer Bros. Co., East Peoria, Ill.
Aro Equipment Corp., Bryan, O.
Belding Heminway Corticelli Co., Putnam, Conn.
Cadillac Motor Car Division, General Motors Corp., Detroit.
Cleerman Machine Tool Co., Green Bay, Wis.
Damascus Steel Products Corp., Rockford, Ill.
Delta Mfg. Co., Milwaukee.
E. I. du Pont de Nemours & Co. Inc., The Belle Works of the ammonia department, Charleston, W. Va.
Fisher Body Division, Plant No. 1, General Motors Corp., Flint, Mich.
Fisher Tank Arsenal, General Motors Corp., Grand Blanc, Mich.
S. Froelich Co. Inc., New York.
General Motors Proving Ground, Milford, Mich.
Hercules Motors Corp., Canton, O.
Hudson Motor Car Co., Airplane Division, main plant, Detroit.
Hyatt Bearings Division, General Motors Corp., Harrison, N. J.
Johnson Motors, Waukegan, Ill.
Lima Locomotive Works, Shovel and Crane Division, Lima, O.
C. H. Masland & Sons, Carlisle, Pa.
Mathews Conveyer Co., Ellwood City, Pa.
McDonald Mfg. Co., Los Angeles.
J. Mergenthaler & Son, New York.
George C. Moore Co., Westerly, R. I.
Ocean City Mfg. Co., Philadelphia.
Ohio Steel Foundry Co., Lima, O., and Springfield, O.
H. K. Porter Inc., Everett, Mass.
Poulsen & Nardoff Inc., Los Angeles.
Seng Co., Chicago.
Unitcast Corp., Steel Casting Division, Toledo, O.
United States Automatic Corp., Amherst, O.
Victor Equipment Co., San Francisco.
Wallace & Tiernan Products Inc., Belleville, N. J.
Wallace & Tiernan Co. Inc., Belleville, N. J.
Walworth Co. Inc., Kewanee, Ill.
Weir Kilby Corp., Cincinnati.
Western Stove Co. Inc., San Bernardino, Calif.

Material, Manpower Controls Aid War Problem; Steel Output at Peak

TORONTO, ONT.

CANADA'S steel supply on war account has brightened considerably in the past three months and industrial labor shortages are being overcome. C. D. Howe, minister of munitions and supply states that "as the result of rigid control, we have been able to take care of essential steel requirements. I think it can be said now that we will have sufficient steel to carry out all our programs, but I would not have dared to make this statement two months ago. In the expansion of Canada's steel industry the most spectacular developments have been in alloy steels, where the output has been multiplied more than six times, making this country practically independent in providing alloy steel of types used in guns, armor plate and machine tools.

"Selective service is functioning to correct labor shortages in industry with the result that situations that seemed serious two or three months ago now have been corrected. Compared with any of her allies, Canada's war machine is simple and effective, and the method of organization followed in this country has been widely praised and extensively copied. The period of scarcity will pass and with the passing, the controllers will disappear. They will leave behind them new industrial developments, added sources of supply and better organized industries."

Further restrictions have been placed on use of steel, iron and other metals for non-essential purposes and more drastic action is said to be under consideration. Manufacture of wooden ice boxes now is only on a permit basis and design must conform to specifications of the supplies controller. Not more than two models may be made and metal, including joining and fastening hardware, must not exceed 14 pounds for 100 pounds of ice capacity or less and 17 pounds for those with more than 100 pounds capacity.

Conventions Are Canceled

A recent order prohibiting manufacture of metal signs and discs has been amended to permit use of terne plate salvaged from old tin cans for tags, badges or discs for factory personnel.

More than 50 per cent of conventions scheduled for 1943 have been canceled on request of the government, to relieve railroad congestion, and notices are being received daily from associations conforming to the order. Even with abandonment of civilian meetings and sporting events the railway problem still is considered serious.

As a direct result of war materials production and shipment foreign trade of Canada rose to an all-time high of more than $4,000,000,000 in 1942, with further expansion indicated for 1943. It is officially estimated that in 1942 Canadian war industry produced goods valued at $2,600,000,000, compared with $1,200,000,000 in 1941. Official estimates for 1943 indicate output valued at $3,700,000,000, possible by utmost organization of equipment and resources.

Trade Minister MacKinnon estimates that 70 per cent of munitions and war supplies made in 1942 have been placed at disposal of the allied powers, 50 per cent to British fronts and Russia and 20 per cent to the United States and the Pacific war zones.

Mineral production in Canada reached its highest mark in 1942 with value of $564,200,000, according to estimates of the Dominion Bureau of Statistics. This was an increase of about $4,000,000.

In addition to steel capacity added in 1942, even greater expansion is slated for early 1943. According to programs now under way 500,000 tons will be added within the first four months of 1943. The Steel Co. of Canada Ltd., Hamilton, Ont., is installing a new electric furnace with rated capacity of approximately 130,000 tons of alloy steel per year, which will bring production of this special type of steel to about 515,000 tons per year; the same company is installing a bessemer furnace for lower grade steel, which will add about 120,000 tons per year. Algoma Steel Corp. Ltd., Sault Ste. Marie, Ont., in connection with its $14,000,000 expansion program, is building a new bessemer converter with annual capacity of about 250,000 tons. Dominion Foundries & Steel Ltd., Hamilton, Ont., and Atlas Steel Ltd., Welland, Ont., also are planning further large additions.

Production Rate Higher

Production of steel ingots and castings, pig iron and ferroalloys in November fell slightly below that of October, due to the shorter month, but average daily output was higher, reaching all-time peaks. Ingot production averaged 9027 net tons, compared with 5659 tons in October, pig iron reached 5686 tons per day compared with 5659 tons in October. For 11 months pig iron showed an increase of 33 per cent over the same period in 1941 and steel ingots and castings 16 per cent.

Figures of the Dominion Bureau of Statistics show annual capacity for steel ingots and castings at the end of November was 3,426,000 net tons, compared with 2,993,000 tons at the beginning of 1942. Capacity of the 12 blast furnaces is given as 2,123,320 tons.

Comparative figures on steel and iron production are as follows:

	Steel ingots, castings	Pig iron	Ferro-alloys
Nov., 1942	270,812	170,578	16,733
Oct., 1942	271,127	175,424	18,266
Nov., 1941	247,831	149,783	19,127
11 Mos. 1942	2,851,527	1,810,622	194,069
11 Mos. 1941	2,456,468	1,361,873	193,232
11 Mos. 1940	2,044,842	1,185,427	131,056

STEEL MATTING HELPS MARINES LAND VEHICLES ON BEACH

STEEL matting is laid on the beach at Guadalcanal Island to prevent heavy vehicles from sinking into sand as they are landing from vessels. This picture shows natives helping the United States Marines. U. S. Marine Corps photo

Warehouse Salesmen Organized For Dormant-Scrap Drive

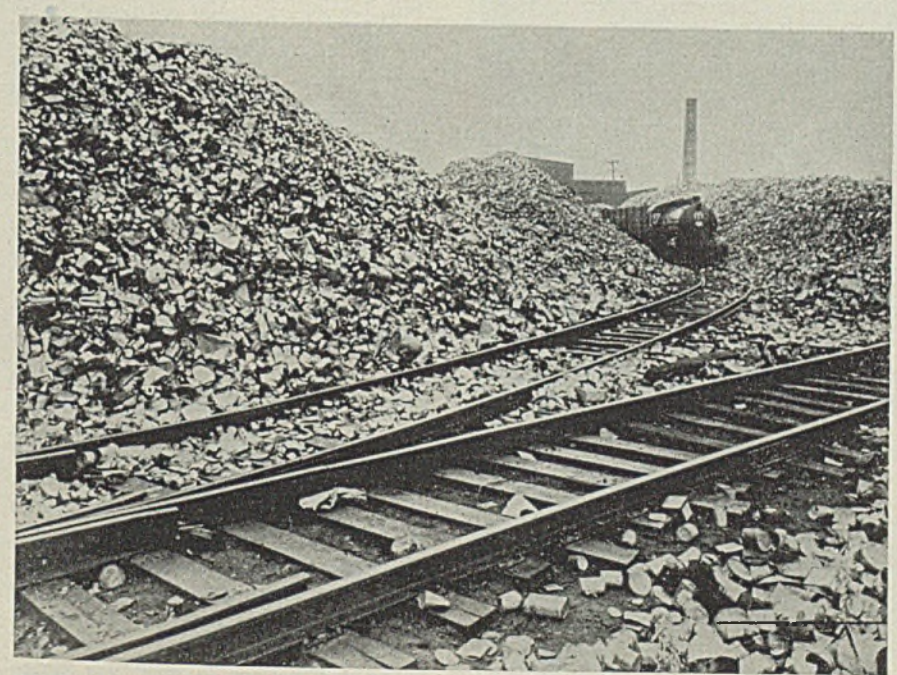
NATIONAL Dormant Scrap Committee of the steel warehouse industry has been organized to assist voluntarily the industrial salvage section, conservation division, War Production Board.

Continuing where the American Steel Warehouse Association's drive left off Dec. 31 a new duration scrap program has been inaugurated to extend the work started during the last three months of 1942. This program has been expanded to include all members of the steel warehouse industry and has the approval of the War Production Board. The program assures WPB the continued help of 1500 to 2000 qualified steel salesmen acting under their own sales managers and the local WPB salvage managers.

The committee is headed by J. J. Hill Jr., president-treasurer, Hill Chase & Co., Philadelphia. The five members of Mr. Hill's committee are: Harry Edgcomb, Edgcomb Steel Corp., Hillside, N. J.; L. B. Worthington, Scully Steel Products Co., Chicago; Harry K. Hamilton, Hamilton Steel Corp., Cleveland; Sol Freidman, Reliance Steel Corp., Cleveland; and Walter S. Doxsey, Cleveland, ex-officio member. The presentation and supervision of this program is the responsibility of John R. Hartman, executive chairman, Philadelphia.

In addition to the national committee to put the program into action, 13 regional chairmen have been appointed from the warehouse industry, each in charge of organization for his district. They are: J. A. Parsons, Edgar T. Ward's Sons Co., Boston; J. Frederick Rogers, Beals, McCarthy & Rogers Inc., Buffalo; Walter S. Ganong, Edgcomb Steel Corp., Hillside, N. J.; A. A. Ziegler, Morris Wheeler & Co., Philadelphia; C. E. S. Dickerson, Edgar T. Ward's Sons Co., Pittsburgh; Henry A. Lowry, Seaboard Steel & Iron Corp., Baltimore; Frank Pidgeon, Pidgeon-Thomas Iron Co., Memphis, Tenn; Henry Angsten, Corey Steel Co., Chicago; Henry Neef, Gage City Iron Works, Omaha; R. P. Mercer, Jacobs & Gile Inc., Portland, Oreg.; Harry Simon, Fougar, Ray & Simon, San Francisco; E. Jungquist, Percival Steel & Supply Co., Los Angeles; Rufus U. Lea, Woodward-Wright Co., New Orleans.

TIN CANS RUST IN SALVAGE CENTER



MOUNTAINS of tin cans rust on the property of a New Jersey detinning company, due to lack of facilities for processing them. Recently Burton M. Parks, who resigned from the WPB Salvage unit, charged that both the WPB and Mayor LaGuardia, New York, had helped to muddle the salvage drive and that much of the waste was due to failure to teach housewives how to prepare them properly. NEA photo

Damaged Military Arms Parts May Be Sold for Scrap

That defective or damaged parts of military arms discarded during manufacture may be disposed of as scrap, Limitation Order L-230 has been amended to permit sales and deliveries of the scrapped material to dealers and melters. Manufacturers who dispose of such material are required to file monthly reports with the War Production Board, giving the names and addresses of scrap dealers to whom the material is delivered. Detailed description of the scrap is not required, except on instructions from the director general for operations. Dealers delivering discarded parts to a melter are not required to report their disposition unless instructed to do so.

Half-Million Tons of Scrap From Western Pennsylvania

During the past six months the Industrial Salvage Branch of War Production Board has collected nearly 500,000 tons of scrap from industrial plants in western Pennsylvania. This resulted mainly from an industrial dormant scrap drive by the salvage branch, in charge of Alan S. Humphreys. The slogan of the drive to determine disposition was: "If it hasn't been used for the last three months and no one can prove it can be used in the next three, find a use for it or scrap it."

Top executives were enlisted in the effort and the interest of all supervisory workers was gained, plants being finely combed to search out all material eligible for scrapping.

$6,000,000 Foundry Pours First Steel

The new $6,000,000 government-built foundry of the Continental Roll & Steel Foundry Co., at East Chicago, Ind., was placed in operation at midnight Dec. 31, with pouring of the first steel. Construction of the plant, to produce turrets for tanks, was started eight months ago.

Tapping of the first heat was witnessed by officers of the Chicago Ordnance District, government officials and company executives. Representing the company were J. T. Osler, president and chairman; H. A. Forsberg, general superintendent; and Herbert Miller, superintendent of the plant. Company operates two other plants, both of which are producing war goods.

Will the Captain Continue To Be Captain of His Ship?

GREAT LAKES bulk vessel operators are facing a problem of transporting sufficient iron ore to accommodate the needs of war "which only can be accomplished with the blessing of Providence and the continuance of that same smoothly operating teamwork of everyone connected with the industry, which prevailed in 1942."

Elton Hoyt, Pickands Mather & Co., Cleveland, speaking for a large majority of the shipping industry, thus warned the National War Labor Board that if recommendations of a board panel for inauguration of a "hiring hall" on the Great Lakes were upheld the transportation of sufficient ore for the needs of war would be jeopardized.

"With the expansion program of the steel industry rapidly nearing completion, the War Production Board has indicated that requirements of this essential raw material in 1943 may reach the colossal figure of 100,000,000 tons or an average of 400,000 tons a day every day of the season, and this assumes that the season must be as long as that which prevailed in 1942."

Reviewing the accomplishments of the past season when a record 92,000,000 tons was moved, Mr. Hoyt said:

"The carrying capacity of the vessels in the iron ore bulk trade ranges from 4000 tons to over 17,000 tons. The average cargo is about 9000 tons. There were approximately 340 ships engaged in the ore trade in 1942, including 35 ships of Canadian registry, and to move 92,000,000 tons it required that approximately 10,200 vessels were loaded at the upper lake ports, or an average from the opening to the close of navigation of 40 ships per day."

Must Load 500,000 Tons Daily

This requires every day in the season of navigation that vessels carrying 361,000 tons must be dispatched from upper lake ports and in order to make this average from 500,000 to 600,000 tons a day must be loaded during periods of favorable weather.

"The total number of railroad cars in service for the mines and the upper lake docks is 33,000 cars of an average of 55-ton capacity, and it does not take any very careful mathematical calculation to realize that these cars must be in constant use every minute of the 24 hours in order to get the ore from the mines to the upper lake docks, a distance which varies up to 125 miles. The railroad will not name any cars to the mines unless a boat is named for the particular load in question and any interruption in the boat traffic for any reason results in immediately limiting the production of ore."

The achievement in 1942, he declared, was unusually benefited by the early opening of navigation to the extent that 8,600,000 gross tons had been loaded into vessels before May 1.

"The crews of the American ships handling the bulk lake traffic total some 11,500 men and with the addition to the fleet of the 16 Maritime vessels this number will be increased by over 500.

"During the entire year of 1942, as far as we know, there was not a minute's delay in the operation of the vessels due to labor troubles and it seems difficult to understand the necessity at this critical time of establishing the new methods of recruiting services of lake seamen.

"The captain is the master of the ship and with unusual responsibilities due to the narrow channels prevailing on the Great Lakes, where with the unending traffic of lake ships and the prevalence at certain seasons of the year of excessive fog makes the chances of accident and collision more imminent than in any other vessel system of transportation that we know of.

"The captain has always had the final responsibility of employing his crew and many men sail year after year on the same ship through loyalty and allegiance to the master or the junior officers. The co-operation and complete understanding between the officers of the vessel and its crew is an essential factor in the splendid record made by the lake fleet and it is our definite judgment that a system of hiring men *only* through union halls, where the first on the list is the first sent to fill a vacancy, will result in greatly limiting the ability of the lake ships to hold qualified and experienced men.

"We are satisfied that many of the most reliable men who have sailed on the lakes for years and who are dependent for the livelihood of themselves and their families on their ability to obtain a job, will, if they are required to wait their turn before they are sent to a ship, in all probability look elsewhere for jobs which are now available in the war industries everywhere throughout the Great Lakes region.

"In this connection, we wish to emphasize also that the future masters and officers for Great Lake ships are promoted from the rank and file of the crews and any method of recruiting seamen for the industry, which in any way might have a possible effect on the continuity of service, may seriously limit the ability to find qualified and experienced men for masters' and officers' positions in the future

"We are not discussing whether a man should or should not be a member of the union, or the experience of the hiring hall in vessel industries other than on the Great Lakes, but we are firmly convinced that no fundamental change in methods of employment should be contemplated when a moment's delay in the operation of the ship represents immediate loss of production of iron ore.

WMC Will Not Restrict Hiring to USES Offices

The War Manpower Commission does not intend to restrict all hiring and recruiting activities to the United States Employment Service, Chairman Paul V. McNutt announced last week.

"From time to time, reports have become current in some localities that the U. S. Employment Service is to be made the exclusive channel for all hiring," Mr. McNutt said. "Authority to make it an exclusive channel was granted by the President's executive order of Dec. 7. However, we are not contemplating such a step at this time.

"We intend to make use of all sound and proved facilities that will put the right workers in the right jobs at the right time. Union hiring halls and company personnel offices that are functioning on a sound basis should continue in operation. It is obviously essential, however, that their operation must serve total overall manpower objectives, following the policies of the War Manpower Commission and contributing to the establishment of an orderly labor market."

Advise Against Emergency Suspension of State Labor Laws

The War, Navy and Labor Departments, War Production Board, War Manpower Commission, Maritime Commission and Office of Defense Transportation have advised against blanket suspension of State labor laws.

Because of the effective use of power to grant variations to meet war emergencies, these agencies reported that State labor standards on hours and working conditions have not interfered with war production since it was recommended on Jan. 27, 1942, that State labor laws and regulations should be preserved un-

less there was a definite showing of emergency needs.

The federal agencies pointed out that, under this approved policy, temporary modification of certain labor standards has been permitted under proper safeguards and, at the same time, maximum long-time production has been aided by preserving laws regulating hours of work and establishing safe working conditions.

Unauthorized Strikes Handicap Metals Plants

Machinists on the day shift at New Kensington, Pa., plant of Aluminum Co. of America started an unauthorized strike last week in a dispute between members of the day and night shifts over rotation of work. Negotiations covering this point had been carried on between the company and union officials, and an agreement had been reached.

N. A. Zonarich, international president of the union, stated: "The workers have no justification for walking off the job and their action is unauthorized. Vital war production is being interrupted. The present shift rotation plan will be in effect for eight weeks and thereafter negotiations will resume to make any improvements found necessary."

Members of the United Steel Workers of America started an unauthorized strike Jan. 5 at the H. K. Porter Co. plant in Pittsburgh, in a controversy over starting pay for women employes. Representatives of the union, CIO affiliate, stated the strike was unauthorized and that they were endeavoring to persuade the strikers to work while their grievance is taken up through regular channels.

Construction on Carnegie-Illinois Steel Corp's expansion at Homestead and Duquesne works was held up by a strike of carpenters, demanding an increase to $1.75 per hour from the $1.50 rate being paid. Contractors were willing to grant the increase if permitted to add the cost to their price. Permission must be given by the Defense Plants Corp., and construction work will be delayed until DPC makes a decision.

This is the second time construction of new facilities has been held up by striking A. F. of L. workers. Operation of the new electric furnace unit at Duquesne was delayed several months by a jurisdictional dispute among electricians.

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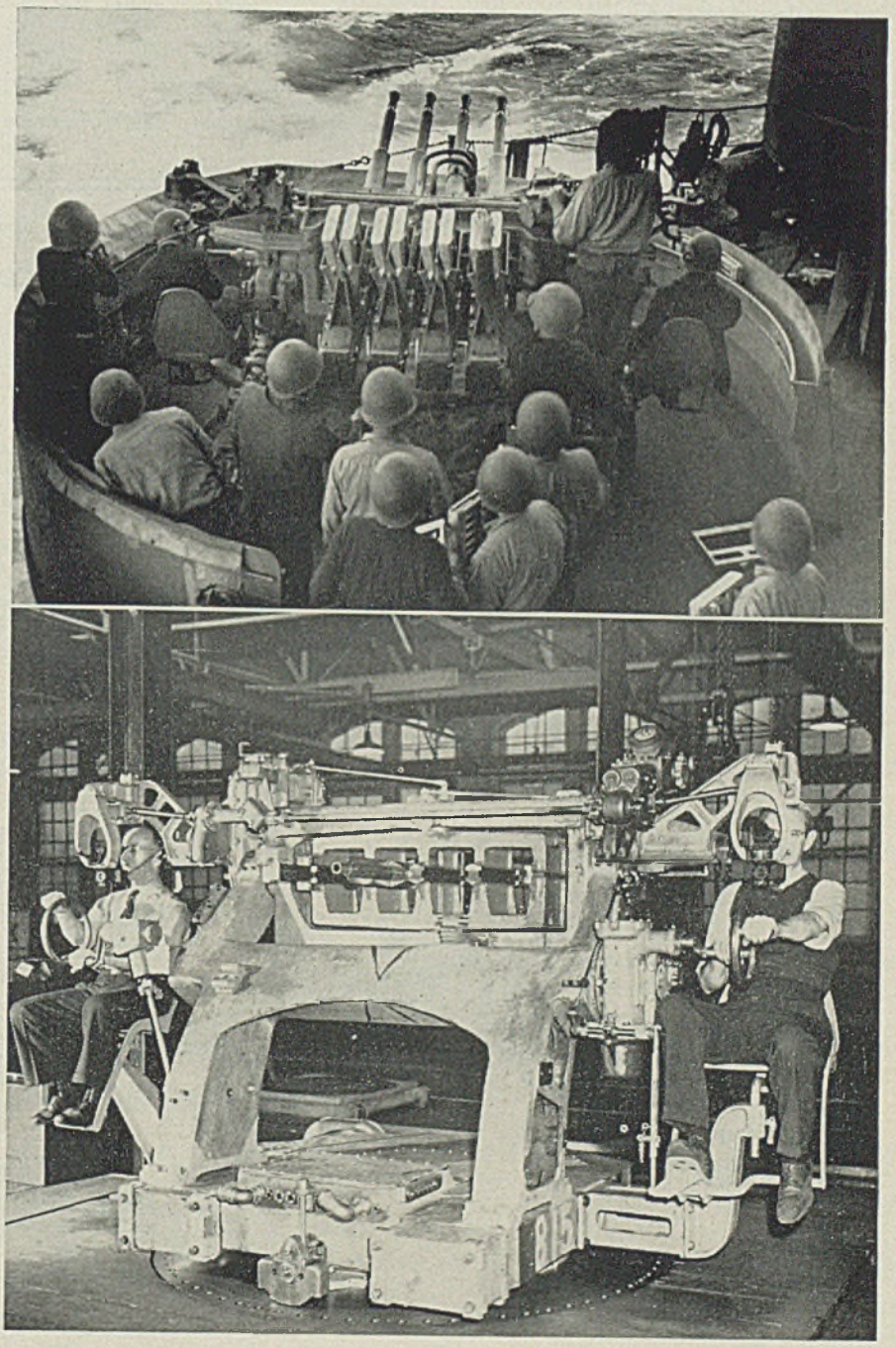
Steel Employment 3000 Less In November Than October

A total of 632,000 employes were on payrolls of the steel industry during November, American Iron and Steel Institute reports. This represents a drop of 3000 from October, and reflects the continuing downward trend in employment experienced by the industry in recent months. Employes in November a year ago totaled 645,000.

Companies in the steel industry distributed payrolls amounting to $122,816,000 in November, a decline from the total of $126,627,000 paid in October, a longer month. Payrolls for November, 1941, were $109,856,000.

Wage-earning employes earned an average of 109.3 cents per hour in November, 1942, compared with 107.7 cents in October, and 99 cents in November, 1941. An average of 39.4 hours per week was worked by wage earners in November; 39.9 in October, and 37.6 in November, 1941.



PRODUCTION time on gun mounts carrying four rapid-fire 1.1-inch anti-aircraft guns has been reduced from 8500 to 2100 man-hours, and cost from $27,000 to $12,000 by Westinghouse Electric Elevator Co., Jersey City, N. J. This was revealed recently when the company received its third official citation for war production, the Army-Navy "E" with two stars. The guns now have been installed on every type of American warship, are capable of throwing hundreds of shells a minute at enemy planes. Accompanying photos show, at top, the ack-ack in action; below, inspectors testing gun sights for alignment

United States' Production To Double Axis' by Middle of Year

DETAILED explanation of the complex planning of the steel expansion program, beginning with the raw materials and running from the blast furnaces to the open hearth, electric or bessemer furnaces, through the rolling or processing stages to semifinished products and finally the plates, bars or other finished products, was issued recently by the War Production Board.

In commenting on the exposition, WPB Chairman Donald M. Nelson said that by the middle of 1943 United States steel production will approach twice the combined output of the Axis nations. Total capacity by the middle of the year is estimated at 97,115,000 net tons.

Mr. Nelson paid high tribute to the industry and to the WPB Steel Division for the progress of the expansion program, pointing out that when the program is completed our monthly output rate will be about 8,100,000 tons a month.

Starting with raw materials, this is the way the program shapes up:

Raw Materials Required for Productive Capacity Available at Completion of Expansion Program
(Net Tons; 000 omitted)

	Jan. 1942	Dec. 1942	Present Program
Iron Ore	118,583	121,391	133,949
Coke	71,559	73,068	80,440
Limestone	29,300	30,780	34,716
Pig Iron	57,879	60,759	68,716
Recirculating Scrap Available	24,602	25,047	27,192
Purchased Scrap Needed	19,866	17,575	14,386

(Note that in the foregoing table and in those following, the War Production Board figures all materials in net tons, which, in some cases, is contrary to industry's practice).

How ingot capacities are expanding from the beginning of 1942 to the middle of 1943:

Productive Capacities
(Net Tons; 000 omitted)

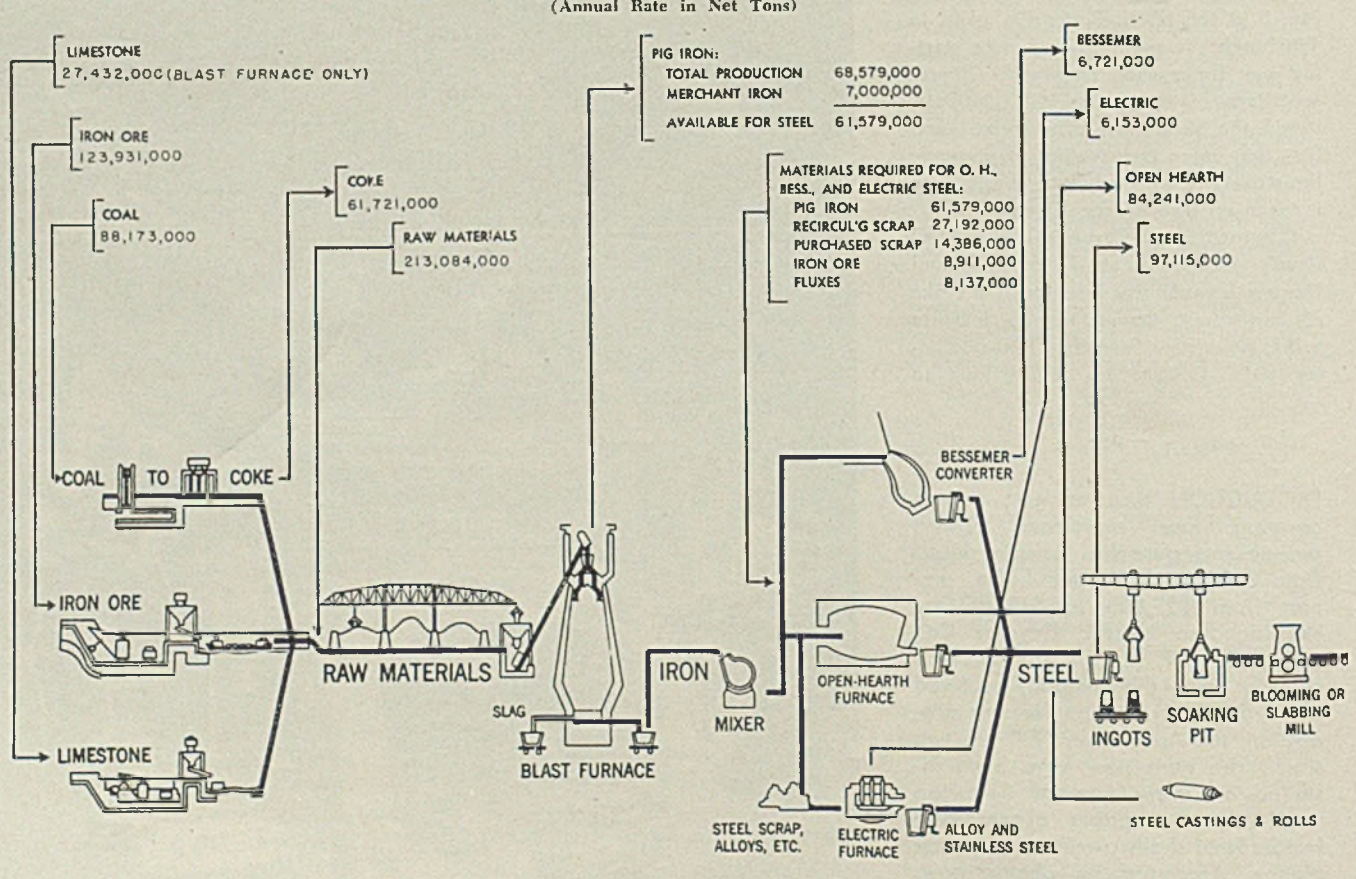
	Jan. 1942	Dec. 1942	Completed Program
Open Hearth	77,702	78,895	84,241
Bessemer	6,721	6,721	6,721
Electric	3,402	4,666	6,153
Total	87,825	90,282	97,115

Approximately 5,780,000 tons of finished products will be produced monthly when the ingot capacity reaches the 8,100,000-ton figure. Since there is a surplus of finishing facilities compared with ingot capacity, the production of finished products can be varied to meet shifting military demands. This shifting pattern in certain groups of prod-

STEELMAKING FLOW CHART

PRODUCTIVE CAPACITY WITH RAW MATERIALS REQUIRED AT COMPLETION OF EXPANSION PROGRAM DURING 1943

(Annual Rate in Net Tons)



ucts since the war started is illustrated in the following table.

Monthly Finished Steel Output
(Net Tons)

Product	Jan. 1942	Dec. 1942
Plates	750,000	1,110,000
Bars	1,050,000	950,000
Sheets and Strip	1,150,000	830,000
Structural Shapes	450,000	340,000
Rod and Wire	450,000	350,000

Decrease in four of these five products reflects the conversion of finishing facilities to the type of products needed in the war program.

Increased steelmaking capacity of course will require an increase in iron ore production in every producing section. The Lake Superior district is counted upon to supply the lion's share of the increase.

Consumption of ore currently is running at a rate of about 10,000,000 tons monthly. Past shipments and estimated future requirements are shown in the following table:

(Net tons; 000 omitted; Annual rate)

Source	Jan. 1, 1942	Dec. 1, 1942	Goal of Present Program
Texas & Mo.	22	56	896
Foreign	2,312	530	. . .
Eastern	3,696	4,144	6,160
Western	1,568	1,624	4,144
Southern	9,408	10,416	10,640
Lakes	101,577	104,621	112,109
Total	118,583	121,391	133,949

Coke production will be increased by 7,084,000 net tons by July by new plants either now producing or to be brought in by the middle of the year. Capacity at the beginning of last year was 50,064,000 tons; at the beginning of this year, 51,109,000 tons; and by July of this year will be 57,148,000 tons. At the end of the program, this will be supplemented by 14,292,000 tons from merchant by-product ovens and 9,000,000 tons from beehive ovens.

Blast furnace capacity will have been increased by 11,018,000 tons from Jan. 1, 1942, when it was 59,832,000, to 70,850,000 tons on Aug. 31, this year. As of Dec. 31, capacity was rated at 64,440,000 tons.

Of the total blast furnace capacity increase, new stacks account for 8,253,000 tons, and rehabilitation, enlargements and improvements for the remainder.

Electric furnace capacity, important in the production of alloy steels, amounted to 3,402,000 tons at the beginning of 1942.

During last year, new facilities with a capacity of 970,000 tons have been added. Increases amounting to 294,000 tons, resulting from improved equipment and techniques, bring the total productive capacity at the end of 1942 to 4,666,000 tons.

Additional new facilities to be brought into production by June, 1943, will bring the total electric furnace capacity at the end of program to approximately 6,153,000 tons.

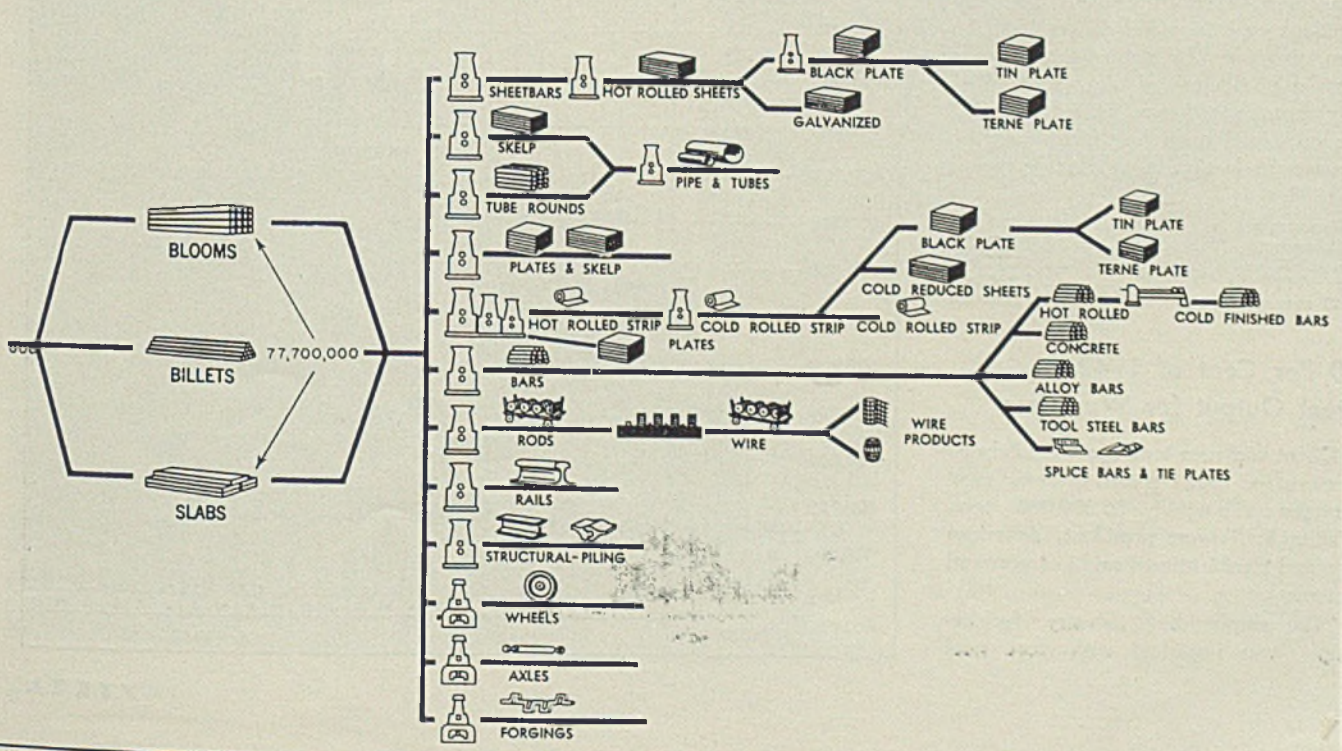
No expansion in the capacity of bes-

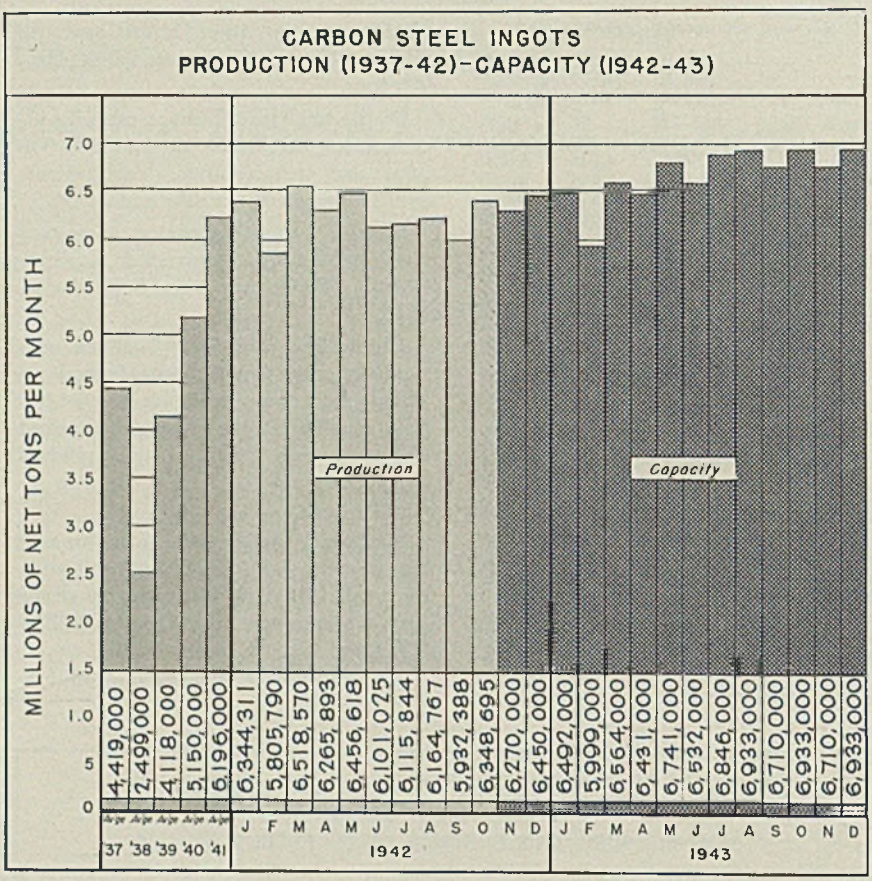
This flow chart of steelmaking, indicating raw materials required and amounts and types of products to be produced, was projected by the War Production Board to the middle of this year when the present expansion program is to be completed. At that time it is estimated this country's production will be approximately twice that of the Axis

POSSIBLE DISTRIBUTION OF APPROXIMATELY 8,100,000 INGOT TONS PER MONTH CAPACITY TO SEMI-FINISHED AND FINISHED STEEL PRODUCTS

PRODUCT	N.T. PER MONTH
Semi Finished (For shipment)	700,000
Structural Shapes	375,000
Plates	1,300,000
Rails	185,000
Bars	1,000,000
Pipe and Tubes	430,000
Rod and Wire	370,000
Tin and Terne Plate	250,000
Sheet and Strip	900,000
Miscellaneous	270,000
Total	5,780,000

(69,000,000 Net Tons Annually)





semer converters is planned. Capacity of these furnaces is 6,721,000 ingot tons annually.

Alloy steel, essential in the production of armor plate and machine tools, continues to show a steady gain in production. Production in 1938 averaged only 137,791 tons monthly. This rate doubled in 1939, and increased steadily thereafter.

The larger part of alloy steel production is in the open hearth. The tremendous gains in production can best be seen, therefore, by noting that electric furnace production of alloy steel alone in a recent month was more than twice the combined open hearth and electric furnace production in an average month of 1938.

1938 average	137,791
1939 average	270,000
Jan. 1942	736,000
Dec. 1942	1,130,000
1943 average (est.)	1,230,000

60 Per Cent of 1942 Steel Output for War Uses

Direct war uses took approximately 60 per cent of 1942's record-breaking steel production of 86,200,000 tons, Walter S. Tower, president, American Iron and Steel Institute, said in a year-end statement.

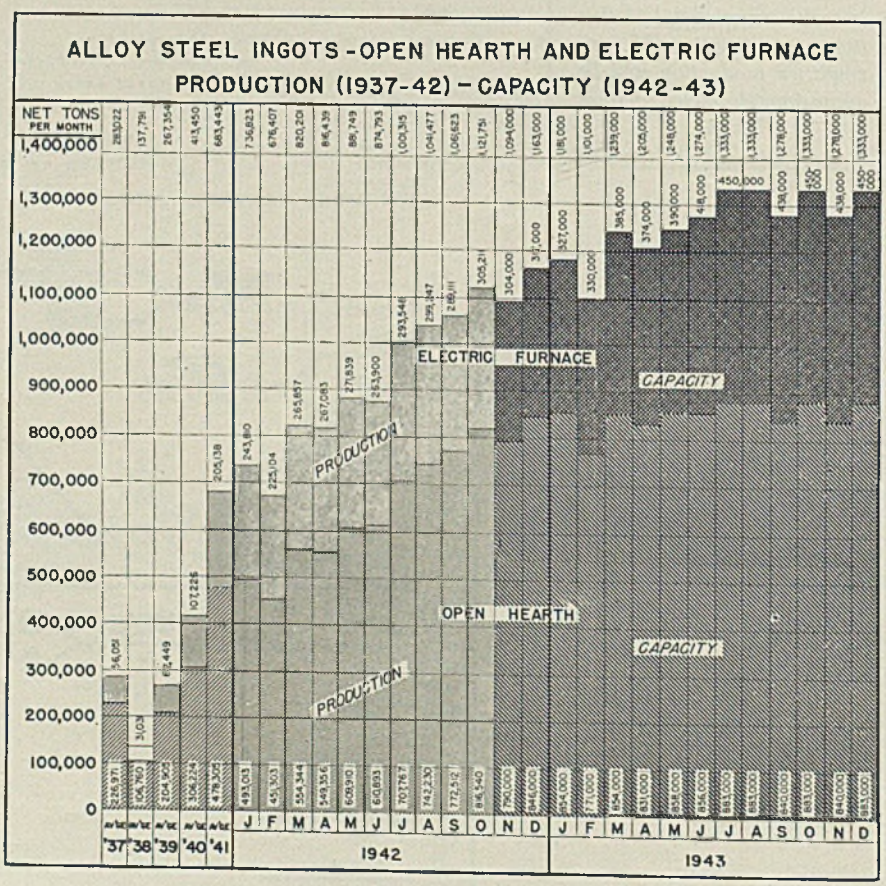
"The shipbuilding industry, for example, was furnished with more steel than the automobile industry ever consumed in any year. However, industries which primarily serve basic civilian needs of the country, as well as contribution to the war effort, also received steel in substantial tonnages during the year under priorities and allocations from the War Production Board.

"Thus shipments of steel in 1942 to the railroads, public utilities and can manufacturers were not far below the high mark of 1941 and in some cases exceeded shipments to the same industries in 1940."

More Zinc Output but Less for Galvanizing

That zinc production will be increased 40 per cent in 1943 is the prediction of Lieut. Com. W. H. Spowers Jr., of the Bureau of Ships, United States Navy. Effective measures taken early in 1942 increased supply from 910,000 tons to an estimated 1943 production of 1,282,000 tons. New highs have been established during the past three years, official American Zinc Institute total for 1940 being 706,100 tons and for 1941 it was 863,955 tons. The 1929 production of 631,601 tons had stood as the peak until 1940. Official zinc production statistics have not been issued since May, 1942, when they went under censorship ban.

Despite larger production, Commander Spowers states that galvanizers probably will receive less metal.



Defense Plant Corp. Approves Plant Expansions, Equipment

NEW war plant facilities and expansions recently authorized by Defense Plant Corp. have been announced by Jesse Jones, Secretary of Commerce. Defense Plant Corp. will retain title to the facilities, which will be operated by the private companies. They include:

Execution of a contract with Kohler Co., Kohler, Wis., at a cost of more than $2,500,000.

Execution of a contract with Sheffield Corp., Dayton, O., to provide plant facilities in Ohio at a cost in excess of $200,000.

Execution of a contract with Chicago Pneumatic Tool Co., New York, to provide machinery and equipment in a plant in Ohio at a cost in excess of $200,000.

An increase in its contract with Hooker Electrochemical Co., Niagara Falls, N. Y., to provide additional plant facilities in Washington, making an overall commitment of more than $200,000.

Execution of a contract with the California Rock Salt Co., Los Angeles, to provide equipment for a plant in California at a cost in excess of $300,000.

Execution of a contract with the May-Fran Engineering Co., Cleveland, to provide equipment in a plant in Ohio.

$800,000 for Square D Co.

An increase in its contract with Square D Co., Elmhurst, Long Island, N. Y., to provide additional plant facilities in New York at a cost in excess of $200,000, making an overall commitment of more than $800,000.

Execution of a contract with E. I. du Pont de Nemours & Co., Wilmington, Del., to provide facilities for a plant in New Jersey at a cost in excess of $1,000,000.

Execution of a contract with Sundstrand Machine Tool Co., Rockford, Ill., to provide equipment in a plant in Illinois at a cost in excess of $200,000.

Execution of a contract with International Business Machines Corp., New York, to provide equipment for a plant in New York at a cost in excess of $300,000.

Execution of a contract with Old Times Distillery Co. Inc., Ekron, Ky., to provide equipment for a plant in Kentucky.

Execution of a contract with the Airox Co., Los Angeles, to provide equipment for a plant in California at a cost in excess of $100,000.

Increase in its contract with Douglas Aircraft Co., Santa Monica, Calif., to provide additional plant facilities in California at a cost in excess of $600,000, making an overall commitment in excess of $9,000,000.

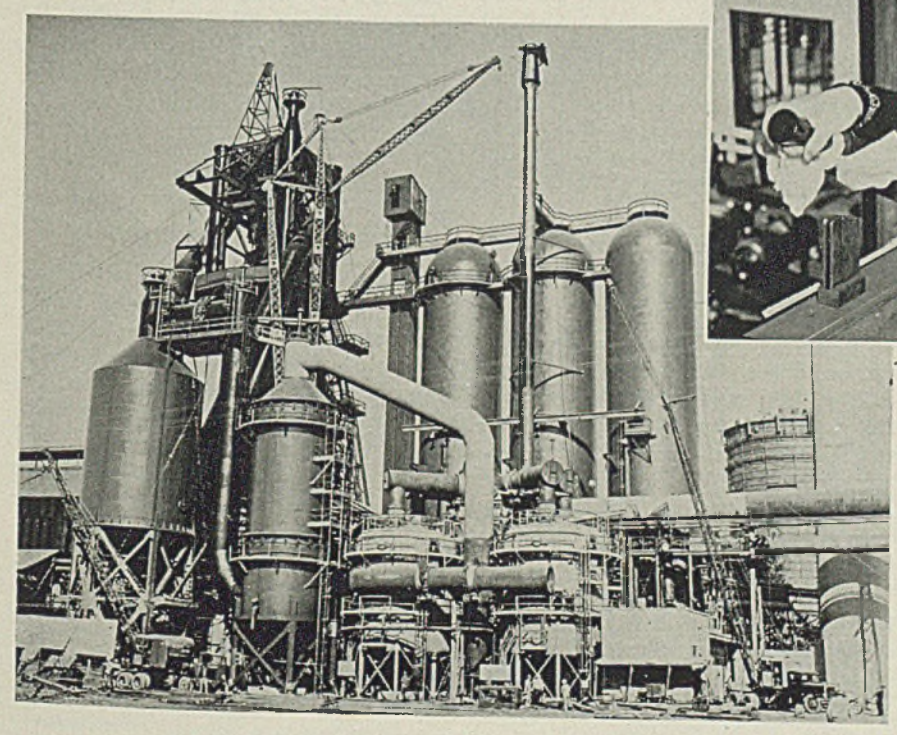
Increase in its contract with Weston Electrical Instrument Corp., Newark,

FONTANA FURNACE LIGHTED; FIRST IN PACIFIC COAST STEEL PLANT

KAISER CO.'S 1200-ton blast furnace stack at Fontana, Calif., was blown in Dec. 30, "first unit of the first integrated steel plant" on the Pacific Coast. Other units are under construction; description of plans and progress will be presented in an early issue of STEEL.

Meanwhile, lighting the furnace was considered an epochal event for the Coast where an "impractical dream" is distilling into reality over war-time heat.

Illustrations show the blast furnace; Henry J. Kaiser, and wife who closed a switch starting production. A tradition was observed when the furnace was christened "Bess", for Mrs. Kaiser.



The $83,000,000 plant, when completed "in a few months", will include two batteries of 45 by-product coke ovens each, six 185-ton basic open-hearth furnaces, 110-inch plate mill. Company plans to add a structural mill, a merchant mill and alloy finishing capacity "some time in the future."

Iron ore obtained from Vulcan mine in California is shipped to the plant for crushing, screening, and sintering. Coking coal is brought from Utah.

N. J., for additional plant facilities in New Jersey at a cost in excess of $500,000, resulting in an overall commitment of more than $1,000,000.

Execution of a contract with the Ford Motor Co., Dearborn, Mich., to provide plant facilities in Michigan at a cost in excess of $1,000,000.

Execution of a contract with Aerovox Corp., New Bedford, Mass., to provide plant facilities in Massachusetts at a cost in excess of $300,000.

Execution of a contract with Diamond Iron Works Inc., Minneapolis, to provide additional equipment in a plant in Minnesota.

Increase in its contract with Ford Motor Co., Dearborn, Mich., to provide additional machinery and equipment in various plants in Michigan, New York and Ohio, at a cost in excess of $5,000,000, making an overall commitment of more than $39,000,000

Increase in its contract with Aluminum Forgings Inc., Buffalo, to provide additional equipment in a plant in Pennsylvania, resulting in an overall commitment in excess of $8,000,000.

Execution of contract with Farm Crops Processing Corp., Lincoln, Nebr., to provide plant facilities in Nebraska at a cost in excess of $1,500,000.

Execution of contract with J. I. Case Co., Racine, Wis., to provide for the installation of equipment and conversion of plants in Wisconsin, Illinois, and Iowa, at a cost in excess of $2,500,000.

Execution of contract with the Palmer-Bee Co., Detroit, to provide equipment and machinery in a plant in Michigan, at a cost of more than $700,000.

Execution of contract with Spencer Wire Co., Spencer, Mass., to provide equipment in a plant in Massachusetts.

Execution of contract with Taylor & Williams Distilleries Inc., Louisville, Ky., to provide equipment for a plant in Kentucky.

Increase in contract with North American Aviation Inc., Dallas, Tex., to provide additional plant facilities in Texas at a cost of more than $1,250,000, resulting in an overall commitment in excess of $34,000,000.

Increase in contract with Tube Turns Inc., Louisville, Ky., to provide additional equipment in a plant in Kentucky at a cost in excess of $400,000, resulting in an overall commitment in excess of $1,500,000.

Increase in contract with Douglas Aircraft Co. Inc., Santa Monica, Calif., to provide additional facilities at a plant in California, at a cost of more than $300,000, resulting in an overall commitment which will exceed $2,000,000.

Execution of a contract with American Bantam Car Co., Butler, Pa., to provide equipment for a plant in Pennsylvania.

Execution of a contract with Cold Spring Granite Co., Cold Spring, Minn., to provide equipment for a plant in Minnesota.

Execution of a contract with Lion Oil Co., El Dorado, Ark., to provide plant facilities in Arkansas at a cost in excess of $1,000,000.

Execution of a contract with United States Radiator Corp., Detroit, to provide plant facilities in New York at a cost of more than $800,000.

Execution of a contract with McCord Radiator & Mfg. Co., Detroit, to provide equipment in a plant in Michigan.

An increase in its contract with Eaton Mfg. Co., Cleveland, to provide additional machinery and equipment for a plant in Ohio at a cost in excess of $100,000, resulting in an overall commitment of more than $700,000.

Execution of a contract with Columbia Steel Castings Co., Portland, Oreg., to provide plant facilities in Oregon at a cost in excess of $700,000.

Execution of a contract with Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., to provide plant facilities in Pennsylvania at a cost of more than $600,000.

Increase in its contract with United Aircraft Corp., East Hartford, Conn., to provide further expansion of a plant in Connecticut resulting in an overall commitment in excess of $2,300,000.

Increase in contract with Southern California Gas Co., Los Angeles, to provide additional plant facilities in California at a cost of more than $500,000, resulting in an overall commitment in excess of $4,000,000.

Increase in contract with Shell Chemical Co., San Francisco, to provide additional machinery and equipment in California at a cost in excess of $5,000,000, resulting in an overall commitment of more than $14,000,000.

Victory Promotions Plan Sponsored by N.I.A.A.

For more co-ordination in war production drives, conservation, industrial training, and war-winning advertising, the National Industrial Advertisers Association, Chicago, is sponsoring a "Victory Promotions Plan". Members are pooling information and exchanging records of successful attempts to promote these objectives.

Among those found effective in aiding production drives have been posters, contests and slogans, films and pictures of war activities, suggestion boxes, charts, bulletin boards, photographs of what the company is doing or making to help win the war, and use of the employes' house organ to describe war activities.

Training the new workers required may be aided by motion pictures, instruction manuals, engineering handbooks and similar devices.

Suggestions for co-operation with salvage drives and conservation campaigns likewise is included in the plan, as is a program of war-winning advertising.

Wilmer H. Cordes, American Steel & Wire Co., Cleveland, is the association's vice president in charge of war activities. Chairman of the war production promotions is Morgan Fenley, Eaton Mfg. Co., Cleveland; chairman of industrial training is Lansing Moore, Holden Stedman & Moore Inc., Detroit; chairman of war-winning advertising is Edward H. Peplow Jr., John A. Roebling's Sons Co., Trenton, N. J.; and of conservation and scrap salvage, Walter H. Gebhardt, Henry Disston & Sons Inc., Philadelphia.

Rickenbacker To Address Automotive Engineers

Capt. Edward V. Rickenbacker, president of Eastern Air Lines, and miraculously rescued on a South Pacific military mission recently, has accepted an invitation to address the Society of Automotive Engineers, at Detroit, Jan. 22.

Chairman of the committee handling arrangements is L. P. Fisher, vice president of General Motors Corp. Members assisting him are C. E. Wilson, C. F. Kettering and D. R. Berlin, of General Motors; F. W. Marschner, New Departure Division of General Motors; K. T. Keller, F. M. Zeder and J. C. Zeder, of Chrysler Corp.; Edsel Ford and R. H. McCarroll, of Ford Motor Co.; Alvan Macauley and E. H. Smith, Packard Motor Car Co.; and E. W. Austin, Timken Roller Bearing Co.

Cites Transportation Savings by Steel Industry

Considerable transportation savings have been effected by the steel industry as a result of the issuance of ODT Order No. 18, requiring maximum loading of freight cars, according to H. G. Batcheller, director, WPB Steel Division.

"A survey of actual shipping conditions, just completed, shows a reduction of more than 10,000 freight cars a month, representing a reduction of at least 3,000,000 freight car miles monthly," Mr. Batcheller said.

He called attention to the fact that this saving had been achieved despite the increased production of steel products being shipped.

Activity Index Reflects Holiday Interruptions

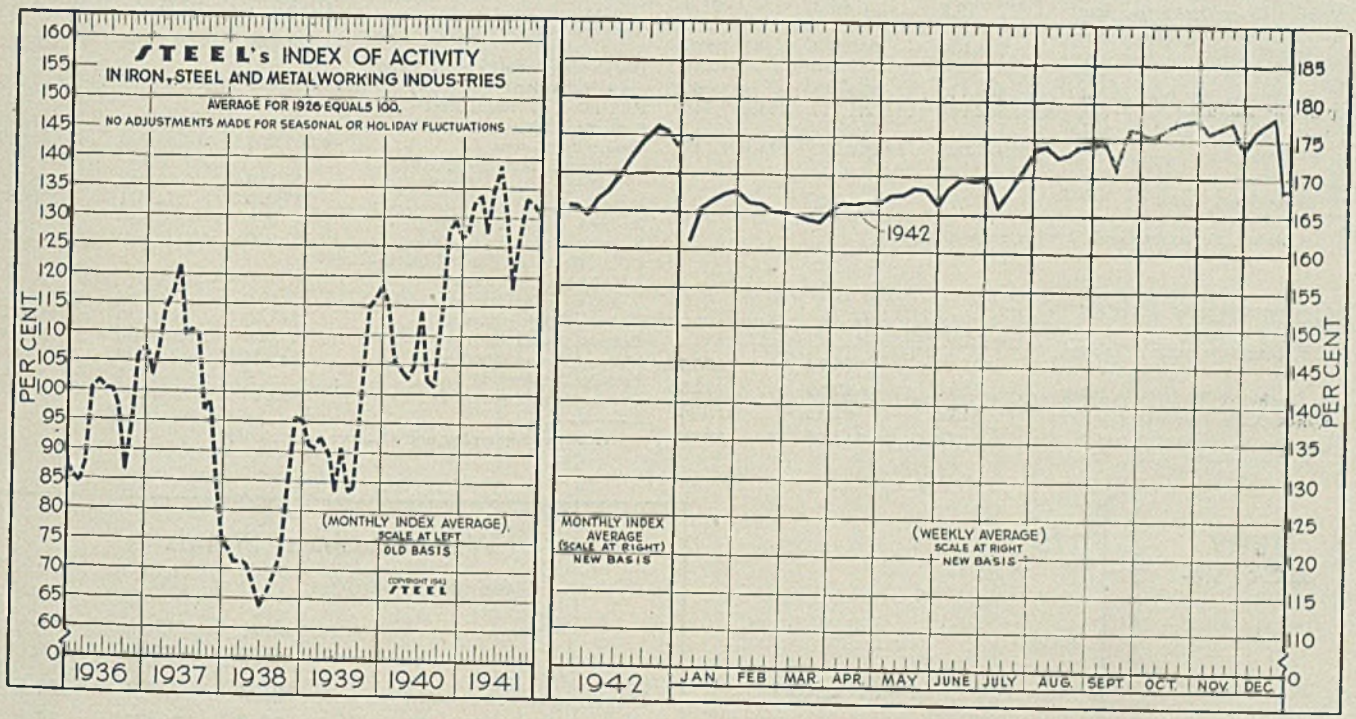
INDUSTRY enters the second year of war with more than ample plant manufacturing capacity in relation to supply of strategic materials and manpower. It appears probable that throughout 1943 the emphasis will be placed on achieving the highest volume of munitions output from present operating facilities.

Output of military goods still is well below the projected peak but is expected to climb steadily over the coming months. WPB estimates war expenditures will exceed $90 billion in 1943, compared with $52 billion last year. Expenditures for war quadrupled in 1941 and tripled in 1942.

Reflecting holiday interruptions STEEL's index of activity turned sharply downward during closing weeks of 1942. It now stands at 168.7, compared with 114.5 in the like week a year ago. A new peak of 178.0 had previously been established by the index during the week ended Dec. 19. It is expected to record a sharp rebound to about the previous high in the week ended Jan. 9.

Steel ingot production was curtailed in the period ended Jan. 2, reflecting flood conditions which cut operations at Ohio Valley steel plants from Wheeling to Cincinnati. Output had returned to normal by the close of last week. Steel mill operators report sufficient scrap stocks to sustain practical capacity operations, but are hesitant to say that present inventories together with anticipated collections will carry them through the winter months.

Revenue freight carloadings during 1942 gained only 1.3 per cent over the preceding year. However on a ton-mile basis the railroads transported 33 per cent more freight last year than in 1941. Total carloadings of coke in 1942 were up 7.9 per cent; coal, 10.2; iron ore, 12.3; live stock, 14.4; grain and grain products, 7.8; while mer-



STEEL's index of activity gained 0.5 point to 168.7 in the week ending Jan. 2:

Week Ended	1942	1941
Nov. 7	175.6	134.4
Nov. 14	176.2	133.8
Nov. 21	177.3	128.4
Nov. 28	174.0	132.2
Dec. 5	177.1	133.4
Dec. 12	177.6	134.0
Dec. 19	178.0	132.9
Dec. 26	168.2†	120.5
Week Ended	**1943**	**1942**
Jan. 2	168.7†	114.5

†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.	175.8	132.2	129.5	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4
Dec.	173.9	130.2	126.3	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3

Note: Weekly and monthly indexes for 1942 and 1943 have been adjusted to offset the forced curtailment in automobile production and to more accurately reflect expanding steel production

chandise, L.C.L. was off 30.6 per cent. The thirteen Shippers' Advisory Boards estimate that actual carloadings during the first quarter will be 3.4 per cent above like 1942 period.

Early estimate of electric power consumption for the latest period shows a slight gain to about 3,725,000,000 kilowatts. Compared with the like period a year ago power output is up 12.8 per cent. In some quarters it is feared that a serious shortage in electric power production will develop early in 1944 unless additional industry expansion programs are inaugurated.

Reflecting the steady downward trend in building awards during recent months, shipments of fabricated structural steel have declined sharply. Structural steel fabricators and rolling mills are entering a lean year with order backlogs expected to be virtually exhausted by April.

Machine tool orders continue to decline, but shipments have recorded further gains in recent weeks.

BUSINESS BAROMETER

Financial Indicators

	Nov., 1942	Oct., 1942	Nov., 1941
30 Industrial Stocks†	115.31	113.51	116.91
20 Rail Stocks†	28.13	28.65	27.92
15 Utilities†	14.16	13.35	15.93
Average Price of all listed bonds (N.Y.S.E.)	$96.11	$96.48	$94.80
Bank Clearings daily average (000 omitted)	$1,331,298	$1,274,455	$1,265,959
Commercial Paper, interest rate (4-6 months)	0.69%	0.69%	0.50%
Com'l loans (000 omitted)°	$10,295,000	$10,320,000	$11,259,000
Federal Reserve ratio (per cent)	79.1	81.5	91.0
Capital flotations (000 omitted)†:			
New Capital	$28,265	$45,085	$132,899
Refunding	$86,856	$55,893	$167,287
Federal gross debt (mil. of dol.)	$96,116	$92,905	$55,066
Railroad earnings†	$184,680,008	$154,631,717	$94,047,846
Stock sales, New York Stock Exchange	13,437,025	15,932,595	15,047,142

†Dow-Jones series.
°Leading member banks Federal Reserve System.
‡October, September and October respectively.

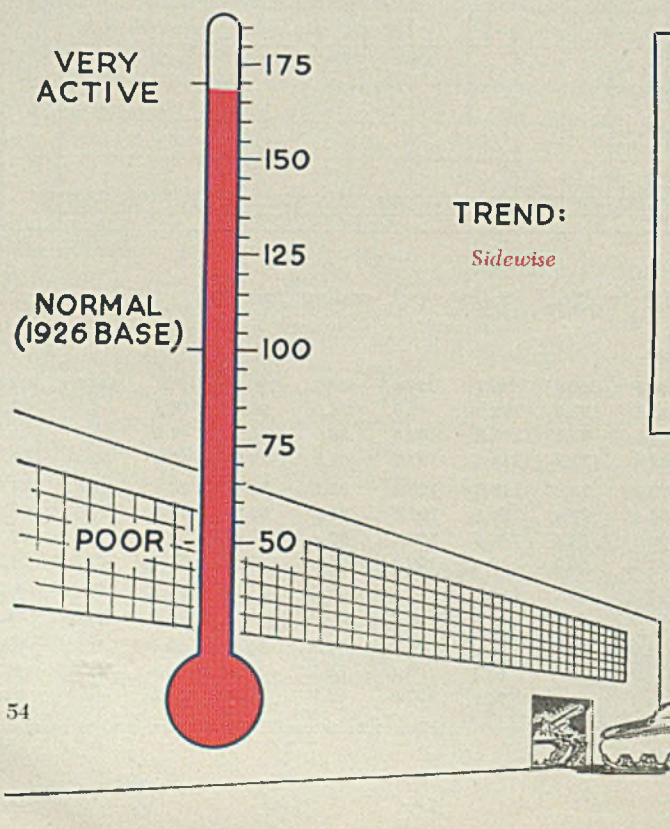
Commodity Prices

STEEL's composite finished steel price average	$56.73	$56.73	$56.73
U. S. Bureau of Labor's index	100.3	100.0	92.5
Wheat, cash (bushel)	$1.32	$1.32	$1.133
Corn, cash (bushel)	$1.09	$1.065	$0.75

Industrial Indicators

	Nov., 1942	Oct., 1942	Nov., 1941
Commerce Dept.'s Mfgs. Index†			
Orders	271.0	264.0	193.0
Shipments	231.0	224.0	183.0
Inventories	179.9	175.4	148.2
Munitions Output Index (WPB)	431	385	100
Iron and Steel Scrap consumption (tons)	4,621,000	4,883,000	4,482,000
Gear Sales Index	359	263	241
Foundry equipment new order index	338.8	540.6	408.5
Finished steel shipments (Net tons)	1,703,570	1,788,650	1,664,227
Ingot output (average weekly; net tons)	1,674,723	1,712,159	1,622,584
Dodge bldg. awards in 37 states ($ Valuation)	$654,184,000	$780,396,000	$458,620,000
Fabricated structural steel shipments (Tons)	127,052	147,290	182,593
Coal output, tons	46,800,000	51,065,000	44,426,000
Coke Production (Daily Ave.)			
Beehive	22,140	23,148	18,700
By-Product	173,029	172,211	161,300
Business failures; number†	673	556	809
Business failures; liabilities†	$7,181,000	$5,473,000	$7,333,000
U. S. Dept. of Labor (90 industries, factory):			
Av. wkly. hrs. per worker†	43.6	43.4	41.1
Av. weekly earnings†	$45.26	$44.45	$32.89
Cement production, bbls.	16,241,000	18,263,000	14,931,000
Cotton consumption, bales	913,038	972,490	849,143
Freight Car Awards	0	0	2,222
Car loadings (weekly av.)	809,000	902,000	856,000

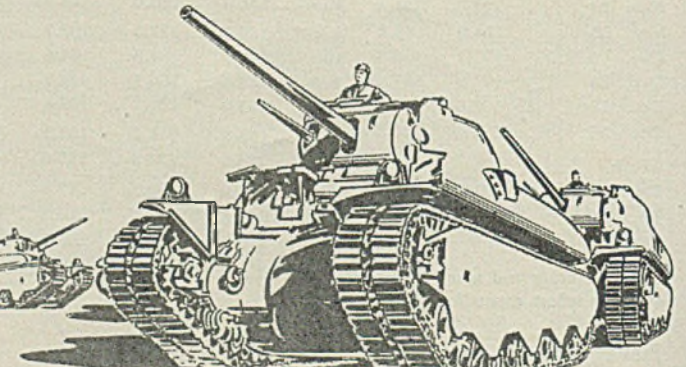
†October, September and October respectively.



Where Business Stands

Monthly Averages, 1941 = 100

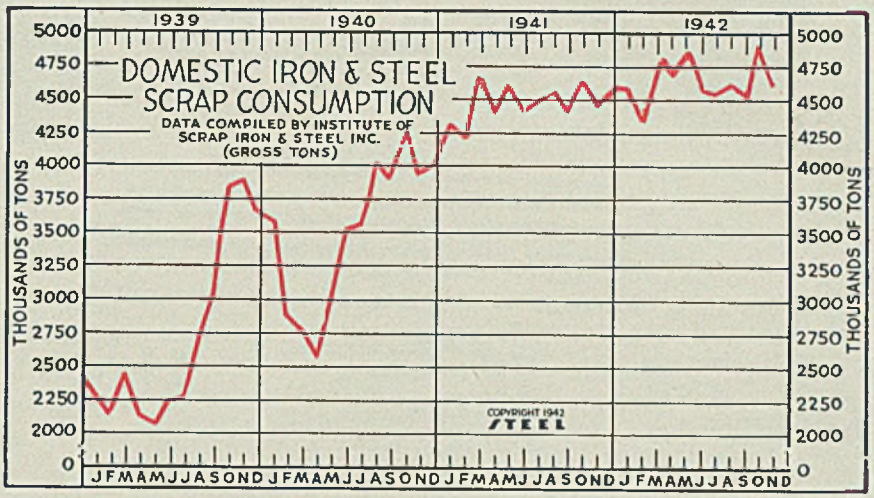
	Nov., 1942	Oct., 1942	Nov., 1941
Steel Ingot Production	105.3	107.7	102.0
Finished Steel Shipments	99.9	104.9	97.6
Structural Steel Shipments	67.2	78.2	97.3
Freight Carloadings	99.5	110.8	105.3
Building Construction	130.7	155.9	91.6
Wholesale Prices	114.9	114.5	106.0

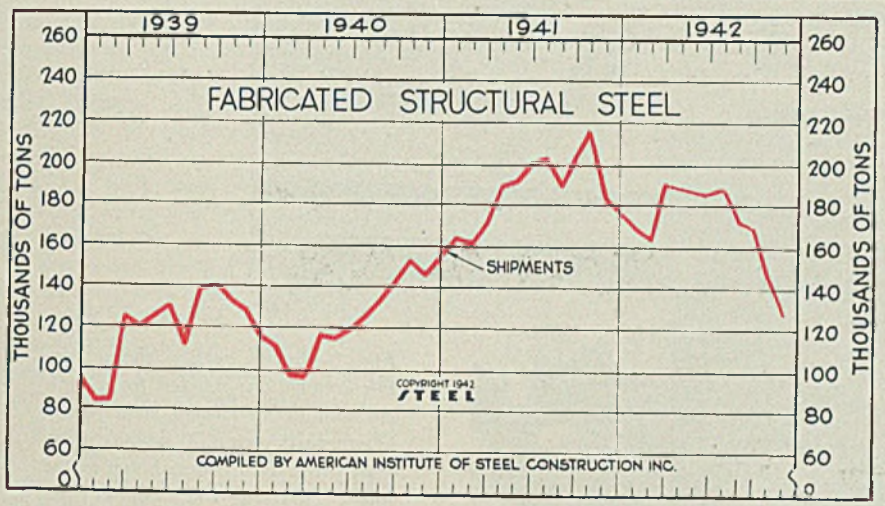


Iron and Steel Scrap Consumption

(Gross Tons)

	1942	1941	1940	1939
		(000 omitted)		
Jan.	4,590	4,278	3,581	2,257
Feb.	4,276	4,172	2,812	2,124
Mar.	4,840	4,662	2,728	2,419
Apr.	4,672	4,406	2,548	2,114
May	4,857	4,609	3,061	2,079
June	4,608	4,406	3,482	2,221
July	4,600	4,415	3,526	2,247
Aug.	4,645	4,518	3,968	2,675
Sept.	4,556	4,392	3,876	3,018
Oct.	4,883	4,649	4,233	3,809
Nov.	4,621	4,482	3,922	3,858
Dec.	....	4,634	3,950	3,613
Total	....	53,623	41,687	32,434
Mo. Av.	....	....	3,474	2,703





Fabricated Structural Steel

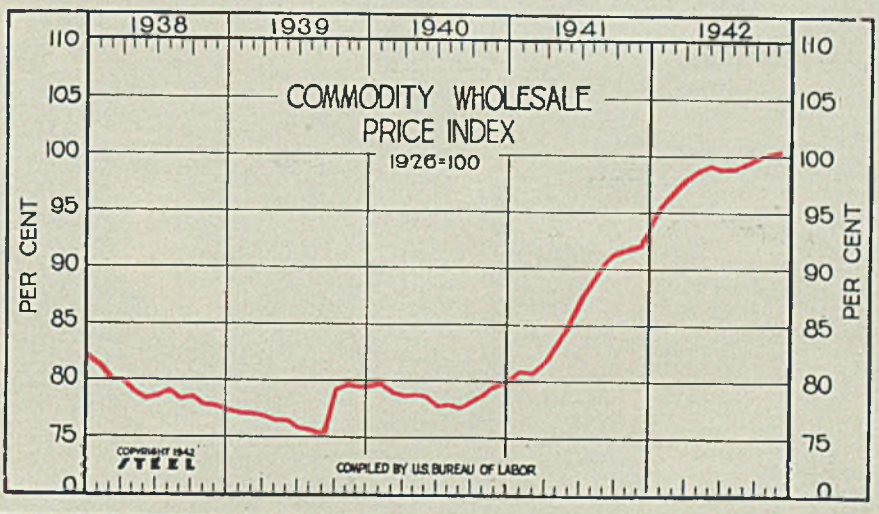
(1000 tons)

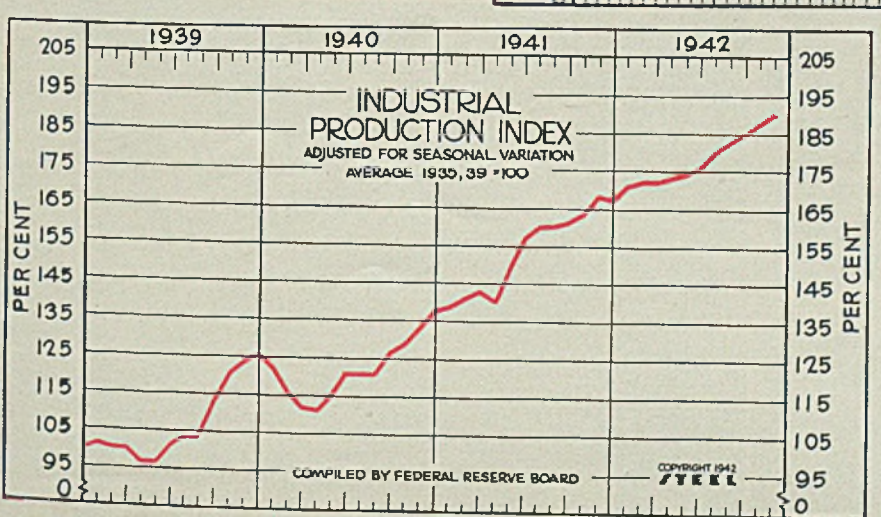
	Shipments			Bookings		
	1942	1941	1940	1942	1941	1940
Jan.	167.8	164.6	110.9	183.4	281.2	81.7
Feb.	164.6	161.4	97.2	228.7	173.6	98.9
Mar.	191.3	170.2	95.9	248.3	206.1	128.3
Apr.	187.2	189.8	116.3	314.0	218.0	73.8
May	184.2	191.9	115.6	161.0	179.9	126.8
June	182.7	200.5	119.1	184.5	246.9	109.7
July	189.9	203.0	127.1	125.2	214.8	194.9
Aug.	173.9	189.3	134.9	80.6	158.7	122.5
Sept.	169.8	204.1	142.8	68.5	158.8	225.5
Oct.	147.3	217.7	153.2	48.0	128.7	233.1
Nov.	127.1	182.6	147.0	46.0	184.0	141.9
Dec.	....	176.1	155.5	....	146.4	203.1
Tot.	....	2251.1	1515.5	....	2297.0	1748.1

All Commodity Wholesale Price Index U. S. Bureau of Labor

(1926 = 100)

	1942	1941	1940	1939	1938
Jan.	96.0	80.8	79.4	76.9	80.9
Feb.	96.7	80.6	78.7	76.9	79.8
March	97.6	81.5	78.4	76.7	79.7
April	98.7	83.2	78.6	76.2	78.7
May	98.8	84.9	78.4	76.2	78.1
June	98.6	87.1	77.5	75.6	78.3
July	98.6	88.8	77.7	75.4	78.8
Aug.	99.2	90.3	77.4	75.0	78.1
Sept.	99.6	91.8	78.0	79.1	78.3
Oct.	100.0	92.4	78.7	79.4	77.6
Nov.	100.3	92.5	79.6	79.2	77.5
Dec.	...	93.6	80.0	79.2	77.0
Ave.	...	87.3	78.5	77.1	78.6





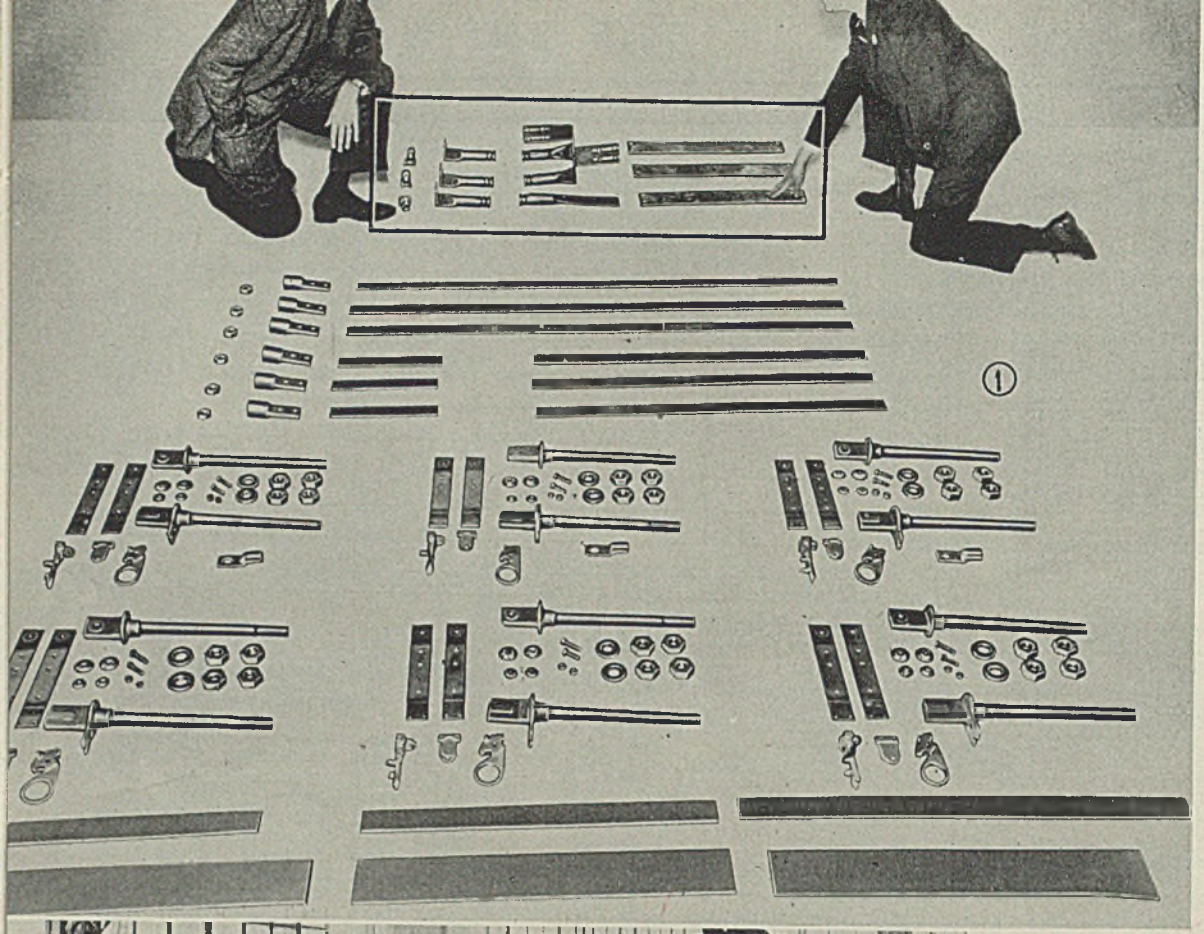
Industrial Production Federal Reserve Board's Index

(1935-39 = 100)

	1942	1941	1940	1939	1938
Jan.	171	139	122	102	86
Feb.	172	141	116	101	84
March	172	143	112	101	84
April	173	140	111	97	82
May	174	150	115	97	80
June	176	157	121	102	81
July	180	160	121	104	86
Aug.	183	160	121	104	90
Sept.	185	161	127	113	90
Oct.	189	163	129	121	95
Nov.	191	168	133	124	100
Dec.	...	167	138	126	101
Year Ave.	...	154	122	108	88

steel

By L. F. DYTRT
Switchgear Equipment Division
General Electric Co.
Schenectady, N. Y.



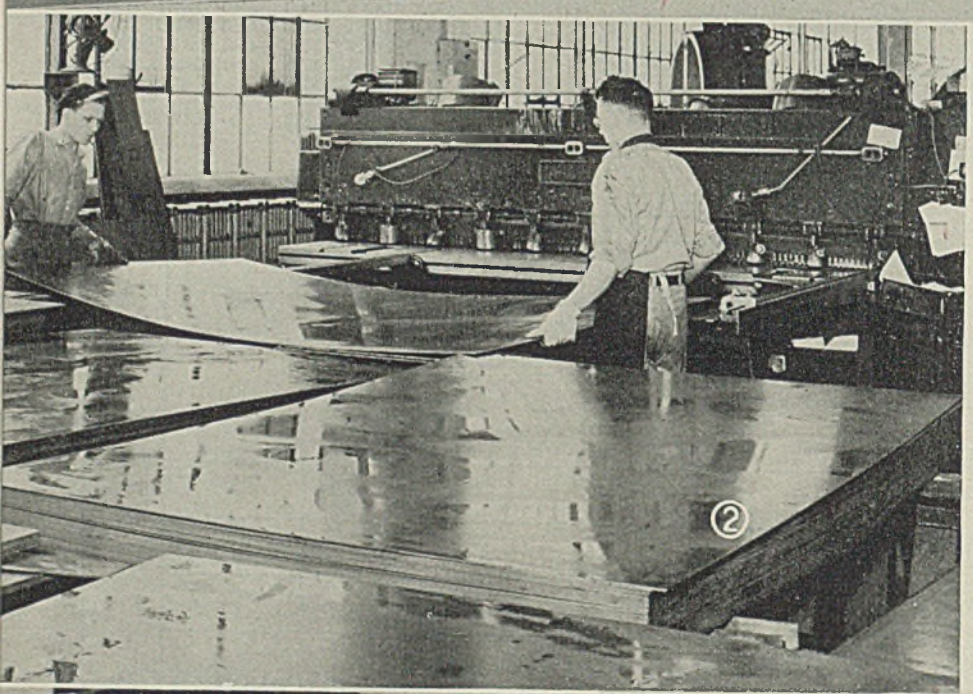
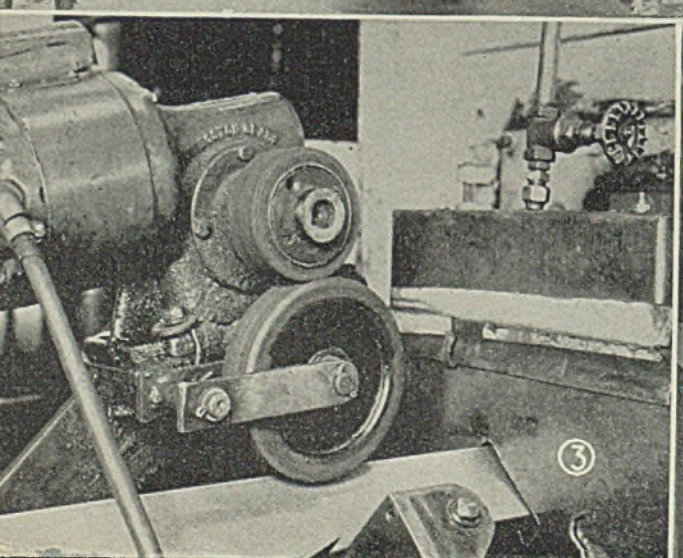
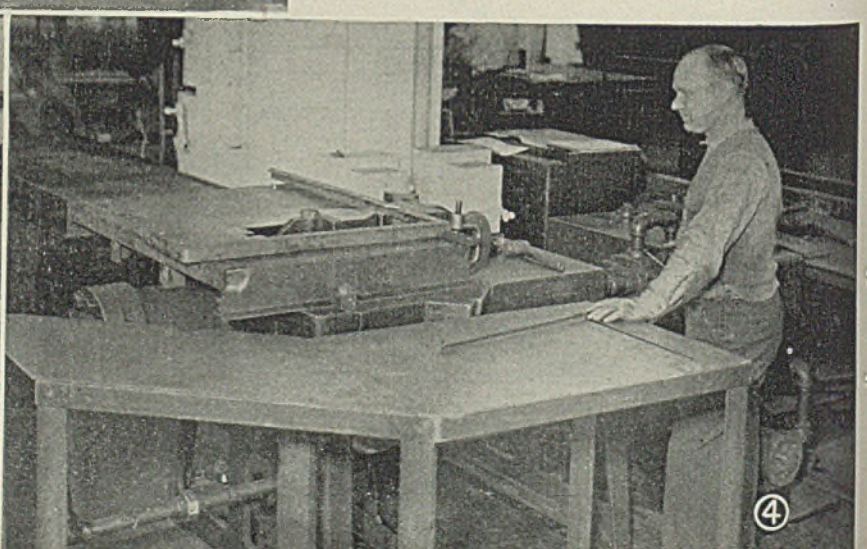


Fig. 1—Boxed portion shows copper connections needed for a typical unit of metal-clad switch-gear. These parts weigh 50 pounds. Contrast these with those shown in the lower portion—the copper required for a conventional open-type frame-mounted assembly—weight 220 pounds, almost 450 per cent of that required for metal-clad unit

Fig. 2—Sheet steel for panels, doors, plates, etc. is all of one special grade of hot-rolled sheet and is given one extra cold-rolled pass, followed by rust-preventative coating at mill

Fig. 3—Special machines like this remove rust and scale from structural members by passing them through grit-blasting chambers





in switchgear

. . . . saves 75 to 80 per cent of copper formerly required
. . . . makes possible standardization of parts to speed fabrication

PRESENT TYPES of steel switchgear, such as metal-clad gear cubicles and unit substations, lead to important savings in materials other than steel. Chief among these is copper. Such material savings are effected through the simple process of bringing together in compact units parts that are co-ordinated and especially designed for the equipment structures.

Production and installation time is saved because such steel switchgear is susceptible to quick production, rapid installation and immediate service when in place. Still other economies follow from the equipments design and operational advantages.

These gains definitely justify the use of steel in switchgear in the present emergency. Estimates indicate that if open-type construction were used in place of the 1942 General Electric production of metal-clad switchgear, it would require 725 more tons of copper, some 871,000 more conducting parts, and 411,300 more joints in electrical circuits. Fig. 1 illustrates graphically the important savings in copper that are typical.

Steel is the basic metal in G-E switchgear because of its great mechanical strength, its resistance to arc burning and because it lends itself more readily than other metals to bending, forming and machining operations. *Its use permits the standardization of switchgear parts upon which efficient utilization of material depends.*

In enclosed equipments, steel is used to form compartments for isolating one circuit from another and for isolating from each other different classes of equipment in the same circuit. Readily grounded, such steel compartments offer great resistance against the spread of faults in adjoining equipment. Almost exclusive use is made of steel in framework, equipment-covering and supporting plates, isolating barriers, gussets, reinforcing and stiffening members, device mountings and panels, except in a few cases where insulating materials are still employed. Stocks of parts for such switchgear compartments are easily standardized.

Let's follow a typical sequence of fab-

(*Please turn to Page* 91)

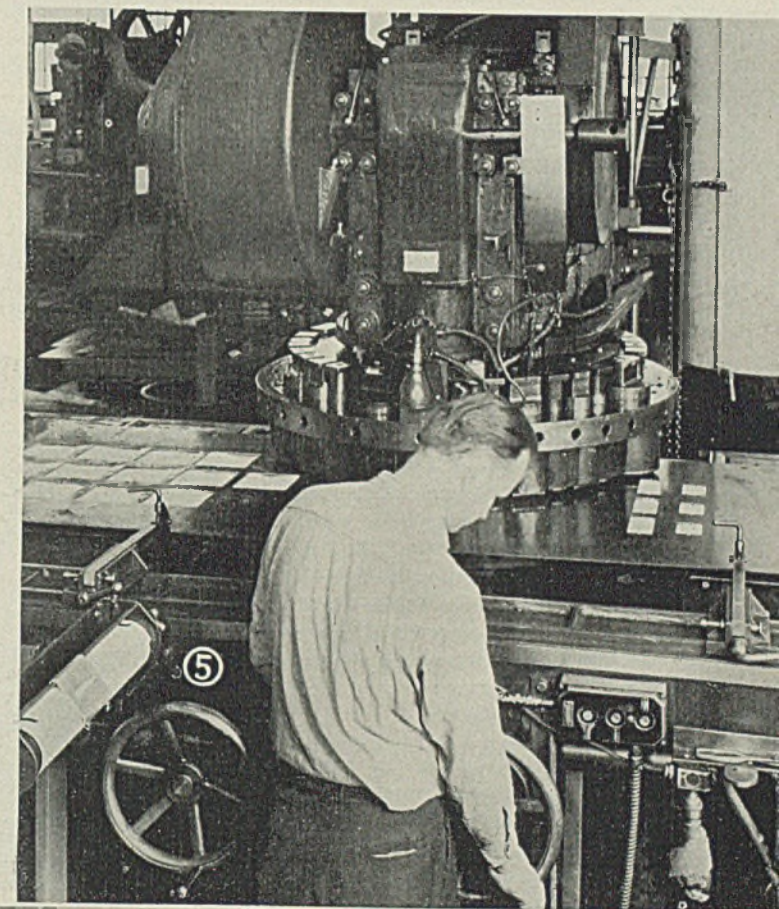
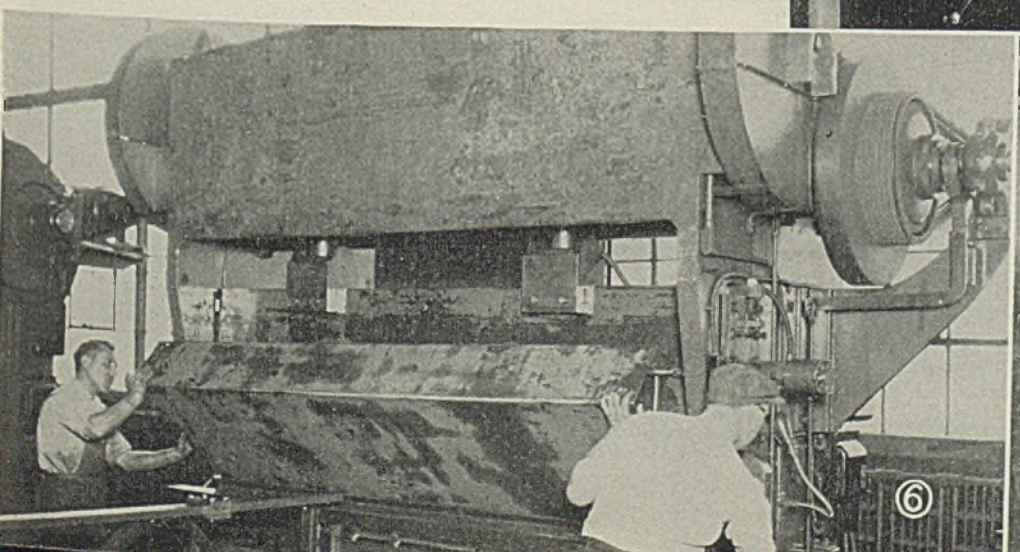


Fig. 4—Special hydraulic bending equipment forms corners in angle sections for frames

Fig. 5—Standardization enables this press with multiple dies to punch meter and control openings to exact size in one setup. Tabulation on roll left enables operator to choose correct die set and also gives horizontal and vertical spacing dimensions

Fig. 6—Sheet steel becomes switchgear housing. Bending in huge brakes like this is one of the important steps in fabricating sheet steel

Fig. 7—Pneumatic grinder unit being used to remove heat marks from spot welds on assembled "Cabinetrol" case in process of finishing



"Machinist Mates" . . . . make machine tools at Monarch

By WENDELL E. WHIPP
President
Monarch Machine Tool Co.
Sydney, O.

IN NORMAL TIMES the machine tool industry has used few women employes. In most plants the work has been considered more suitable to the physiques of men than women. So with a plentiful supply of men available, it is only recently that more than a passing thought was given to employing women operators.

Just as in Britain and Canada, this war and the resulting scarcity of men has brought many of us face to face with the necessity of employing women in our factories. Many of us still remember the part women employes played in American war production during World War I.

At Monarch we put off the actual employing of women just as long as we could. We didn't bring ourselves to do it until there were virtually no more employable men available. But for many months we thought about it and gathered as much information about it as we could so that as the time came nearer the bringing of women into our plant did not seem quite the revolutionary step it had always been considered.

We are all familiar with the large numbers of women successfully performing all classes of machine and assembly operations in the gun, ammunition, aircraft and machine tool plants in Britain and Canada.

Today women constitute at least one-fourth of the working force in our great aircraft industry. In many of these plants, future personnel plans call for the employment of more women than men. Women have long been working beside men without any distinction whatever as to occupation or as to rate of pay in these plants. So, in employing women in the machine tool industry, we were not venturing on an uncharted course. Now let me tell you frankly about our experience.

For a long time we had been thinking about employing women but had not done anything about it. Then on the first of March, 1942, we went to 3-shift 7-day operations. With that step, we realized that we had reached the practical limit of available manpower in our area.

Among those women making application for employment was one in particular who showed unusual promise. She was a mature woman with a background embracing considerable business and legal experience. It occurred to us that we might well take her on and use her as a laboratory experiment with the idea that if she proved out, she could then act in the capacity of "supervisor of women", or "dean of women", or whatever you might name that position, in case we later employed a large number of women in our plant.

So early in May this woman was placed in the production control department along with two others. During June and July we began to employ more women in production control and in stock checking. The men replaced by women were put on production jobs elsewhere in the factory to replace men entering the armed services and to fill other shortages.

In the meantime, this particular woman who we thought eventually might be the "supervisor of women" in our shop literally tried out one job after another throughout the plant. She went from department to department, working on a wide variety of machines. The purpose was to find out whether a woman could perform these operations. She was successful in performing almost all of them. As a result of this experience, we were convinced that women could successfully undertake almost any of the jobs in our plant.

From the first of August, women have been added to our factory force as rap-

From a paper presented at the forty-first annual convention of the National Machine Tool Builders' Association, Oct. 6, 1942, New York.

idly as they could possibly be absorbed. Out of a total factory force of 2600 on Oct. 6, some 300 are women. There are 95 women in the machine division on the day shift.

On the shift from 4 p. m. to midnight, there are 102 women. On the shift from midnight to 8 a. m. we have 103 women. These women are about equally divided between machine operation and assembly.

Generally speaking, the women in the older age brackets are assigned to the assembly division, the younger women being used in the machine division because of their capacity to learn the operations rapidly and their dexterity in handling machines.

On all three shifts the women operate all types of machines with the exception of planers, heavy turret chucking lathes and similar heavy work. Women have proved capable of handling all types of machining operations. Our only differentiation between men and women thus far has been entirely on the basis of degree of physical effort.

If our supply of available manpower should be even more seriously curtailed, we would not hesitate for a moment to assign women to the operation of the heavier classes of machines. Of course adequate work-lifting facilities will be provided to reduce the amount of physical effort involved.

As new employes, women have shown themselves just as capable of learning how to operate machines as new men. In fact, they have shown themselves superior to men in learning certain types of operations. Let me give you a few illustrations.

Women do particularly well in work requiring consistent care and alertness—in jobs where it is necessary to work to close tolerances involving the use of gages, micrometers and other checking equipment, jobs that call for little physical exertion.

Too, women excel in work requiring manual dexterity and speed in repetitive movements, especially in operations which permit the operator to set her own tempo and where she can work in sitting position.

At the same time we are not sure it makes any great difference whether a woman sits down or stands up at the job. Most of the women in our plant prefer to stand up at a job where they might just as well sit down on a stool.

A few days ago one of our foremen noticed a woman standing on a small, clean box while working at an assembly bench. He asked her why. She said, "These new shoes are tight and they hurt my feet, so I took them off. I'm standing on this box to keep my feet clean and not lose any time." The foreman immediately gave her plenty of nice clean corrugated paper to stand on until she could find a more comfortable pair of shoes.

That incident is evidence of the type of willingness to carry on that motivates so many of these women in our plant. They realize very well that in working in our plant they are helping to win the war. *They find a woman can help in this war just as well as a man, and they are determined to do their part just as well as a man could do it.*

Now, to go back once more to the point mentioned previously—that women are entirely capable of handling larger and heavier machines if adequate work-handling facilities are provided—consider this illustration:

The other day one of our superintendents noticed a woman on an assembly job where it was necessary for her to lift a weight getting close to the 25-pound limit prescribed by Ohio law. He asked the foreman to change her to a lighter assembly job. The woman said:

"I'll work any place you put me, but I don't want you to get the idea that this job is too heavy for a woman. I'm no panty waist."

This instance is cited simply to show that as far as we can see the women expect no discrimination or any special consideration because of their sex.

And that, of course, is one of the reasons why the following wage policy with respect to women has been adopted in our plant. Starting rate for women is 5 cents less per hour than the starting rate for men. But an automatic 5-cent hourly rate increase at the expiration of a 30-day probationary period wipes out this difference.

Women employes who have been through the 6-week training course in the vocational department of our local schools start at the same wage as men. Women going through our own vestibule training school go into our plant on the same pay basis as the men in these classes.

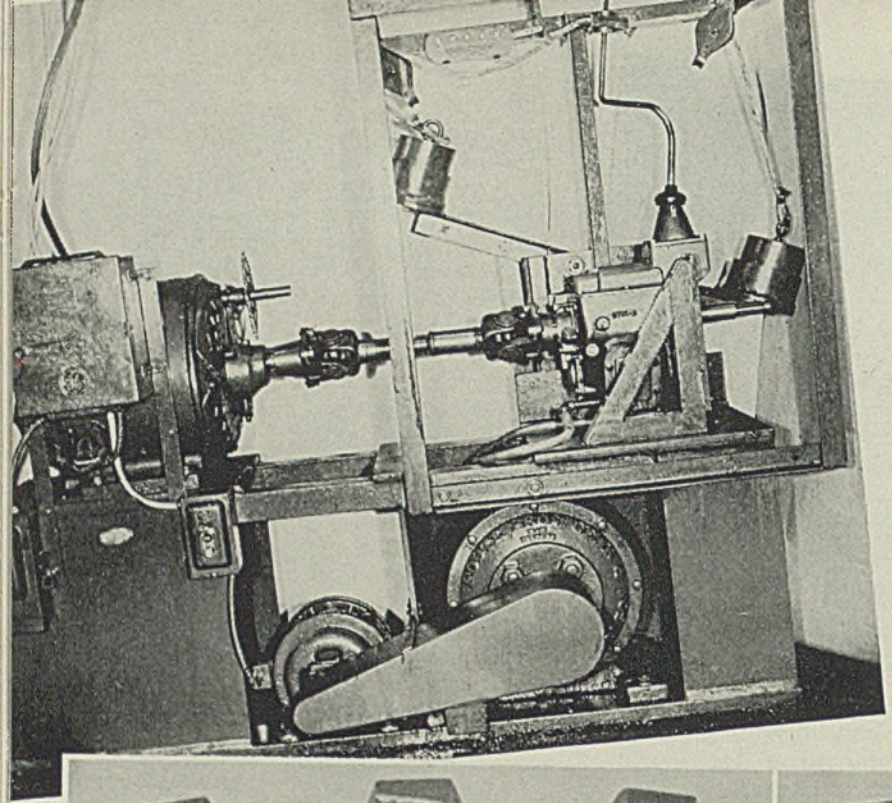
In short, while it is necessary for psychological reasons to start women at a rate slightly lower than men under some circumstances—we operate on the principle that women are entitled to equal pay for equal work done. *We are convinced this is the only fair basis of compensation.*

The actual mechanics of putting women to work involves placing the new girls in pairs to work side by side in the same department. The supervisor of women introduces the girls to the foreman of the department and paves the way for their acceptance in that department.

The girls feel free to talk to the supervisor of women on any personal matters having to do with the feminine side of the picture. But they work under the foreman, for the foreman is the boss.

The question of work costume has bothered many companies employing women. This caused no difficulty whatever at Monarch. The girls adopted slacks, a sleeveless shirt, bandana handkerchief and the machinist's apron more or less as a standard costume. There

(*Please turn to Page* 91)

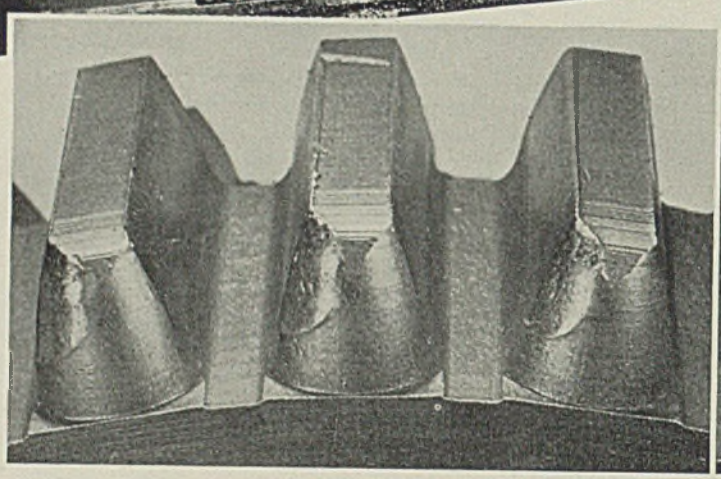


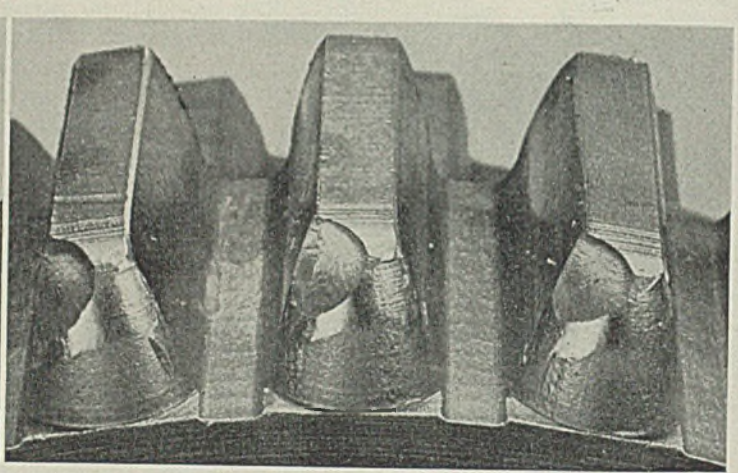
User Report No. 7

on Experience with . . . .

NE (National Emergency)

By S. L. WIDRIG
Chief Metallurgist
Spicer Mfg. Co.
Toledo, O.

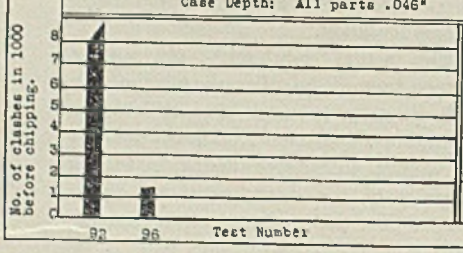




Steel NE 8124

HEAT TREATMENT: Carburized 1700° F. short cycle; cool in pot; Reheat 1550° F. in atmosphere furnace; quench in oil.
Tests #92, 96 were tempered at 400° F. for 1hr.

HARDNESS: Tests #92, 96
Gears: Case - 59 Core - 48
Shafts: " " " 39
File: All parts have slight trouch.
Case Depth: All parts .046"



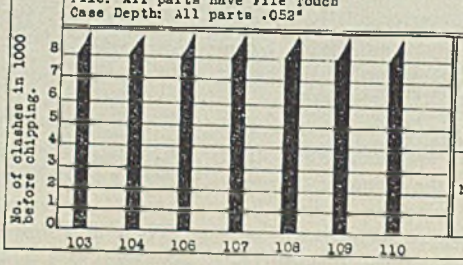
Actual Analysis: Sliding Gear:		Gears on Co-Shaft	
C.	.30	C.	.20
Mn.	1.44	Mn.	.55
Ni.	.0	P.	.015
Cr.	.19	S.	.015
Mo.	.26	Si.	.25
S.	.039	Ni.	1.75
		Cr.	.60

Note: Shafts of sets #92,96 are 4620-3 steel.

Steel NE 8620

HEAT TREATMENT: Carburized 1700° F. short cycle; cool in pot; Reheat 1525° F. in atmosphere furnace; Quench in oil.
Test #103, 104, 106, 107, 108, 109, 110 were tempered at 425° F. 1hr.

HARDNESS: Tests #103, 104, 106, 107, 108, 109, 110
Gears: Case - 60 Core - 29
Shafts: " " " 32
File: All parts have File Touch
Case Depth: All parts .052"



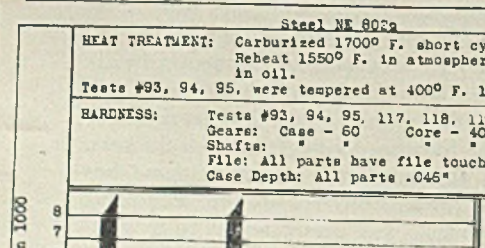
Actual Analysis: Sliding Gear		Gears on Co-Shaft	
C.	.20	C.	.19
Mn.	.77	Mn.	.75
Ni.	.48	Ni.	.55
Cr.	.69	Cr.	.77
Mo.	.22	Mo.	.22

Note: Shafts of all sets are NE 8720 steel.

Steel NE 8620

HEAT TREATMENT: Carburized 1700° F. short cycle; cool in pot; Reheat 1550° F. in atmosphere furnace; quench in oil.
Tests #93, 94, 95, were tempered at 400° F. 1hr. also 117,118,119,120

HARDNESS: Tests #93, 94, 95, 117, 118, 119, 120
Gears: Case - 60 Core - 40
Shafts: " " " "
File: All parts have file touch.
Case Depth: All parts .046"



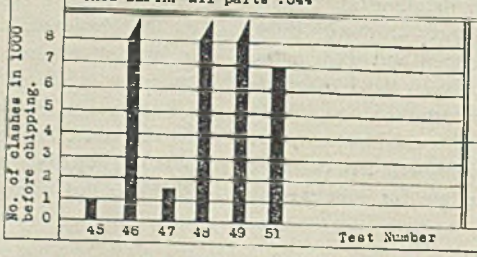
Actual Analysis: Sliding Gear:		Gears on Co-Shaft	
C.	.30	C.	.20
Mn.	1.44	Mn.	.55
Ni.	.0	P.	.015
Cr.	.19	S.	.015
Mo.	.26	Si.	.25
S.	.039	Ni.	1.75
		Cr.	.60

Note: Shafts of sets #93, 94, 95 are 4620-3 steel.

Steel A 4027

HEAT TREATMENT: Carburize 1700°F.; Cool in pot; Reheat 1550°F. in Atmosphere furnace; Quench in oil.
Tests # 45, 46, 47, 48, 49, 51 were tempered at 400°F. for 1 hr.

HARDNESS: Tests # 45, 46, 47, 48, 49, 51
Gears: Case- 61 Core- 43
Shafts ; " " " 30
File: All parts have file touch.
CASE DEPTH: All parts .044



Actual Analysis: Sliding Gear:		Gears on Co-Shaft	
C.	- .29	C.	- .24
Mn.	- .70	Mn.	- .84
Mo.	- .25	Mo.	- .23
Ni.	- .0	Ni.	- .0
Cr.	- .16	Cr.	- .0
Grain Size 5-7			

Note: Shafts of sets 45,46, 48 are Amola 4032, Core hardness at P.L. 43.
C. 36 Mn. 69 Mo. 21
Ni. 24 Cr. 0

For information on development of NE steels and their properties, see STEEL. Feb. 9, 1942, p. 70; March 16, p. 72; June 8, p. 66; June 15, p. 66; July 13, p. 80; July 20, p. 86; Aug. 3, p. 70; Aug. 17, p. 40; Aug. 31, p. 41; Sept. 7, p. 78; Oct. 19, p. 66; Nov. 9, p. 96; Dec. 28, p. 27.

For latest revised list of NE steels, see STEEL, Nov. 23, p. 96.

For reports from users of NE steels, see Nov. 16, p. 106; Nov. 23, p. 90; Nov. 30, p. 62; Dec. 7, p. 112; Dec. 14, p. 99; Dec. 21, p. 70.

ALLOY STEELS

. . . . as successfully employed in gears for heavy duty automotive transmissions

WHEN NE steels were first announced, we, as did other industrial users, realized the necessity of conserving vital materials being used in the SAE alloys. We also realized the small amount of time allowable for experimentation before our own war products had to be rolling off our lines. As patriotic citizens we wanted to use these new NE steels to their fullest adaptability. However, we also were fully aware that our reputation would be staked on the satisfactory performance of our product—no matter what materials were used or what circumstances forced their choice.

As soon as NE steels were obtainable, checking was started. At the time, the only actual tests that had been made by anyone were Jominy hardenability tests, which data had been broadcast. Realizing fully the value of such testing, we were nevertheless aware that this did not tell the entire story about the desirable characteristics of good steel for gear stock.

One of the most important products of our Toledo plant is heavy-duty transmissions. While hardenability is of great importance among the characteristics of the steel used for this work, generally speaking, heavy-duty gears must primarily possess toughness and ductility as well as resistance to fatigue. So important had this been that our 4620-1 and 4620-3 steel (1 indicating electric steel and 3 open hearth) were developed some years ago in the Spicer laboratory to meet our own needs. After popular acceptance by the trade, our formulas were adopted and given the SAE series number of 4320. With this experience as a background, we carried our checking of the NE steels along lines similar to those employed in developing the standard steels mentioned above.

It would no doubt be appropriate at this point to explain briefly the development of our tests for resistance to impact of the tooth points during the gear shifting operation. Knowing that most service failures in transmissions occur as a result of the shifting operation because of haphazard declutching by the run-of-the-mine operator and remembering that quietness and smooth operation were demanded of heavy-duty transmissions as well as certain other physical characteristics, we had to develop testing apparatus that would duplicate the actual service conditions demanded in the field as nearly as possible.

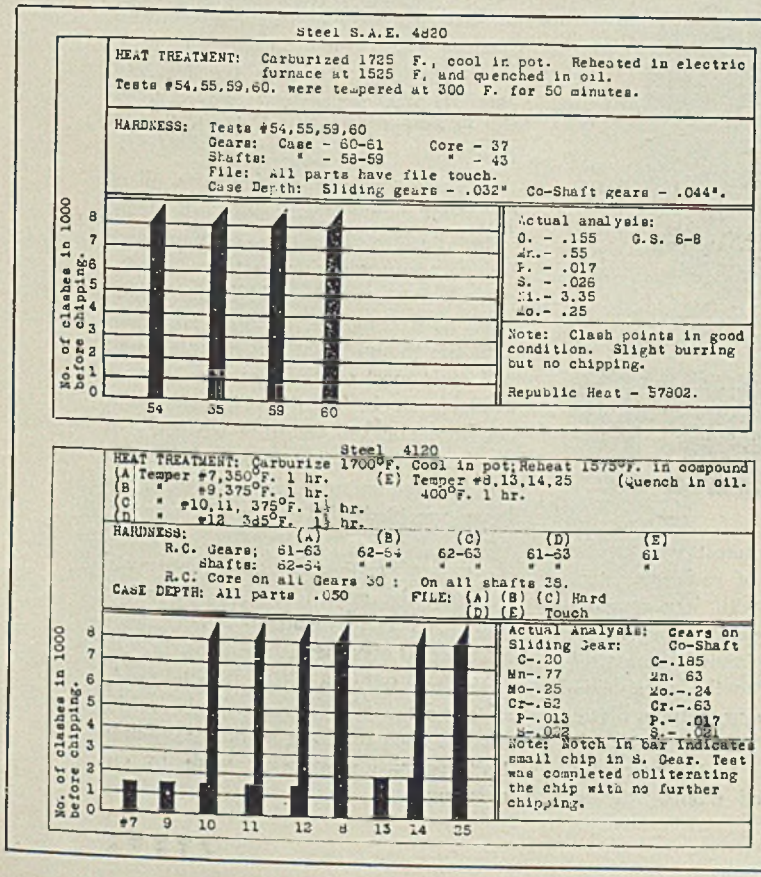
As a first step, a truck and trailer com-

Fig. 1. (Upper left, opposite page)—Special setup for automatically applying uniform clash test to automotive transmission gears

Fig. 2. (Lower left)—Shows tooth points of a gear after 8000 clashes in the test machine in Fig. 1. Although slightly battered, teeth are not chipped and gear is considered to have rendered satisfactory performance

Fig. 3. (Immediate left)—Here tooth points have chipped considerably at 3000 clashes. This gear is definitely unsatisfactory

Fig. 4—These charts, both pages, show result of the Spicer clash test on various standard and NE steels



bination were purchased. With trailer loaded to the rated truck capacity, the outfit was put through a series of hard tests.

Truck drivers were instructed to put the gears through the worst possible punishment in the shifting operation. A standard test was set up and gears of various steels were tested. This was followed by varying the heat treatment given these steels and noting the effects upon the gear life before chipping and wearing of the teeth occurred. Definite improvement was noted to accompanying certain heat-treat methods of control.

At the same time these clash tests were being carried on with the truck, a laboratory testing machine was being evolved that would not only give consistent data on chipping but would reproduce as closely as possible the actual conditions involved in service as was being shown by the truck tests. This machine consists of a transmission rigidly attached to a test jack as shown in the accompanying illustration, Fig. 1, with the main shaft operated by a variable-speed motor and the gear-shift lever pulled in and out of mesh by a rocker arm weighted at each end and driven separately by a second motor to produce approximately 19 shifts per minute. In this setup, the gears were severely clashed as each shift was made. A counter attached to the gear-shift lever recorded the total number of shifts made in the test.

One of the reasons for the development of this machine was that ordinary laboratory impact tests such as Izod and Charpy gave no indication whatever of the actual resistance to impact imposed by shifting gears as shown by the truck tests.

With this testing device all set up and its reliability well established through several years of use, it was only natural to carry the NE steels through the same testing procedure. It gave a comparative study of those new steels as against the old and has been of great value in pointing the way toward possible new uses of these alternates as well as a quick means of detecting any changes necessary in heat treatment procedure to produce desired characteristics in the metal. In general, the opportunity to complete as much testing as desirable has been limited, but we have been able to supplement our own findings as a result of close co-operation with other companies who have been able to devote more time to dynamometer fatigue testing of NE-8600 and NE-8700 steels, which are comparable to the other older accepted series.

In our own application in heavy-duty transmissions, we have found the best hardness range for gears to be between 59 and 62 rockwell and tempered to a point where they can be touched with a testing file. This latter condition determines the tempering temperatures for the various steels used.

As to shafts and parts of that nature where gear teeth are not involved, we have determined that Jominy end-quench hardenability tests are sufficient for the proper selection of steels.

Steel Harder to Treat

In general it can be said that steels in this NE series are more difficult to treat. The temperature control must be much closer to produce characteristics desired in the metal. Many NE steels of these types have more rapid transformations, thus must be more closely controlled during heat treatment. It is also important to note that most carburized gears are hardened on dies, fixtures, or plugs, and since different types of steel distort differently on heat treatment for which adjustments must be made on the dies, fixtures and plugs, it must be borne in mind that the various NE steels also require adjustments of the dies and fixtures in order to control distortion and turn out the kind of product desired.

Our tests have shown that some of these NE steels are not entirely satisfactory for heavy-duty gears. We have found, however, that those steels can be used on other parts such as shift rails, spacers, etc., which do not require so much ductility. To date the NE-8600 and NE-8700 series have proved to be the most satisfactory of the NE steels tried.

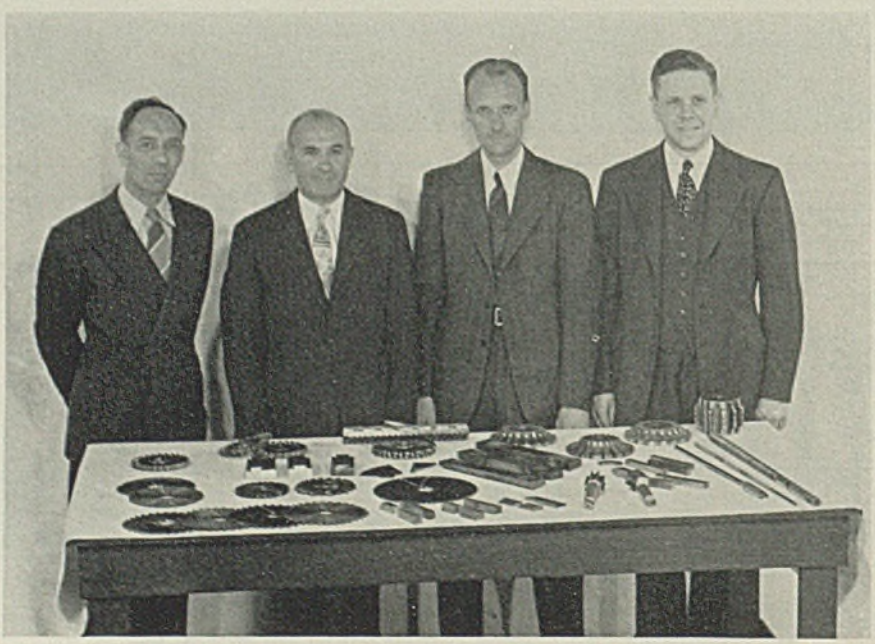
With few exceptions, however, all of our gears now use alternate NE steels.

In checking over the accompanying test data you will note that we have included data on four SAE carburizing steels as well as four alternate NE steels with the thought that the range covered will meet most of the queries on current available steels. The NE-9400 series has not been checked yet since we have not yet been able to obtain samples. From the information available, however, we have specified this material in many cases.

As our testing proceeds, we will undoubtedly substitute this series for other NE types wherein higher alloy content has been used.

We are fully confident that in nearly all cases the NE alternate steels can be used in such products as the heavy-duty transmissioins now being made by our company.

TOOL RECLAMATION EXPERTS DO REAL JOB



THESE men furnished Herbert E. Fleming the information on tool reclamation at International Harvester that appeared in STEEL, Dec. 7, p. 122 and Dec. 14, p. 88: Left to right—G. H. Schroeder, foreman, tool reclaiming department; J. W. Phillips, superintendent, Tractor Works; W. L. Parazin, assistant superintendent; W. A. Johnson, tool and research engineer, also in charge of burden control. Much interest was created by the excellent job of reclaiming tools for war production with low temperature brazing at this plant. Early in this work, typical tools reclaimed successfully were displayed and methods explained at conferences of representatives from all Harvester plants, thus extending this valuable "know how" to the company's many widely scattered plants.

How to get Tools that step up production

When the problem of selecting the steel for a new tool comes up—when the heat treating procedure for best results must be decided upon—that's where "The Carpenter Matched Tool Steel Manual" can help you in many ways to get the kind of tools that give *plus* production. Because it is so handy to use, so packed with information, so *practical,* it is the "bible" of many tool engineers—used over and over to help solve problems of tool steel selection and use.

How to choose the Right Steel for Each Tool

For instance, picking the recommended steel for every type of tool is simplified with the 80-page Tool Steel Selector Section that is included in the Manual. Just flip the pages and it quickly indicates the one to use—and tells you *why.*

How to Heat Treat it properly

Another section of the Manual gives complete and accurate heat treating instructions for each of the Carpenter Matched Tool Steels—in a concise and readily usable form that your tool room will appreciate. It eliminates guesswork, helps you get tools that can step up production. Use this worthwhile information to help your all-out war effort.

How to Quickly Identify Tool Steels

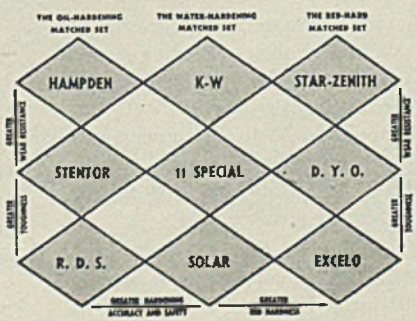
For quickly checking the identity of the tool steel before heat treating tools—for identifying mixed stock and segregating scrap—here is a wall chart (21" x 30") that can help you train your men in spark testing. It clearly identifies the spark of each of the Carpenter Matched Tool Steels—and provides information on spark characteristics caused by the major alloys.

We will be glad to send you the "Carpenter Matched Tool Steel Manual" and the "Guide for Spark Testing Tool Steels" free. Simply write us on your company letterhead.

The Carpenter Steel Company, 139 Bern Street, Reading, Pa.

Carpenter MATCHED TOOL STEELS

IMPORTANT BEFORE... VITAL NOW



COPPER DEPLATING

. . . . by new method recovers practically all material in usable form, is accurately controlled and works fast

A NEW METHOD for recovering copper by deplating it from iron and steel scrap has been developed by the Electroplating Division of E. I. du Pont De Nemours & Co., Wilmington, Del. The operation permits approximately 100 per cent recovery of anode copper—an important war material. Hitherto, the removal of copper plate used as a stop-off in localized hardening and other purposes was not only costly, but most of the copper was wasted.

The advantages claimed for this new method are:

1—Practically 100 per cent of the deplated material is recovered in a form satisfactory for direct re-use as anode material.

2—Deplating is carried out under controlled operating conditions.

3—Deplating can be done very rapidly; up to 0.001-inch of copper can be removed in 9 to 10 minutes using current densities up to 60 amperes per square foot.

4—Deplating takes place without attack of the base metal—in decided contrast to usual stripping methods.

Unlined steel tanks, equipped with steam coil, conventional work rods and means for agitation, comprise the recovery equipment. Work agitation or solution circulation may be used. Solution circulation is preferred for it gives a certain amount of circulation effect on the cathodes, thereby permitting the use of higher cathode current densities without loss of efficiency. The solution is:

CuCN	3.5 oz./gal.
NaCN	5 oz./gal.
NaCN (free)	1 oz./gal.
Na_2CO_3 or K_2CO_3	3 oz./gal.
pH	12 electrometric
	12.5 colorimetric

In operating, the temperature should be 175 degrees Fahr.; potential across tank bus bars should be 2 volts; the anode current density on work to be stripped should be 35 to 40 amperes per square foot; the cathode current density should be 5 to 15 amperes per square foot or as low as possible.

Experience shows that at anode current density of 35 amperes per square foot 0.001-inch of copper is deplated in 15.1 minutes. A potential of approximately 1.8 volts is required; higher voltages permit too much current to flow from the steel areas of stripped parts, thereby giving unbalanced electrode efficiencies.

The solution should be completely circulated from two and a half to three times per hour, using all-iron or steel pumps. It should be pumped through pipes placed in the tank bottom directly under the work. The number and size of holes in the solution circulation pipes are governed by the tank depth and other factors, but generally these holes should be ⅛ to ⅜-inch in diameter and located 12 to 24 inches apart. As a general rule, the total area of the orifices should be approximately 75 per cent of the area of the discharge side of the circulating pump.

If mechanical agitation is used, agitation should be at the rate of 10 to 15 feet per minute.

Cleaning prior to deplating must be thorough—otherwise the reclaimed copper may not be suitable for use as anode material. A satisfactory cycle follows:

—Anodic electrolytic cleaner 2 to 2.5 minutes

—Rinse (optional) 30 seconds

—Anodic electrolytic cleaner 2 to 2.5 minutes

—Rinse 30 seconds in cold water

—Rinse 30 seconds in second cold water tank

—Acid dip 1 to 2 minutes

—Rinse 30 seconds in cold water

—Rinse 30 seconds in second cold water tank

—Deplate—time as necessary at 35 amperes per square foot based on 528 ampere-minutes to remove 0.001-inch copper

For replating, the above cycle may be continued as follows:

—Rinse 30 seconds in cold water

—Rinse 30 seconds in second cold water tank

—Copper strike 45 seconds

—Copper plate time as necessary

—Dragout recovery rinse 30 seconds

—Rinse 30 seconds in cold water

—Rinse 30 seconds in hot water for drying

If the racks are to be used for deplating only, they should be made of plain steel. If the racks are to be used for plating as well as deplating, they should be made of copper stock and rubber insulated.

For a control of recovery the following three rules should be followed:

—The free cyanide must be controlled analytically by the regular silver nitrate titration method. The free cyanide should be held at 0.75 to 1.25 ounces per gallon.

—pH control is necessary and should be determined by the use of an electrometric pH meter. For optimum results the pH range is 10.9 to 12.1 electrometric or 11.4 to 12.6 colorimetric.

—The solution should be operated at 175 degrees Fahr. This temperature should be controlled automatically.

Standard on Steel Spirals Reaffirmed

Simplified practice recommendation R53-32, "Steel Reinforcing Spirals", reviewed recently by the sponsoring organization, the Concrete Reinforcing Steel Institute, was reaffirmed without change according to the Division of Simplified Practice, National Bureau of Standards, Washington.

The recommendation was established in 1927, reaffirmed in 1930, and revised in 1932. This issue was reaffirmed once before in 1938.

The simplified list of four sizes of steel spiral rods, representing a variety reduction of about 43 per cent, are the sizes permitted by Schedule 1 of Limitation Order 211, issued by the War Production Board.

Masking Material "Peels" in One Sheet

A new waterproof, protective and abrasion-resistant mask which can be sprayed on surfaces to be protected and later "peeled" off is announced by Adhere Inc., Los Angeles. Called "spray-mask", it is applied with an ordinary paint spray gun.

Although primarily used by aircraft plants on the plastic glass bomber noses and windshields, the mask is reported to have qualities suitable for use in other types of production—as a temporary protective coating against paint, grease, abrasion, wind or weather.

The film formed is tough enough to prevent abrasions and ordinary scratches during the assembly process as well as being resistant to paint for masking purposes. It is waterproof; has no chemical action on the plastic and is impervious to paint thinners and ordinary solvents. When dry it not only peels off neatly in a sheet, but actually tends to clean the surface, it is said.

Good tools occupy a key position in the manufacturing program of today. They can be properly designed only when the production processes and gaging operations are fully considered. Dimensional control is always an important function of the tool designer and should be an integral part of the design problem.

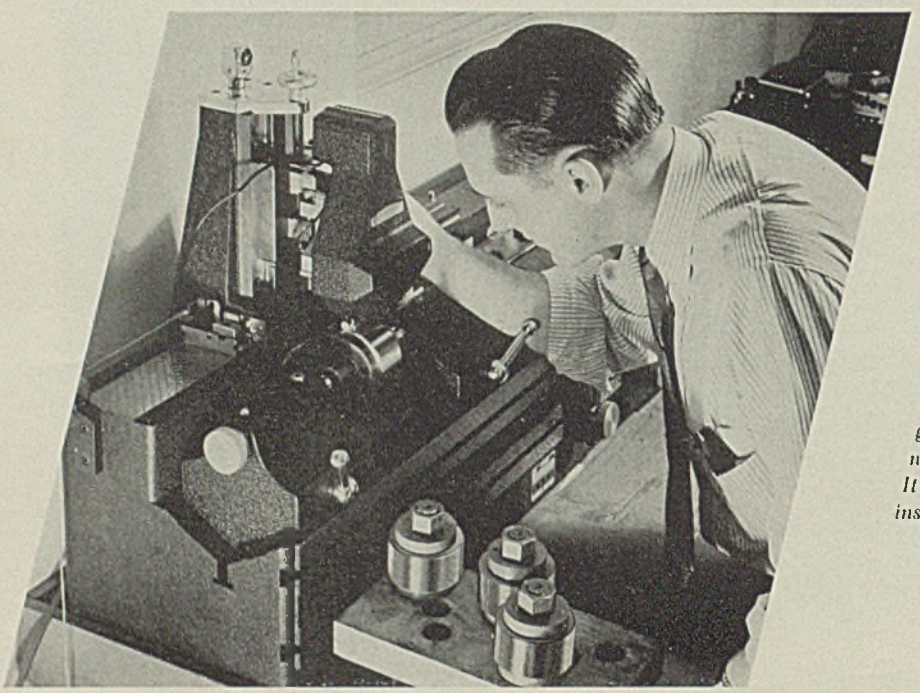
The Contract Work Division of Sheffield is composed of engineers who have had the broadest of experience in a very wide range of industries. They also have the advantage of a very close association with the manufacturer of gages and a true appreciation of gaging practice. When Sheffield engineers undertake a tooling program, they are prepared to carry it right from the first preliminary sketch through to final working drawings. The most economical sequence of manufacturing processes, handling, and gaging operations is stipulated.

SHEFFIELD GAGES
MASTER GAGEMAKERS

THE SHEFFIELD CORPORATION
DAYTON, OHIO, U. S. A.

If You Are TOOLING-UP for Some New Product, SHEFFIELD ENGINEERS Can Save You Much Valuable Time
☆

STANDARDIZATION IN BRITAIN



By DENYS VAL BAKER
London, England

Standardization means use of precision measuring instruments such as this lead checking instrument employed to check the leads of thread gages seen in the foreground. This is a comparatively new development in instruments. It is shown here being used in final inspection as Suprex Gage Co., Ferndale, Mich.

STANDARDIZATION in Britain is now regarded as a national problem, affecting all industries. Obviously it is not a problem that can be solved haphazardly. Experience shows, too, that it is not one that can be solved by industry alone, nor by the government alone. Representatives of industries find it difficult to approach the problem unbiased by certain obvious commercial considerations —on the other hand, government departments, while able to view the problem more clearly from the point of view of the national effort, may not properly understand the importance of the manufacturers' viewpoint. The obvious solution is for control to be vested in an independent organization on which both industry and government are represented, together with representatives of certain other viewpoints (i.e. retailers and consumers) in the case of goods for sale to the public—or professional designers in the case of engineering and other heavy production. Over here, then, we have tackled standardization through the British Standards Institution.

The BSI, as it is commonly known, is an entirely independent body which was formed many years ago, in peacetime—at first, to assist production in our great engineering industries which has expanded to an enormous extent, both in scope and importance, since the outbreak of war. Naturally, it is a nonprofit making concern. Its finances are provided by liberal grants from various industries, together with a grant-in-aid from the government, contributions from the governments of dominions, from professional institutions, and also from a number of municipal and other local authorities.

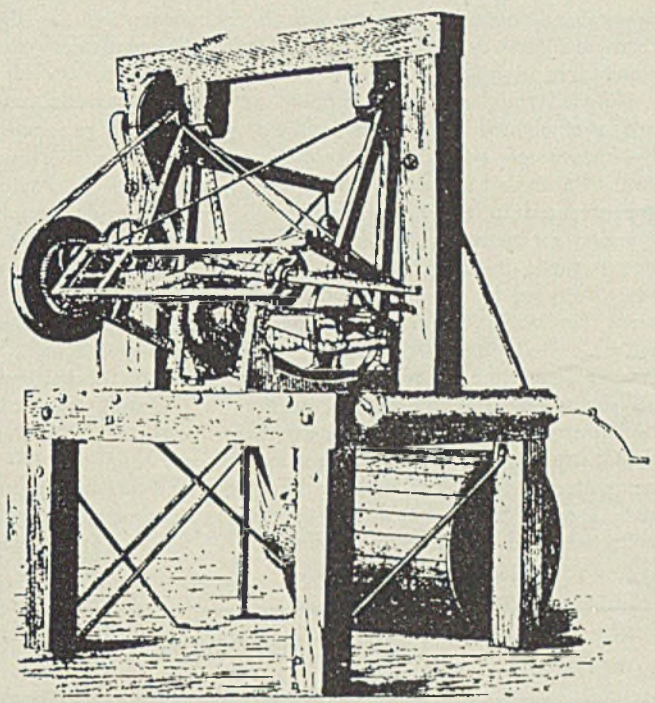
The present annual expenditure is in the region of £40,000 ($160,000) a year, and towards this the government grant-in-aid is about £7,000 ($28,000). It is also estimated that in addition to the direct contributions from industry, the voluntary services and help rendered by various manufacturers and trade organizations amounts to not less than £50,000 ($200,000) annually. Even so it will be realized, in view of the volume and importance of the work, that it is something of a miracle that its cost should be so trivial. (pound sterling equals $4.00 as of August 1942).

Despite its financial dependence, the institution remains completely free from any outside control. Its work is made available to the whole of industry, and a membership scheme exists to enable those who wish to be kept fully informed of all developments and of any new standards which are issued from time to time. For the purposes of organization the essential industries of our country are grouped into broad sections—viz. engineering, building, chemical, textile and distributive. Divisional councils exist to represent each of these sections and they are responsible for the standardization carried out in each. Each council includes representatives from all the government departments interested in the particular section of industry (i.e. usually Ministry of Supply and Board of Trade, perhaps Ministry of Food), the Department of Scientific and Industrial Research and the National Physical Laboratory, and representatives from industry itself, including the professional research and manufacturing and retailing branches.

The general policy of the institution as a whole is directed by a general council which is constituted by nine repre-

A Curious Machine

has lately been advertised that will churn, scrape Potatoes, rock the cradle and Darn Stockings



THIS bit of early-American humor, which appeared in a New England newspaper more than a century ago, may well have been inspired by the "curious machine" shown here. It marks the beginning of a public awareness of the mechanical wonders ahead . . . Back in the days when "Industry" was spelled with an I, it was the birth notice of the Machine Age in America.

Picture the times when that notice appeared: Witchcraft was still a subject for serious dispute, and sane men believed that insanity was caused by Devils. Cocked hats and big-buckled shoes were still to be seen, and sober men declared the steam engine a passing idea, over their tankards of flip in the taverns. . . . The hammer and anvil were the symbol of the times, and every part of every musket or cannon or clock was made individually, by hand.

That was the setting. And in the midst of it, some of the greatest inventive geniuses the world has ever known were quietly changing the shape of things and of thought with the "curious machines" they were inventing. Such curious machines as the one shown here. Machine *tools*, with which each part could be made in quantity, and precisely alike. . . . Tools that were to make machines that would churn, scrape potatoes, rock the cradles of industry, and even darn stockings!

★ ★ ★ ★

BUT they were doing more of importance than inventing curious machines. Those men of mechanical genius were founding a handful of machine tool companies that have literally made possible all the rest of industry.

One of those companies — Jones & Lamson — is here today, a direct descendant of the first great machine tool builders in America. With a heritage of skills, knowledge and equipment that has constantly grown, from the very birth of our industrial age, Jones & Lamson engineers and service men are particularly qualified to serve any phase of industry today and during the difficult period of post-war readjustment ahead.

Jones & Lamson service is at *your* service now!

JONES & LAMSON
MACHINE COMPANY
SPRINGFIELD, VERMONT, U. S. A.

Manufacturers of Ram & Saddle Type Universal Turret Lathes . . . Fay Automatic Lathes . . . Automatic Thread Grinding Machines . . . Comparators . . . Automatic Opening Threading Dies and Chasers.

Profit-Producing Machine Tools

sentatives elected annually from each of the divisional councils, together with nominations from government departments, the D. S. I. R., the N. P. L. and the founder institutions. More recently, however, arising from the rapid expansion of the work since the outbreak of war, an executive committee has been set up, including chairmen of the general council and divisional councils and other representatives. Some idea of the vast scope of the institution as it now exists can be obtained from the fact that there are now more than 1000 of its committees in existence.

National standards, when agreed on, are promulgated throughout industry by means of publications known as British Standard Specifications. They are prepared in the following way: A proposal for some piece of standardization is made by a recognized authority in industry or by a government department (in wartime it is invariably the latter). It is firstly considered by a special committee of representatives of all sections of the industry, or section of industry concerned. If the committee decides to go ahead, they next set up a committee of technical experts. Up-to-date knowledge on the subject is thus collected, and by pooling information and experience it is possible to thrash out the details of a draft specification.

This recommended standardization is circulated in draft form throughout the industry for comments and criticisms. After these have been taken into regard, a final publication is prepared.

In peacetime these specifications were more voluntary than compulsory, but today they are compulsory. Indeed, the usual procedure is for the BSI to work in very close conjunction with departments such as the Ministry of Supply (in particular) so that, when the Ministry has decided that supplies of such a raw material must be cut or abolished, the BSI gets out new specifications for industries concerned in the use of the material—packaging and packing is a very good example—in which they attempt to suggest new standardizations which will involve less use of the restricted material. These are now usually issued at the same time as the Ministry of Supply's order banning or restricting use of the particular material.

During the past year more than 100 new and revised specifications were issued by our BSI—compared with two or three a year in peacetime. The total number of current standardization specifications in the general series is now nearing 1000. Of these, some 3,300,000 copies have already been distributed through industry. Moreover, in addition to the general series there is a separate series of some 166 specifications for aircraft materials and component parts which are issued under a special arrangement with the Ministry of Aircraft Production. Similarly, a further special series of specifications has been issued in connection with the Ministry of Home Security, laying down standardized sizes for various A. R. P. products.

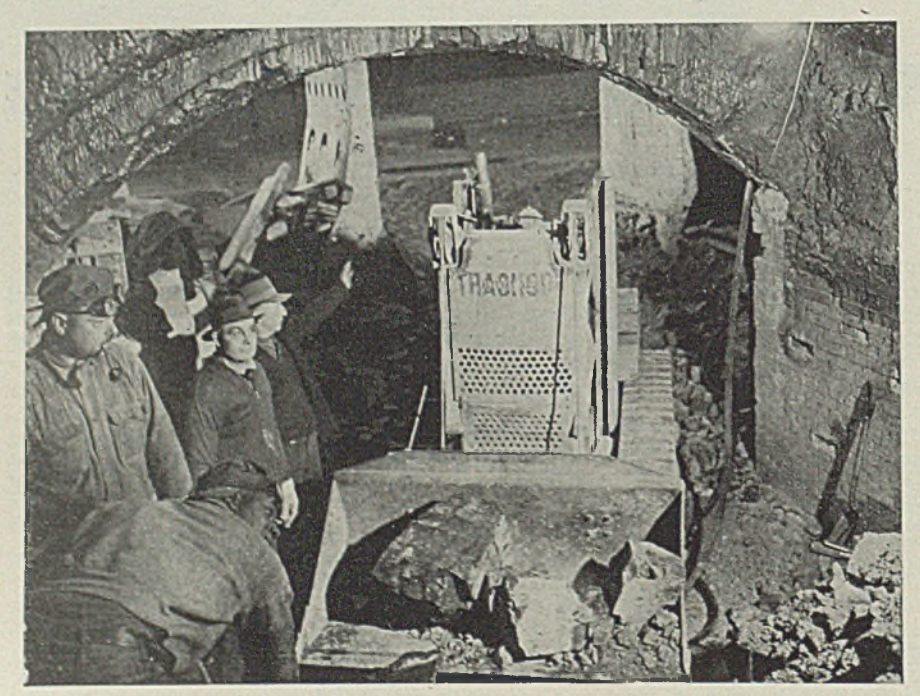
Standards specified are so far as is possible defined in terms of "performance." As little as possible is specified as to how the material or equipment should be made, allowing the manufacturer a free hand to use his ingenuity and discretion. Nor does the issue of a standard imply finality; the committees meet periodically to review their specifications in the view of latest developments.

The scope of the work of the BSI, in wartime, is directed almost entirely to the subject of war emergency standardization —standards intended to apply for the duration of the war only, and automatically due for revision when peace comes. This work can be classed as follows: (1) modifications necessary to existing standards due to restrictions in supply resulting from war conditions; (2) preparation of new standards for materials which are being used for war purposes; (3) standards for commodities, components and articles, the preparation of which is undertaken for such purposes as securing economy in the use of material, interchangeability of parts or of facilitating mass production. Here are one or two examples which will give an excellent idea of how that work is put into practice: **Tin:** Schedules of standard sizes of tins and cans for food and other products were prepared by a committee representing the tin manufacturers, the food (and other goods) manufacturers, the retailers and the government departments concerned. Unnecessarily wasteful sizes were eliminated—instead of six different sizes perhaps two (small and large) were decided on—and the proportions for those sizes permitted were laid down so that they would be most economical in the use of tin plate. The economies thus effected are estimated to be in the region of 40,000 tons of tin plate annually. Some idea of the vast work involved in securing this result will be gathered from the fact that, in order to consult each different section of industry using tins and cans, nearly 100 new committees had to be formed.

Paint: Before the war, an extensive series of specifications had been prepared for the more important paint materials, many of which were imported. Some

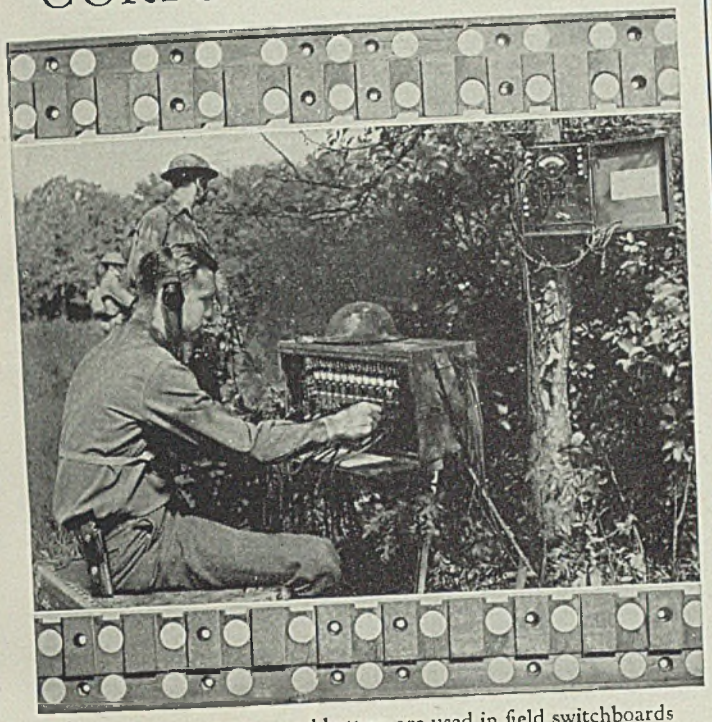
(*Please turn to Page 72*)

TRACTOR SCOOPS 'ER OUT



SERIOUS labor shortage recently forced Timken Roller Bearing Co., Canton, O., to find a new solution to the problem of cleaning out open-hearth furnace slag pockets. This job normally requires the services of 30 men 3 to 6 days; it is a laborious hand and air-tool job. Six laborers with a D-a Caterpillar tractor and Traxcavator recently finished the job in two days. Rapid clearing away of broken slag mechanically made it possible to break slag loose much faster, and to rebuild the furnace in 10 instead of 17 days. More than 1200 tons of steel production was saved by this method.

MAN-HOURS SAVED IN SIGNAL CORPS PRODUCTION



The castings at the top and bottom are used in field switchboards

Zinc alloy die castings have long achieved economies in the field of communications. It was quite natural, consequently, that this metal and production method should serve in many ways in equipment for the U. S. Army Signal Corps.

Typical of the zinc alloy die castings employed in field telephone production are the switchboard key frame castings which border the illustration above. Think of the man-hours saved through the ability of the die casting process to provide —as cast—the numerous openings for the keyboard mechanism in these parts! Think, also, of the conservation of machining and assembling facilities!

These savings are measured today in terms of time and man-hours, but they add up to low cost as well. Perhaps this wartime application of zinc alloy die castings provides the key to many of your present and future production problems.

THE New Jersey zinc ALLOY POT

A publication issued for many years by The New Jersey Zinc Company to report on trends and accomplishments in the field of die castings. Title Reg. U. S. Pat. Off.

STEEL MAGAZINE EDITION No. 5

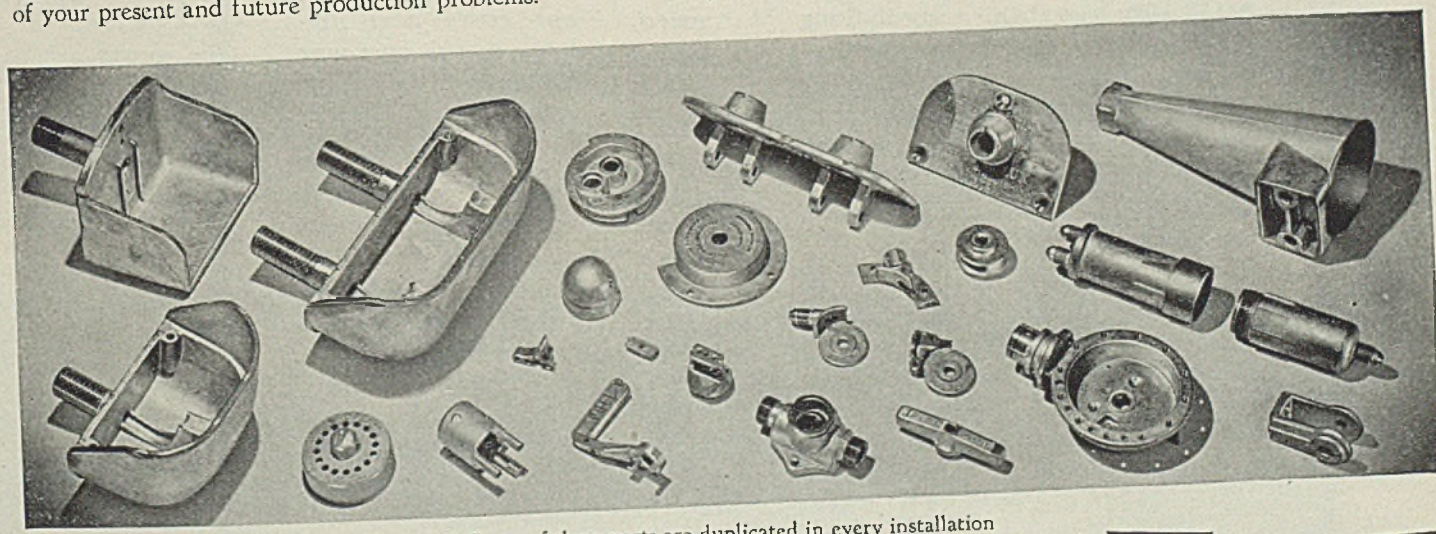
THE VERSATILITY OF ZINC ALLOY DIE CASTINGS

There are many examples of thorough utilization of zinc alloy die castings in producing complicated assemblies. Such strong endorsement of the versatility of this comparative newcomer among high speed production methods and materials occurs in many fields.

The parts illustrated below are particularly up-to-date in this respect because they make up a fire extinguisher assembly used in all U. S. Army tanks. The end-use of this assembly is interesting, but it is the castings themselves which reveal the reasons behind the use of zinc alloy die castings.

Consider these castings in the light of ingenuity of design for compactness—1 part where there would ordinarily be 3 or 4—exacting uniformity for closer fits for operating parts—unusual shapes to utilize every available inch of space.

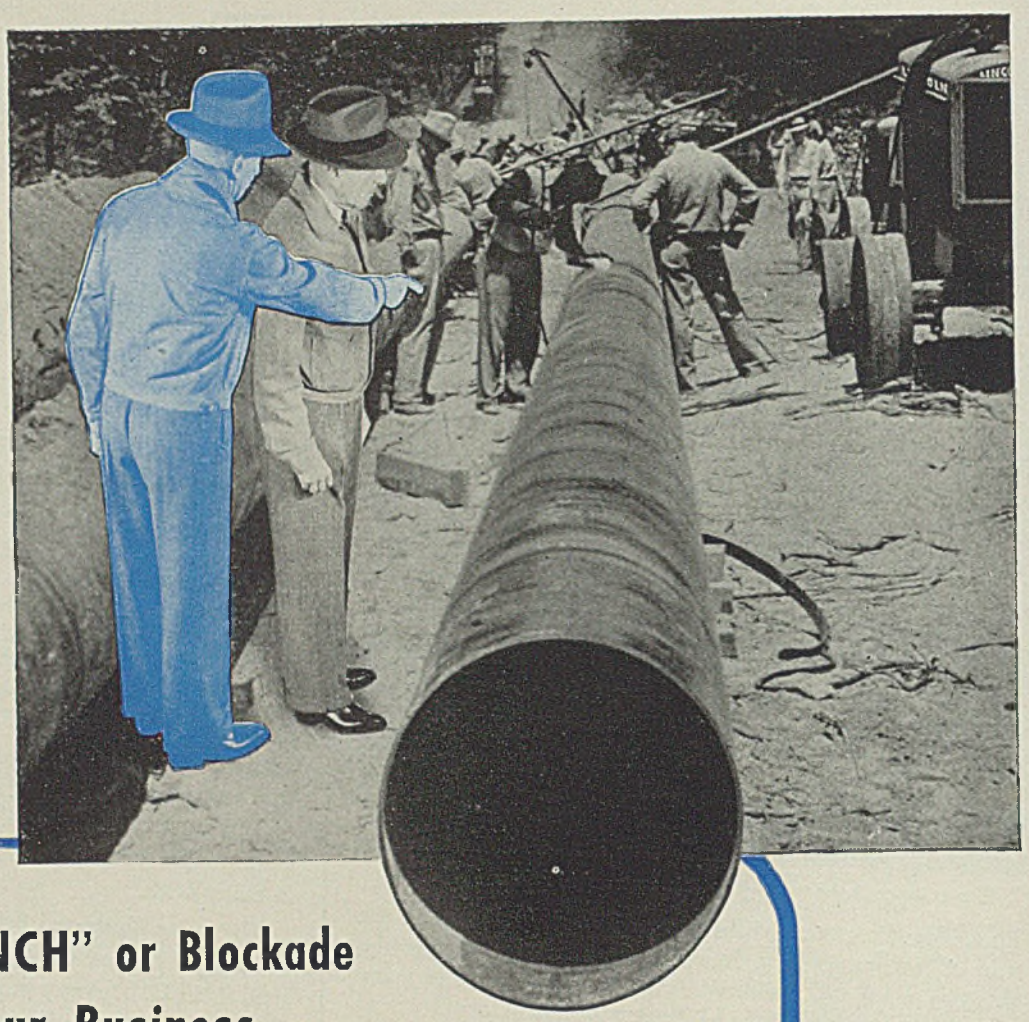
For additional examples of the advantages of zinc alloy die castings, ask us—on your Company letterhead—for copies of five small booklets illustrating applications in five major consuming fields.



Some of these parts are duplicated in every installation

then I said to myself—

EVERY WELDING INCH IS A "BIG INCH"



It's "BIG INCH" or Blockade for Your Business

"Big Inch" didn't just happen — Nazi subs FORCED it — by sinking tankers right and left —just when war industries and armed forces had zoomed demands on the East Coast. We had to do something BIG and QUICK.

ALTER EGO: Right! Our torpedo-firing "competition" forced our hand — forced us to build "Big Inch"—world's largest pipe line — 24" diameter, 1500 miles of it—big enough to pour 300,000 bbl. East Texas oil daily to the East Coast—equal to *150* 10,000-ton tankers.

And the record speed for building this record pipe line is made possible by welding.

ALTER EGO: Well, it's just the same story of competition with ships, planes, tanks, guns and all the other SPEED RECORDS made possible by welding. Competition forces progress.

But, what will take the place of present "competition" to FORCE the same records in speed, lower costs and improved designs in the post war Battle for Business?

ALTER EGO: Just plain sales competition will force change-over to the "Big Inch" method of construction. We'll change or we'll face business "blockade"! So we should start NOW on the right-of-way in welding knowledge if we ever *expect* profit in post-war business.

Ask your inner self whether it would be smart to get welding guidance, of "big inch" caliber, right NOW from

THE LINCOLN ELECTRIC COMPANY • CLEVELAND, OHIO

"PLANT Stretcher"

Utilizes simple materials handling innovation to expand effective floor space

By R. S. WARREN
Cooper-Bessemer Corp.
Mt. Vernon, O.

AN UNUSUAL WAY to break a bad production bottleneck is employed by Cooper-Bessemer Corp., Mt. Vernon, O. This company has expanded its foundry floor space onto the floors of railroad flat cars.

This plant is one of the nation's oldest builders of engines and compressors and is a licensee for the production of Meehanite metal castings. During the past four months, the output of castings has been stepped up more than 80 per cent. As a result of this increase, the foundry was rapidly running out of space for the big flasks that hold the molds into which the metal is poured.

Because of the size of the Cooper-Bessemer products, some of the molds and castings are unusually large. For instance, a base for the compressor shown in Fig. 1 consists of a Meehanite metal casting which measures approximately 20 feet long, 5 feet wide and 5 feet high.

The flasks not only must occupy a considerable amount of space but must stay on the floor several days, for it takes that long for the molten metal in the castings to cool. Under the pressure of war production, the company could not permit the foundry floor space to be crowded for days by the flasks while waiting for the cooling to take place. So discarded freight car trucks and some structural steel were gathered together, and out of these a string of flat cars with steel rails fastened to their floors were improvised. See Fig. 2.

The cars are hauled into the foundry, where the flasks are placed upon them. Then the cars are pulled outdoors again and kept outside until the metal has cooled. At the proper time, the railroad cars are switched back into the foundry and the castings shaken out. Thus a considerable amount of floor space is freed since it no longer is necessary to reserve a large space for the flasks during the cooling period. This permits an increase in foundry output since more

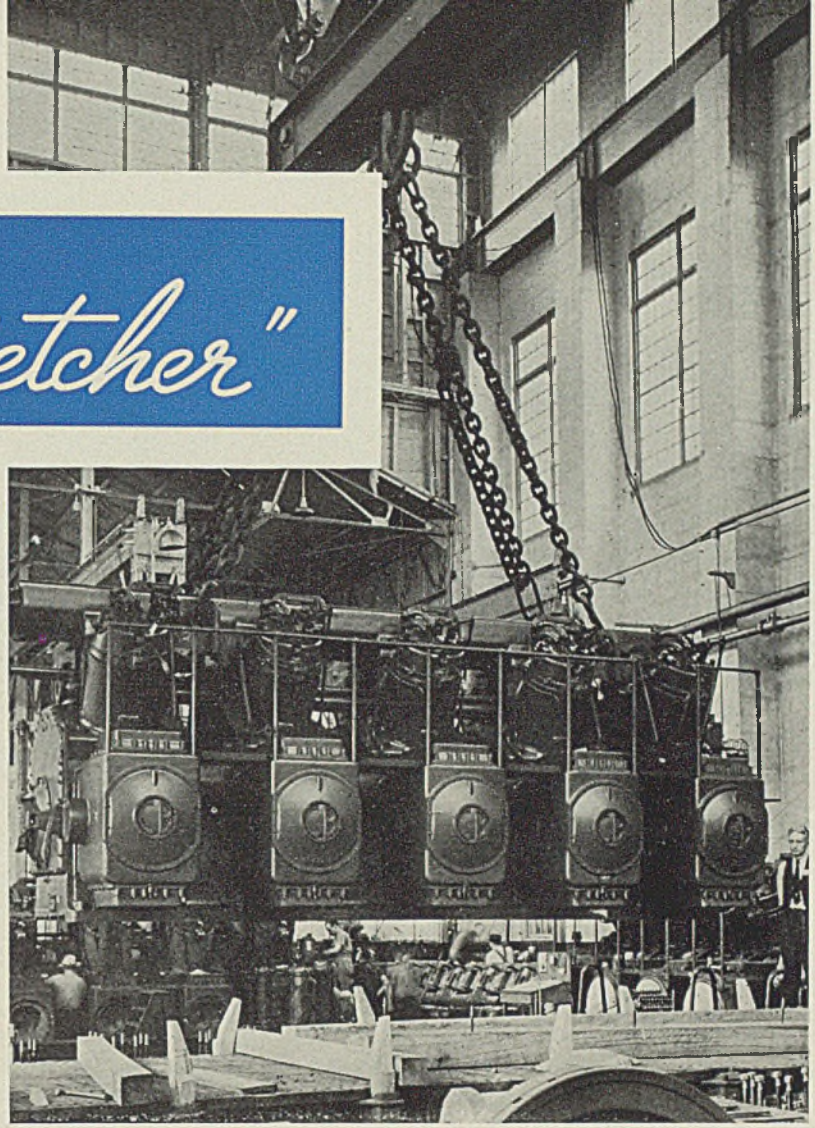
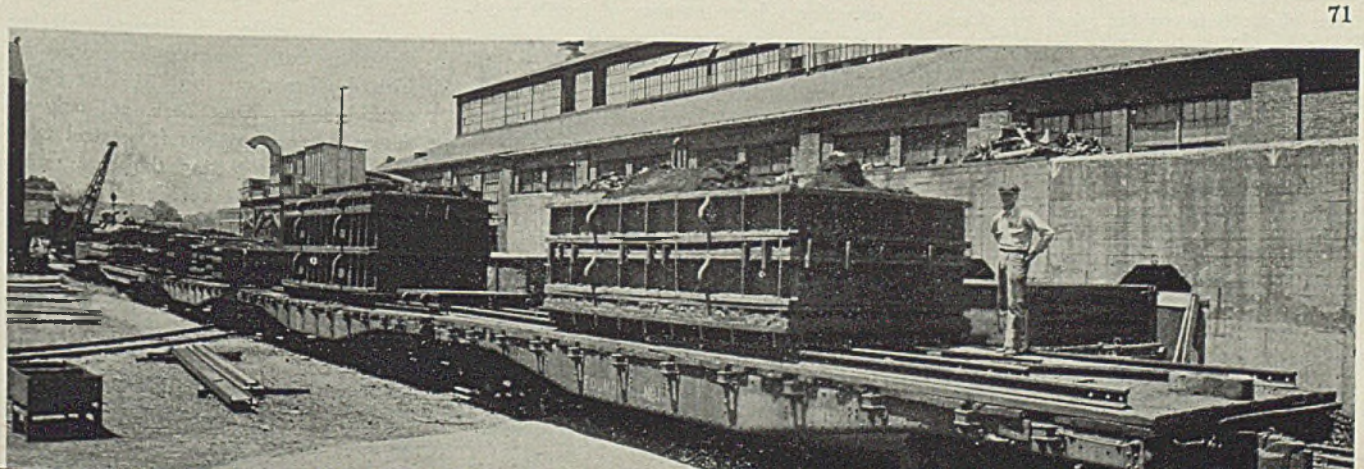


Fig. 1. (View above)—Typical of large castings handled are those in this 1000-horsepower Cooper-Bessemer gas engine. Note special provisions for lifting the 115,000-pound weight of the unit as it is being loaded for shipment

Fig. 2. (Below)—Railroad sidings in plant yards are utilized to hold the large castings while they are cooling in their flasks on flat cars just outside the foundry. Note crane at left



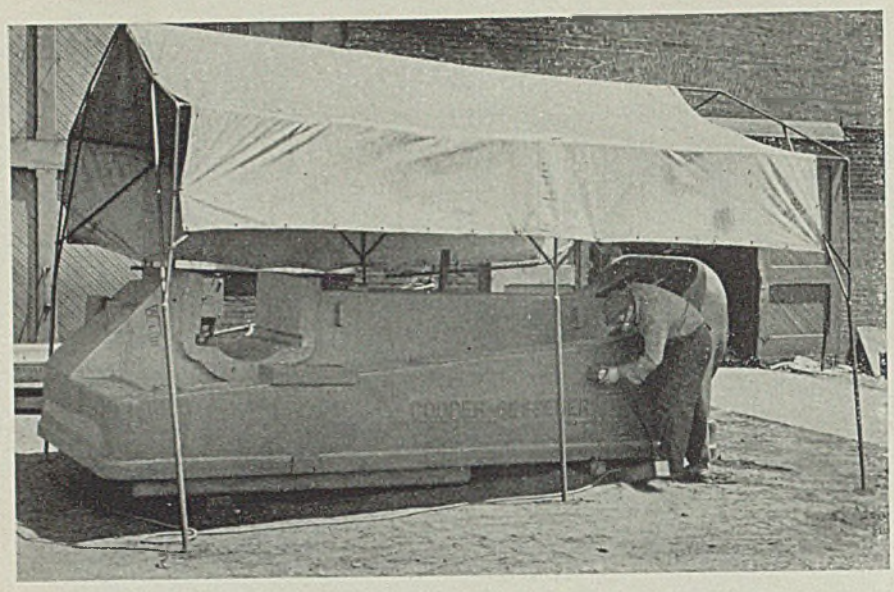


Fig. 3—Canvas stretched over welded pipe frame enables much of the finishing work on large castings to be handled out-of-doors even in hot or rainy weather

space is available for making molds, for pouring and for cleaning operations.

Also, to conserve space on the foundry floor, chipping and painting of many castings is done out of doors during the summer months. A portable canvas covering protects the workman from the hot sun and light showers. See Fig. 3.

Some of the large castings weigh more than 30 tons. These are loaded on special flat cars in the foundry and are chipped and painted in the yard, while on the car.

By careful scheduling, a casting of this type moves from the foundry into the machine shop, never leaving the special car until it is ready for machining and assembly. Thus many handling operations are eliminated—an important phase that helps make it possible to ship many large compressor units within 28 days from the time the large molds are started in the foundry.

Standardization

(*Concluded from Page* 68)

of the sources of supply were cut off, others were restricted. The whole series have been revised so as to permit the use of home-produced material of a lower quality. In some cases substitute materials have been found, and standards for them prepared.

Steel: A committee representative of the service departments and of the steel makers was appointed and examined more than 2000 specifications. *It finally issued a series of specifications providing for only* 58 *different steels—the maximum number considered necessary in wartime.* In order to assist users in selecting the steel most suitable for their purposes, the committee also issued a special report describing the particular characteristics of each steel in the series and the uses for which each is most suitable. Technical information about heat treatment, weldability and mass effect were also given.

Machinery: Standardization of machinery is an obvious development. An interesting example was provided by the case of tooth forms for gears for clockwork mechanisms. This standard was required not so much from the aspect of standardizing the mechanism but from that of the cutters for producing the teeth. Before the war these mechanisms were imported, but it had now become necessary to manufacture them in Britain. To do this the tools for cutting the teeth had to be obtained and this placed a new heavy demand on the tool makers. As no two manufacturers of the mechanisms called for the same shape of cutter, each order had to be treated separately, and necessitated the manufacture of new forming tools which involved the use of highly skilled workers.

An analysis of the orders placed with one tool firm revealed that no less than 700 *different types and sizes* were being demanded. Thanks to the standardization that has now been effected, after consultation with all interested sections, the requirements of the industry can be met with no more than 25 *types and sizes* of tools, and they can now be produced in quantity by semi-skilled labor. Incidentally, the standard has resulted in the production of a tooth form considerably more efficient than those previously in use.

Consumer Products: An interesting development in the activities of the institution, and one which has now assumed great importance, is in regard to standardization of consumer products in the ordinary retail trade. Soon after the war a new division was formed in collaboration with the Retail Trading Standards Association, the Board of Trade and other bodies. This has worked out a series of standard specifications for a large number of textile products, both in connection with the manufacture of general textile articles and in the production of clothing (hence the introduction of our *utility* clothes). Holloware is another product now being standardized and many others are expected to follow suit.

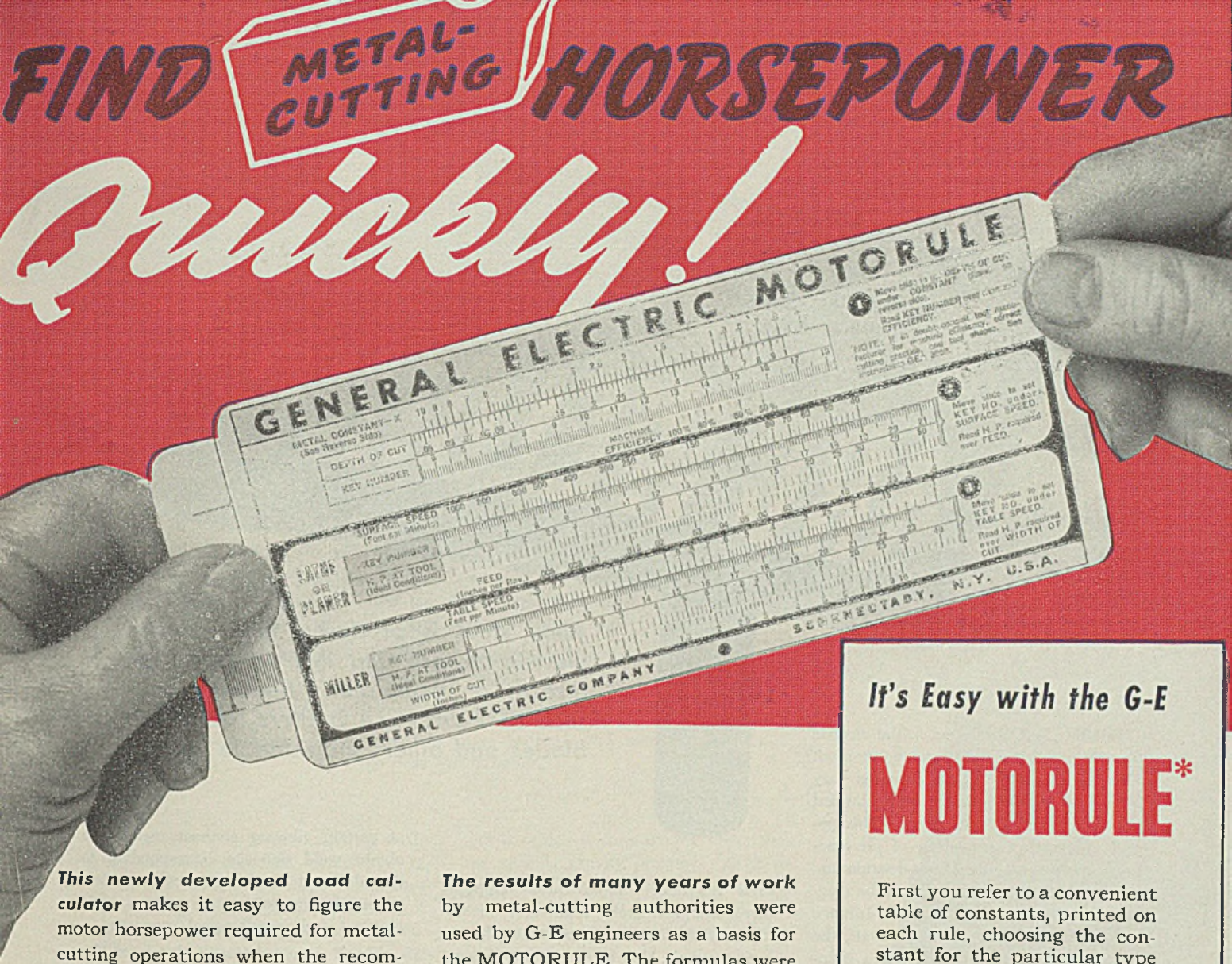
Packaging: Here again the field for work is vast. It was largely as a result of the success of the tin can standardization scheme that the BSI has turned more and more attention to packaging. The main reason is that the packaging field offers tremendous scope for the salvage of waste materials which can be of extreme value in the war effort. Hence, the BSI has now set up committees which are working out schemes for standardizing glass containers, all forms of paper and cardboard packs, all plastic and wood containers and all containers made of any composite materials. Much the same principles as were adopted for the tin scheme are being used again—reduction of sizes and of shapes (i.e. abolition of unnecessarily thick walls, padded corners, etc., and the introduction of curves in place of corners, in some cases).

Standardization of book and magazine sizes, of bibliographical index classifications, of building materials, of machine tools and of spare parts are just a few more of the BSI's activities, I hope this short survey will have given some impression of the extent and importance of these activities as part of the general production scheme.

New Stripping Bath Strips Copper from Steel

A bath called Unichrome alkaline stripping bath recently developed by United Chromium Inc., 51 East Forty-second street, New York, not only removes copper coatings from steel without etching or pitting the base metal, but removes it at speeds up to 0.001-inch in 10 minutes or less. The bath is said to consist of a mildly alkaline, nontoxic solution, and eliminates the use of mechanical means for removing the copper.

FIND METAL-CUTTING HORSEPOWER Quickly!



This newly developed load calculator makes it easy to figure the motor horsepower required for metal-cutting operations when the recommendations of the machine builder are unavailable. Its advantages? You can avoid *undermotoring* and save yourself production delays; you can avoid *overmotoring* and save the nation vitally needed steel, copper, and aluminum.

The G-E MOTORULE is accurate for a wide variety of cutting operations on lathes, drills, milling machines, and planers. It works on a wide range of materials, because you start from a convenient table of constants for the material being cut.

The results of many years of work by metal-cutting authorities were used by G-E engineers as a basis for the MOTORULE. The formulas were checked against actual load tests, and leading machine-tool builders were consulted.

The MOTORULE will help you in making sure of adequate motor capacity on machines being put to new war work, and in selecting motors for machines formerly driven from line shafting. To get your MOTORULE, just get in touch with your G-E Motor Representative. Or, if you wish, mail the coupon direct to General Electric, Schenectady, N. Y.

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First you refer to a convenient table of constants, printed on each rule, choosing the constant for the particular type of metal to be cut. Then by setting the scales to the known cutting speed, feed, and cut, you arrive at the cutting power required on the basis of ideal tool and machine conditions. Complete instructions are furnished with each MOTORULE.

*The MOTORULE is not intended to supplant the instructions of machine builders as to the power requirements of their machines. It is offered to fill the gap when these recommendations are unavailable.

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Schenectady, N. Y.

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Company.....

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By J. A. NEUMANN, Ph.D.
Director of Research
American Agile Corp.
Cleveland

Making Alloy Steel by ARC WELDING

Alloy steel is produced in a minute electric furnace and then is deposited directly on tools, dies. Reclaims tools such as concrete beaters, chopping blades and others subjected to impact

PRODUCTION of steel in the electric furnace is today a very common method. The capacities of electric furnaces vary from 1 to 10 tons, a heat being tapped out about every 5 or 6 hours. This period allows the completion of all reactions and transformations—deoxidation, alloying and so on—involved in the electric furnace process. The arc furnace being closed against atmospheric air, the reductive atmosphere inside has a refining influence and permits the actual alloying process without danger of oxidation of the alloy metals, introduced mostly as the respective ferro-alloys.

The chemical reactions are given time, and all transformations can easily be controlled. The subsequent pouring and the so-called cold-melt practice produce then the desired alloy steels.

The electric arc which is established between a coated welding electrode and the metal to be welded can be considered a minute continuous electric furnace where alloy steel can be manufactured in a manner similar to the process occurring in the electric steel furnace. The conditions which are fundamentally changed in this minute furnace compared with the electric steel furnace could be listed as in Table I.

The basically changed conditions make any control like the ones exerted in the electric furnace impossible and therefore call for a new way of controlling the process occurring in the electric arc.

The temperature can be slightly regulated through the amperage used, but only within narrow limits (a few hundred degrees). Since these temperatures are extremely high and mostly higher than the boiling points of the alloying metals, this factor cannot be employed as a main source of control. We see, therefore, that the entire process of producing alloy steel through arc welding has to be regulated by a new major component of the welding rod — the electrode coating.

The coating of tool steel or alloy steel electrodes, which means electrodes that will give a weld deposit of a certain desired chemical analysis, has to fulfill three major tasks: First, when based on plain mild steel or low-alloy wire, the coating has to overcome the losses of carbon, manganese and silicon or other desirable elements contained in the core wire. Also, it has to avoid increases in nitrogen and oxygen as is done with ordinary mild-steel electrodes.

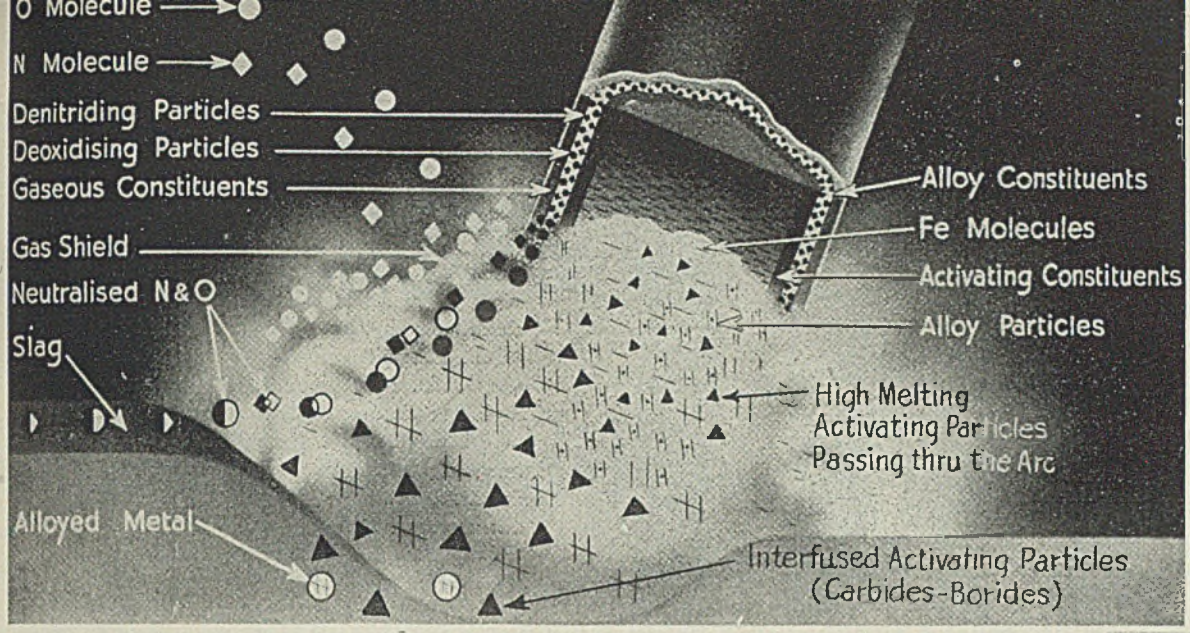
Second, it must stabilize the arc and produce a favorable atmosphere; that is, to close the arc from the surrounding atmosphere by inactive gas shields. This is done by maintaining an atmosphere of carbon monoxide, carbon dioxide or hydrocarbons which are supported by the volatilization of certain refractory materials.

Third, it must furnish to the molten pool the necessary additional amounts of certain alloying elements needed to obtain weld deposits corresponding to the different kinds of steel in their chemical composition as well as their physical and metallurgical properties.

Fig. 3 is a schematic sketch of the process occurring in the electric arc during the (Agile) alloying process. It shows that the nitrogen and oxygen molecules of the atmospheric air are withheld from the arc by a shield of inactive gaseous constituents. Should, however, some nitrogen or oxygen molecules succeed in penetrating the shield, these molecules will enter some reaction with denitrifying and deoxidizing particles contained in the electrode coating and be deposited in the slag.

By these means, the electric arc is practically closed from the air and resembles closely an electric steel furnace. Here, however, the furnace lining, which determines the basic, acid or neutral character, is replaced by a gas-shield or gaseous wall that is continually renewed, furnishing protection against entrance of nitrogen and oxygen during the whole process.

The actual alloying—that is, the introduction of the desired alloys into the weld—resembles more the processes occurring in the electric furnace, although great attention must be given to the alloy-furnishing materials (mostly ferro-alloys) and their behavior at these high



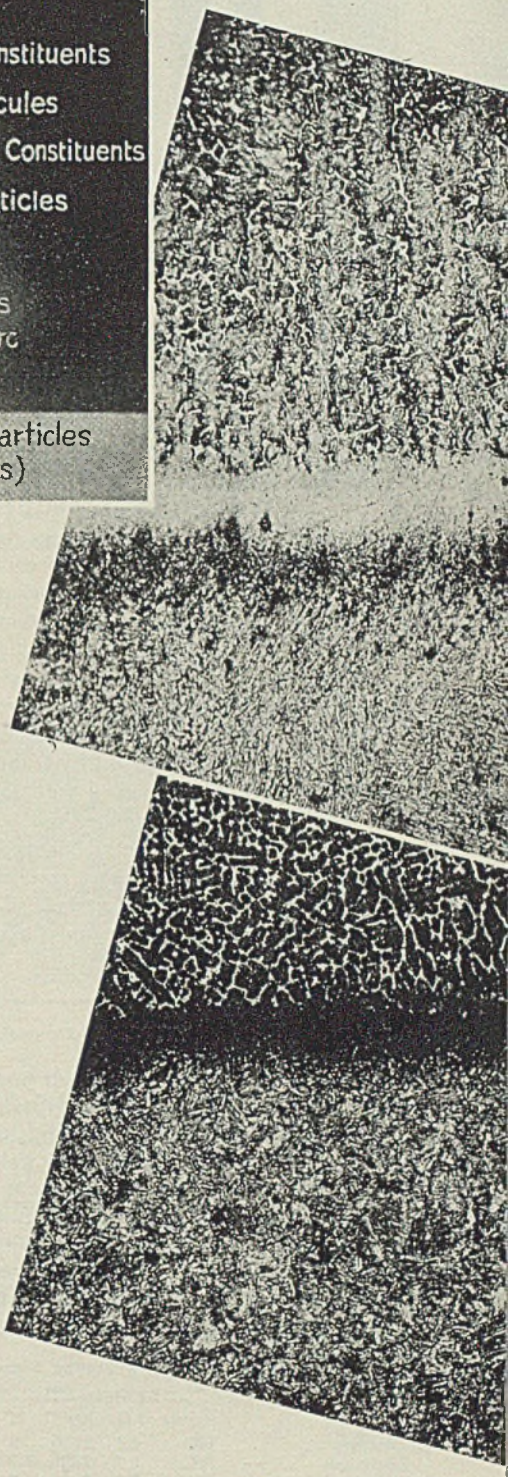


Fig. 1. (Center, opposite page)—Same chisel as in Fig. 2. Here it has been driven through plate with only five hammer blows

Fig. 2. (Upper right, opposite page)—Chisel tipped with the weld deposit shown cutting exceptionally hard low-alloy plate. Weld deposit easily withstands severe impacts such as imposed here

Fig. 3. (Above)—Diagram showing alloying action that takes place in the electric arc process

Fig. 4. (Right)—Typical microstructure of alloy material and parent metal

Fig. 5. (Lower right)—Note complete fusion between alloy metal and parent or base metal here

temperatures. It is natural that the coating thickness and the percentage of contained alloy-furnishing compounds are closely related to the analysis of the weld metal that is to be obtained. The thicker the coating (the greater the volume of the coating), the more alloying material will enter into reaction and a higher percentage of alloying metal be obtained in the weld deposit.

To make this fact somewhat clearer, let us make the following theoretical consideration: Suppose we have a mild-steel wire coated with a certain alloying element. Assume that no quantitative losses occur either through reaction with the atmosphere or by vaporization of certain elements. If the proportion of the cross-section area of the wire to the cross-section area of the coating annulus were 1:1 (which means that the same volume of coating and of steel are present) and the specific gravities of coating and steel were equal, the weld deposit should be an alloy containing 50 per cent steel and 50 per cent of the alloying element used as coating materials.

The coating, however, always consists of finely pulverized materials of 200 mesh or over. Then with a considerable percentage of flux ingredients furnishing deoxidizing, denitrifying and slag-forming particles, this specific gravity of the coating can never be reached. The actual specific gravity varies between 3 and 6, which is considerably lower than the specific gravity of steel. As a result, it has been determined that a maximum alloying of 20 to 25 per cent takes place when using equal volumes of steel and coating.

The behavior of the different coating ingredients should be considered in greater detail.

The most important coating ingredient for alloy or tool steel electrodes is carbon, not only as an alloying element but also for the adjustment of the desired atmosphere. The resulting carbon monoxide and hydrocarbon gases are formed in balanced proportions in the arc and are one of the main contributions for maintaining the atmosphere in a reductive or nonreductive state. An excess of these gas-producing materials encourages excessive deoxidation, while it also replaces losses in carbon content and builds up additional carbon in some desirable form, as for instance in the form of carbides. Special care has to be exercised to prevent porosity of the weld deposit, which can be caused by a noncalcined atmosphere or by the reaction of hydrocarbon gases with the carbon of the steel, resulting in fish-eyes.

Three modifications of carbon are used in the coating: Hydrocarbons like cellulose, etc.; wood charcoals; cokes and graphites. As the temperature of the disintegration of these carbons varies, the first two are used exclusively in maintaining the reduction (reducing and neutralizing of the atmosphere), while the latter is used to give excessive carbon to the alloy. But in contrast to the first two, an incomplete combustion must occur.

In practically all electrodes, either sodium or potassium silicate is used as a binder, resulting in a silicate content of about 10 per cent. Since the silica resulting from the decomposition of either silicate gives no reaction with the atmosphere over 2000 degrees Cent., it

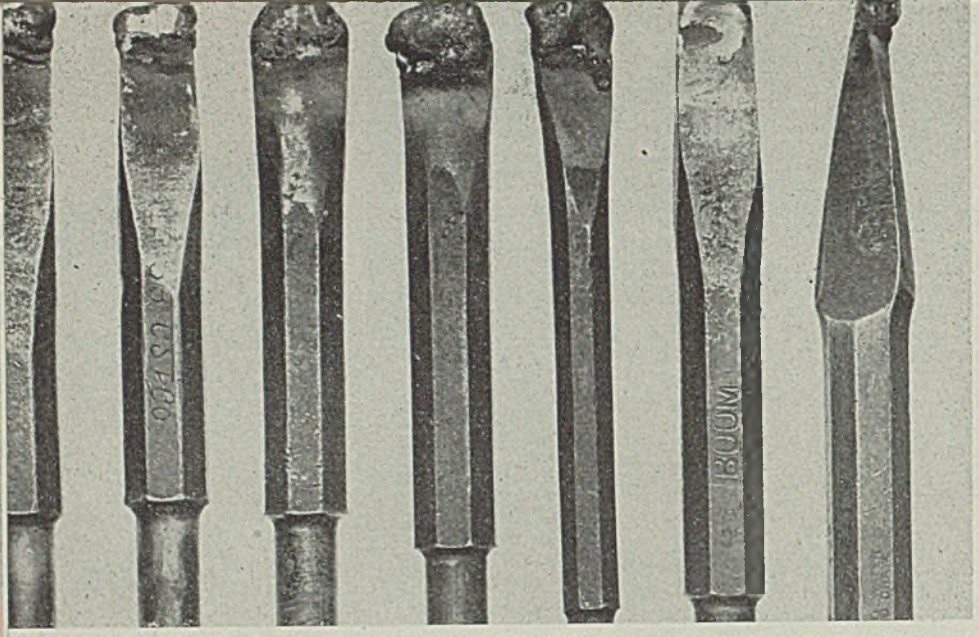


Fig. 6—These seven pneumatic chisels were reclaimed using only one 18-inch electrode 5/32-inch in diameter

is doubtful whether the presence of carbon at this elevated temperature makes it possible to increase the silicon content in the weld. The other slag-building ingredients of the coating which we can put under the heading of oxides (like iron oxide, calcium oxide, magnesia, silica and titanium oxide, etc.) have the same purpose as the lining of the furnace and are added in proportions to be either acid, basic or neutral in manner. The molten slag, held at a specific gravity and melting point that will allow the raising of the slag on top of the molten pool, thereby purifies the weld and protects it against rapid cooling.

At this point it might be well to consider briefly the effects of the various ingredients of the coating on the weld metal.

Manganese: Among the alloying elements, manganese is present in the coating as a high, low or medium-carbon ferromanganese, which is a first-class deoxidizer and is used for coarsening the grain. A manganese content of 0.5 per cent in the deposit is the criterion for making forgeable welds. The carbide-hardening tendency of manganese is slightly greater than that of iron and contributes moderately to hardenability.

Manganese in combination with other alloys causes the steel to harden very rapidly and deeply. In quantities of over 1 per cent, manganese becomes an integral part of the oil-hardening non-deforming steels. Manganese content also increases the toughness of the steel.

Chromium is added to the coating in the form of a pulverized ferrochromium, and sometimes also chromium-plated electrode wire is used. In the percentage range of 0.25 to 1.5, it contributes to wear resistance and toughness. It also fulfills the requirements of grain refining in steels. About 4 per cent chromium in a weld deposit gives moderate red-hard properties which are necessary for hot-forging dies. A very interesting tool steel is the 13 per cent chromium ledeburitic steel, which possesses remarkable wear-resisting properties.

Nickel can be added to the coating either in the form of nickel oxide, nickel carbonate or by using nickel plated electrode wire. While it is used only seldom in tool steels, it plays an important part as an alloying element in chromium-nickel austenitic steels.

Molybdenum is added to the coating as either ferromolybdenum or calcium molybdate. Molybdenum has remarkable alloying properties. It is highly efficient since as much as 90 per cent of the molybdenum content of the coating is transferred to the deposited metal. Its strong carbide-forming tendencies are more effective than those of chromium. Furthermore, molybdenum appears to be a good substitute for tungsten in high-speed steels. In conjunction with silicon-manganese, molybdenum increases the toughness, refines the grain and gives resistance against shock stresses.

Tungsten is added to the coating as ferrotungsten or tungsten powder. It contributes greatly toward hardenability. However, large quantities must be added if tungsten is to be relied upon to produce an abrasion resisting tool steel. A content of over 12 per cent tungsten in addition to chromium gives a steel with high red-hardness, a characteristic of high-speed steels. A content of about 1 per cent tungsten contributes to the wear resistance and grain refinement of the steel. It is, like molybdenum, very effective in the arc.

Vanadium: This is added to the coat-

TABLE I—Comparison of Melting Conditions

ELECTRIC FURNACE	WELDING ARC
—Closed against atmosphere, no access of air	—Surrounded by atmosphere containing nitrogen and oxygen, which are both undesirable elements in steel
—Temperature is somewhat higher than melting point of iron and can be regulated	—Temperature lies between 3800 and 4000 degrees Cent. and cannot be regulated
—Chemical, physical and metallurgical transformations are stretched over a period of 5 to 6 hours	—All reactions occur in less than 0.01-second when the material passes through the arc
—Cooling rate can be adjusted by decreasing temperature adequately	—Cooling rate cannot be controlled by decreasing temperature moderately, since interruption of the arc decreases temperature abruptly.

TABLE II—Showing Binary Carbides, Borides and Nitrides

	Carbide				Boride				Nitride			
Element	Formula	S.G.	Mp°C	H	Formula	S.G.	Mp°C	H	Formula	S.G.	Mp°C	H
Titanium	TiC	4.2	3250	9	TiB_1	...	....	9	TiN	...	2950	8
Zirconium	ZrC	6.7	3250	8-9	Zr_2B_1	3.5	2950	8	ZrN	..	2980	8
Vanadium	VC	5.3	2800	9	V_2B_4	...	....	..	VN	..	2050	..
Chromium	Cr_2O_2	6.6	1660	8	Cr_2B_2 / CrB	5.4	....	8	CrN	..	1000	..
Molybdenum	Mo_2C	8.9	2500	9	Mo_2B_4	7.1	....	9	No data available			
Tungsten	W_2C	16.2	2950	9	WB_2	9.6	....	8	No data available			
Boron	B_6C / B_4C	2.6	2350	9	.....	...	....	..	No data available			

Note:
S.G. denotes Specific Gravity.
Mp°C denotes Melting Point in Degrees Centigrade.
H denotes Hardness on Mohs' Hardness Scale.

TABLE III—Typical Analyses of Chisel Steels, in Per Cent

Carbon	Silicon	Manganese	Tungsten	Chromium	Molybdenum
0.55	2.00	0.80	..	..	0.40
0.50	1.00	0.40	..	..	0.50
0.40	0.90	0.25	2.00	1.00	....
0.50	1.00	0.25	1.00	1.00	....

Man-hours for re-tooling save man-days in production —

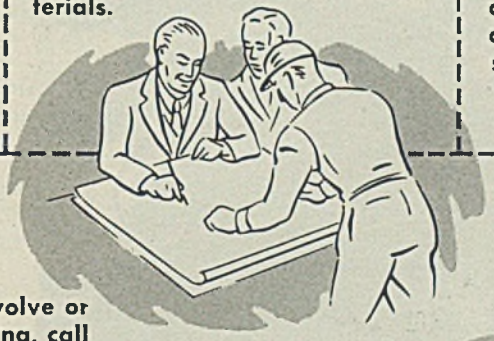
Time after time, imaginative but practical Babcock & Wilcox Tube Co., engineers have proved that changes *to* tubing or changes *of* tubing can save time, money and trouble . . .

As in the case of a tank part,

As in the case of a tank part, made first from solid rod, then from cold drawn tubing—with difficulty. B&W engineers showed how hot finished tubing of greater wall thickness could easily be straightened to meet specifications fully—without difficulty.

Or the case of an Aircraft engine part,

Or the case of an aircraft engine part, formerly made from turned stock now made from a lighter length of B&W Seamless Steel Tubing—faster with less turning and with savings in both time and materials.



And the case of an Aircraft manufacturer.

And the case of an aircraft manufacturer who asked for a size of cold drawn tubing we couldn't furnish for months. B&W suggested hot finished tubing, devised a special machining method. Machining cost went up, but overall cost came down and deliveries started immediately.

TA-1236

If your design or production does involve or might involve use of mechanical tubing, call on B&W. Given your problem—rather than just tube specifications—B&W can give you the best possible solution—every time.

BABCOCK & WILCOX TUBES

HOT FINISHED ALLOY STEELS
COLD DRAWN CARBON STEELS

THE BABCOCK & WILCOX TUBE COMPANY
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ing in the form of ferrovanadium in small quantities for toughening effects and for keeping the grain small. Vanadium, together with tungsten and chromium, may also be added to increase the red-hardness of the steel. Vanadium is a good deoxidizer and has strong carbide-forming tendencies.

Cobalt: This element has practically no application in the coating of tool steel rods.

Silicon: As an alloying element, silicon is added to the coating either as ferrosilicon or as silicon manganese. Silicon should be present in all tool steels over 0.1 per cent to lower the critical cooling speed and the melting point, and to some extent to give toughness and strength to tool steels, although silicon is never used alone for this purpose.

All the effects of the preceding elements in tool steels are described in detail in *Practical Metallurgy* by George Sachs and Kent R. Van Horn and *The Alloying Elements in Steel* by Edgar C. Bain.

Titanium: Ferrocarbon titanium increases the ductility and is added as a deoxidizing agent. The carbide forming tendency of titanium is very great, and extremely hard titanium carbides can be formed. The powerful affinity of titanium for nitrogen makes it a denitrifying agent in the coating. In the ordinary electrode, titanium dioxide (rutile) in the presence of carbon gives titanium plus carbon dioxide. If this titanium appears with a bright fracture, it contains a slight excess of carbon. A 1.5 to 2.0 per cent titanium steel with less than 0.5 per cent carbon has no tendency to harden up quenching. Titanium also reduces martensitic hardness and prevents austenitic formations in chromium steels. Titanium also has the effect of increasing the tensile strength and hardness.

Boron is added to the coating in the form of ferroboron and is a super-deoxidizer, effective in extremely low percentages. As this element is closest to carbon, the slightest addition of boron affects the hardness and the toughness. Boron is never used alone because carbon-boron steels would be too brittle. In general, boron decreases the malleability. The alloying is similar to that of vanadium, especially in refining the grain. Boron forms carbides which are exceptionally hard. Also it forms with other alloys the so-called borides, as for instance chromium boride and titanium boride, which make boron additions to the steel very promising.

Arc Transfer: Thorough investigations show that the transfer of material through the electric arc goes on very rapidly with sufficient current. The material passes through the arc either in the form of little drops or in the form of vapor. By using high-speed photographic exposures and counting these drops, it was found that from 250 to 300 droplets were passing from the electrode to the weld metal in one second.

Forming Alloys: Since all cutting tool steels are composed of hard intermetallic particles—mainly carbides which are embedded in a matrix (martensitic or pearlitic)—it is now possible to prepare these high-alloy steels containing carbides by means of arc welding in two different ways:

First, by using ready made intermetallic compounds as a part of the coating of the electrode. See Fig. 3 for activating constituent.

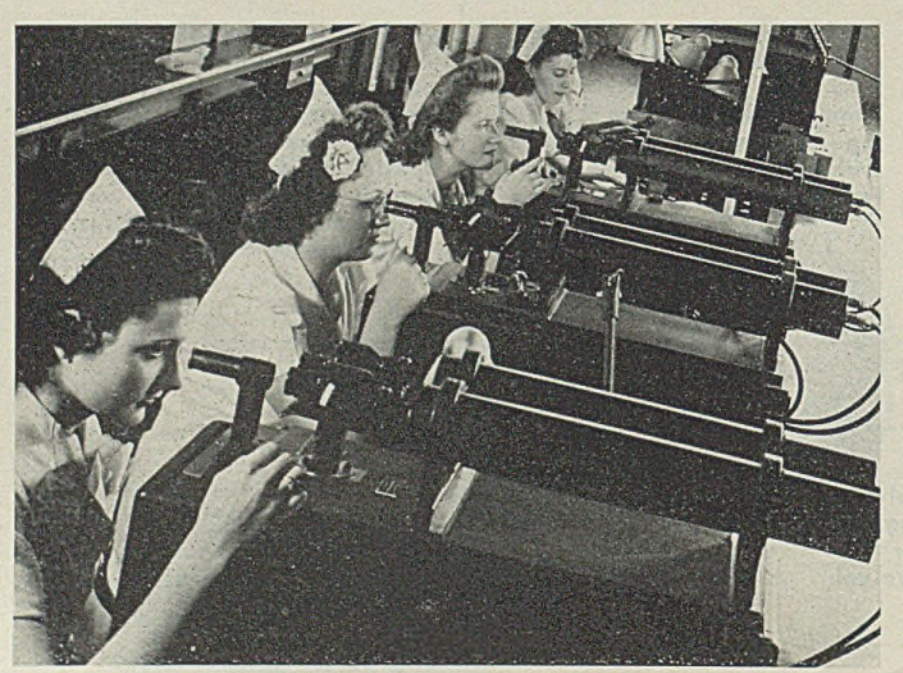
Second, by forming the desired intermetallic compounds through reactions taking place in the electric arc. In the latter case, the elements forming the compounds are furnished by the coating material. The intermetallic compounds contained in the electrode coating pass through the arc with the enormous speed mentioned above. Because of their extremely high melting point, they cannot melt completely or be completely decomposed.

The molten steel drops passing through the arc have, at this temperature, an extremely high surface tension which allows them to absorb those molten hard particles. At the moment the drops, now containing these hard particles, contact the molten pool, they solidify so fast that an even distribution of carbides is assured.

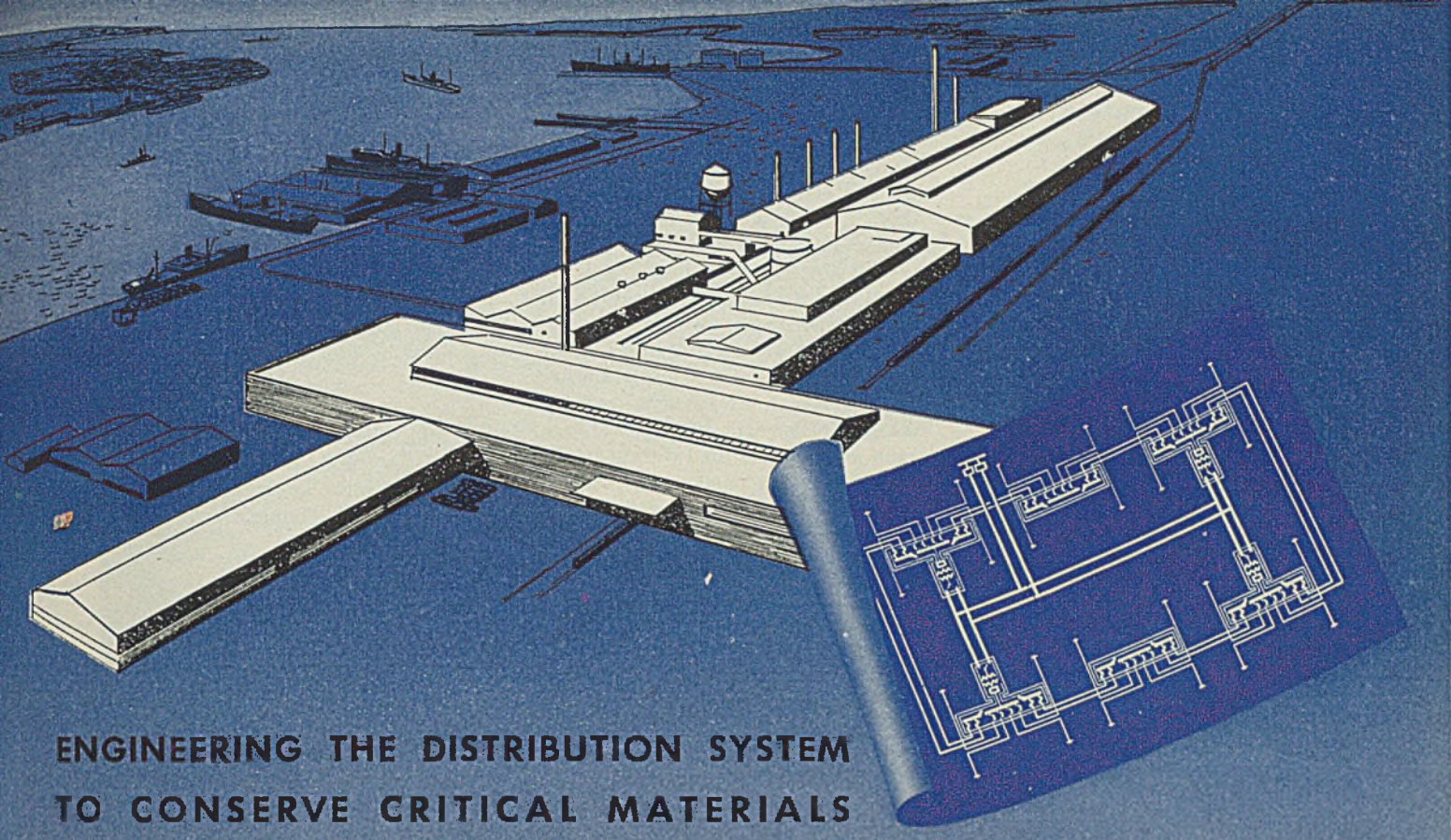
When these intermetallic compounds are not already present in the coating, they can be manufactured by using certain alloy-furnishing coating ingredients like ferro-alloys. These ferro-alloys or salts decompose or vaporize at a much lower temperature than the aforementioned intermetallic compounds and furnish the desired elements in their atomic state.

Through proper composition of the coating, the necessary reactions to form the intermetallic compounds can be induced. On account of the rapid solidification of the weld deposit, even the specific heavy intermetallic compounds cannot sink to a lower level within the deposit. Thus even distribution of this intermetallic compound is assured. Thorough examination of the deposited beads has shown that the hardness of these weld metals is very uniform. Practically no difference in hardness or structure can be detected throughout the length of a bead produced by an 18-inch elec-

INDUSTRIAL "MACHINE GUNNERS"



THESE GIRLS "sighting" into binoculars mounted in front of collimators are inspectors in the binocular assembly room of Westinghouse Electric & Mfg. Co., Mansfield, O. The collimators contain an optic system permitting a thorough check of each binocular for sharpness and definition of image, and test alignments. Electric air cleaners protect the binoculars from dust and other air-borne particles. The girls work in starched uniforms and wear no facial makeup as even a flake of powder on the lens would obstruct the focal plane



ENGINEERING THE DISTRIBUTION SYSTEM TO CONSERVE CRITICAL MATERIALS

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A vital war plant faced the problem of providing reliable power supply. The distribution system originally planned required 70,600 pounds of copper.

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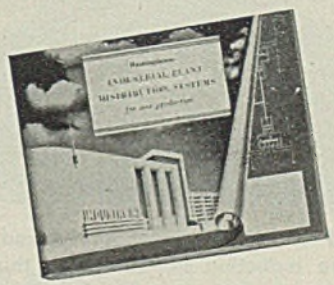

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trode. Table II gives the compositions and other interesting data about interfusing compounds which might be produced through this procedure.

Application to Chisel Steels: As an example of application of this new steel manufacturing process, the preparation of a typical chisel steel by arc welding can be as given. In order to reclaim or manufacture chisels by arc welding, the weld deposit should be close to the analysis of typical chisel steels given in Table III. In this case, the welding wire itself must have this analysis and no further alloying would be necessary if a complete neutral atmosphere could be established in the arc. However, wire of this composition is difficult to obtain—the high silicon content rendering drawing extremely difficulty. The nearest types of wire are the SAE 9255 and 9260, which, however, would have to be increased in carbon and additions of molybdenum and tungsten made. Due to the difficulties in obtaining such wire, other ways had to be found to obtain an equivalent steel in the we'd deposit. Besides the common alloying elements, a number of other elements were tried. Extensive research indicated that the following elements cause effective hardening and are favorable for the formation of the necessary interfused particles: Zirconium, titanium, tungsten, tantalum, vanadium, molybdenum and boron.

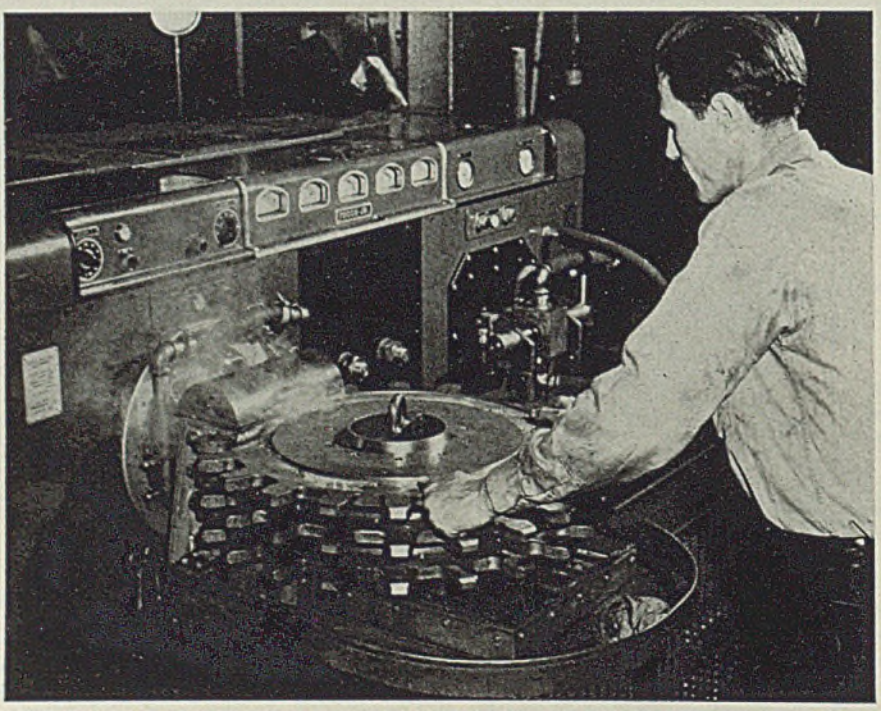
Figs. 4 and 5 show the microstructure of these alloy steels made by arc welding and the complete fusion between the weld metal and the parent metal. The extreme toughness and thorough binding might be caused by a very low percentage of boron since approximately ten times as many atoms per unit area insure thorough binding with the parent metal as compared without boron.

Fig. 6 shows a number of reclaimed pneumatic chisels. The fact that these seven chisels required but one 18-inch long tool steel electrode 5/32-inch in diameter illustrates the great economy of this application. The chisels are pictured before grinding to shape. Fig. 2 pictures one of these tipped chisels worked on a ¼-inch low-alloy steel plate. Fig. 1 shows the same chisel after it has been driven through the plate with only five hammer blows. It shows no trace of bluntness or chipping.

The use of this tool steel electrode can be extended to various salvaging and reclaiming applications on medium-carbon steels such as the building up of edges on punches, shear blades, dies, and all types of machine cutting tools. Also, tools such as concrete beaters, chopping blades and others *subjected to impact* are readily reclaimed for longer working life. Since it is possible to use a thin deposit for slight damages, the repair, including the grinding, takes but a few minutes.

Actual application is simple enough for the average welder to carry out the repair and salvaging that fits his particular job. By reclaiming vital dies and tools, this alloy-interfusion process aids today's war production greatly. Too, it promises wider applications and development for the future.

HARDENS THREE SPROCKETS "AT ONCE"



FIFTEEN 28-INCH sprockets per hour—used to drive tracks of high-speed, heavy military tractors in service at airports—are induction hardened by this Tocco machine in the plant of a Cleveland tractor company. Installed by Ohio Crankshaft Co., Cleveland, where the machine was designed, the unit handles three sprockets at one time. Each of these sprockets has 20 teeth each tapered 1 inch in thickness at its base to about ¾-inch at the top

Offers Engineers Radio-Formula Book

Most frequently used mathematical formulas, tables, data and standards in the field of radio and electronics are included in a pocket-size handbook recently published by Allied Radio Corp., Chicago. Edited by Nelson M. Cooke, chief radio electrician, United States Navy, it eliminates time-consuming search through numerous books for information constantly used by radio and electronic engineers and maintenance men.

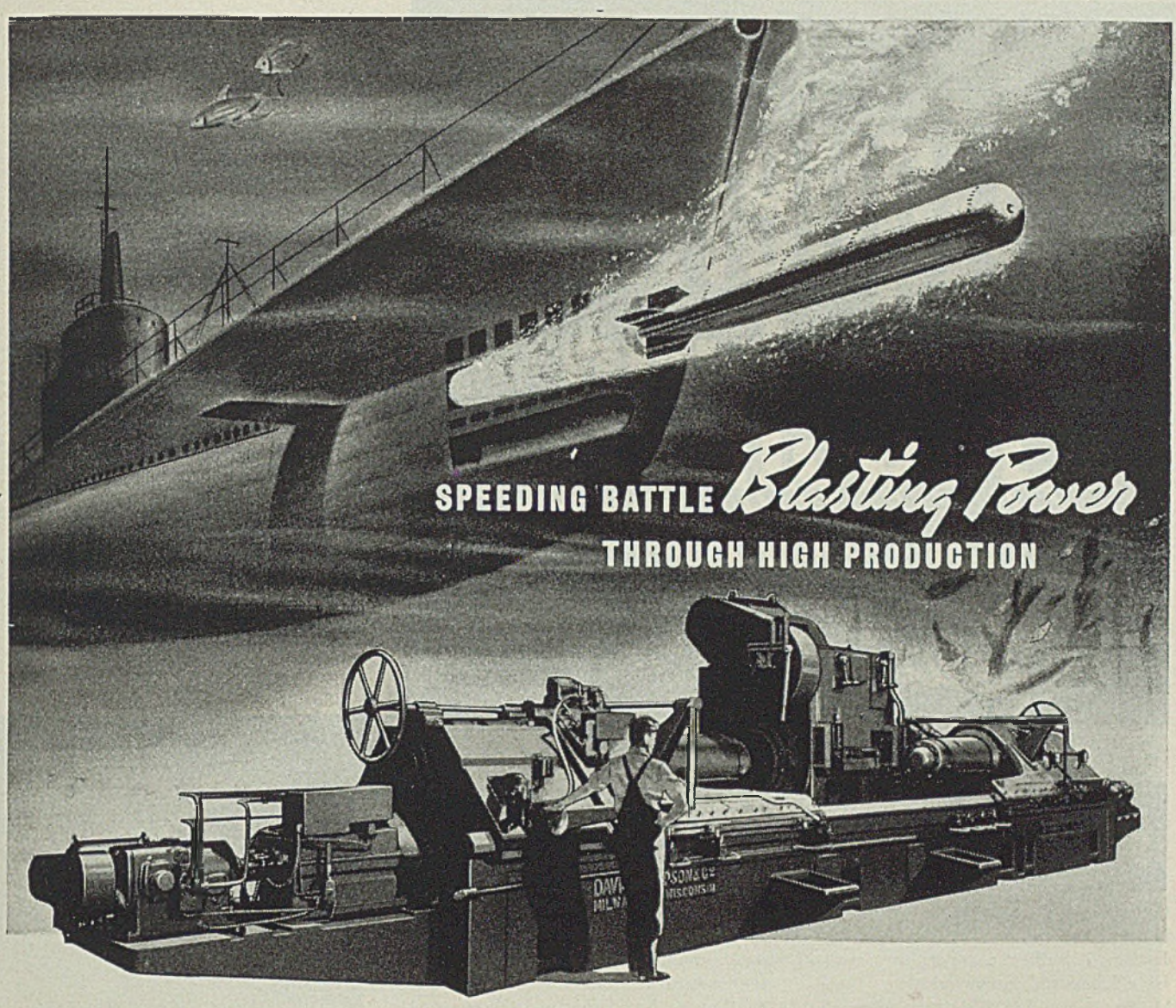
The booklet provides formulas, tables and data covering such subjects as Ohms' law; inductance, reactance, impedance; resonance; the use of the exponents, trigonometric relationships, logarithms, radio color codes, abbreviations, mathematical symbols, wire tables, etc. Included also is a condensed selection of formulas pertaining to meters and vacuum tubes.

Copies of the publication are offered free to engineers and maintenance men who send in requests on firm letterheads. To all others it is priced at 10 cents.

Develops Coating for Degreasing Baskets

A new modified polyvinyl alcohol resin in solution which forms a tough, resilient solvent-proof, abrasion-resistant coating when used on wire transporting and degreasing baskets is reported by Resistoflex Corp., Belleville, N. J. It is said to coat wire baskets with a film that will not tarnish or otherwise injure the most highly finished metal parts being transported.

According to the company, at the aircraft division of Packard Motor Car Co the same solution is being used to coat workers' shoes that are constantly exposed to cutting oils and solvents which are injurious to leather.



TYPICAL of the automatic high production machinery specially designed by Davis & Thompson engineers for countless varieties of war equipment, arms and munitions, this *Two-Spindle-Opposed Horizontal Boring Machine* is speeding production of vital parts at rates never before believed possible.

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DAVIS ROTOMATIC HIGH PRODUCTION MACHINERY

By JOHN D. KNOX
Steel Plant Editor

briquetting machine

Supplies Charge and Feed Ore in Cubes

LAST WEEK I walked through a machine shop in Cleveland where a half dozen or so men—all Americans—were engaged, and thence through a couple of small offices into a reception room fitted out with old-fashioned leather covered arm chairs. Here I engaged in conversation with C. M. Eberling and R. F. Mitten—men who like to take hold of problems others have abandoned and work them out to a logical and practical conclusion.

This shop has been running through "good times" and "bad times" for the past 30 years. Never during this period have any men paraded before its entrance carrying signs and banners of complaints or grievances for there never have been any strikes.

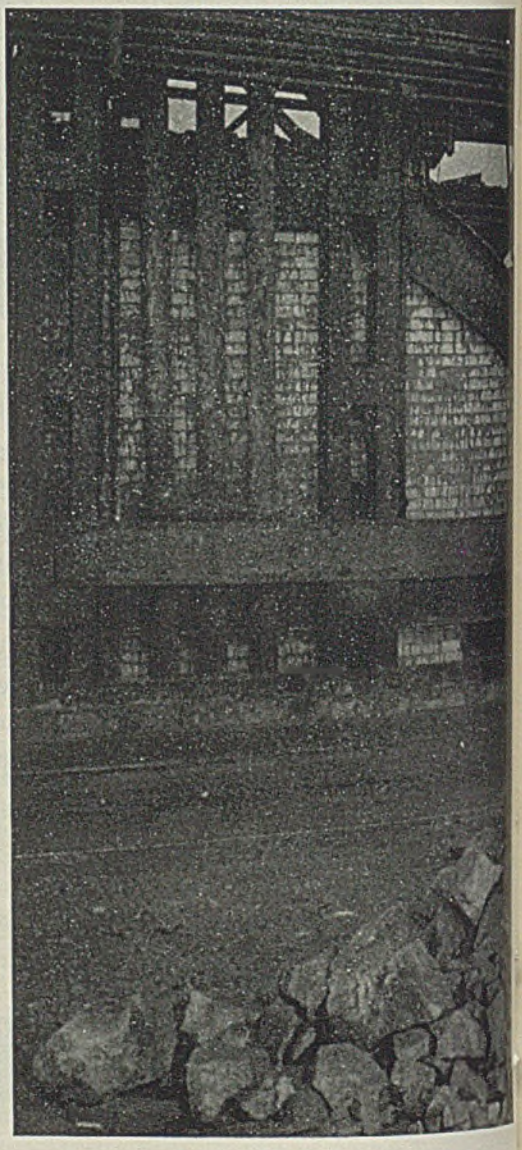
Many machines have come off the floor of this shop—machines for tying bags, for sorting and counting, feeding and mixing; machines that have cleared away many obstacles and allowed industry to proceed full speed ahead. For instance, about 12 years ago equipment was developed and made to convert excess coal screenings into packaged bricks and cubes. The production of cube-shaped briquettes of coal was not new but the idea of wrapping them in paper *was* new. The cube became the ideal type of briquette to wrap, inasmuch as six of them formed a strong unit when enclosed in paper and sealed with tape. Today there are about 90 plants operating from coast to coast in 13 states using the Eberling-type machine for briquetting coal screenings.

Two years ago the problem of briquetting chrome ore arose. Could it be done? Did the company have a machine which would handle a job of this character and stand up under the abrasive action of the aggregate to be compressed? Out came the drawing board, and in 28 days a machine and a mechanic to install it were on their way to the plant in question. Today five machines are compressing chrome ore in cubes and another machine is under construction. The machine for this job is 3 feet wide, 7 feet long and 4 feet high. Cubes of chrome ore, 3½ x 3½ x 3½ inches and weighing about 5 pounds, are being produced at the rate of 24 cubes per minute by each machine with a working force of two men per machine.

Because of the concern over the available supply of charge and feed ore for open-hearth operation every effort of the company is being made to place its briquetting press at the disposal of the steel industry in order to convert ore fines into a condition suitable for charging.

The supply of charge and feed ore in lump form is not adequate to meet current steelmaking requirements because of abnormal ingot output and the shutting off of supplies from mines in Sweden and Brazil. Consequently, the basic open-hearth steel industry is faced with the problem of finding a suitable supply of charge and feed ore not only for the thousand or so open hearths already making steel but for the new furnaces which are scheduled to be ready for operation in 1943. Already this is causing many a steelmaker to lift his eyebrows, for with the completion of the open-hearth expansion program in this country the various basic shops will be in a position to pour close to 100,000,000 tons of ingots annually. And with this amount of steel passing through pouring nozzles into molds there will have to be an available supply of charge ore of at least 10,000,000 tons.

If it were plausible to use fine ore as a charge ore there would be no reason for the open-hearth operator to be concerned. But there is not sufficient time to eliminate the moisture in the ore from the time it is charged until hot metal is



Charging side of a basic open-hearth furnace in which a heat is well on its way. Photo courtesy Carnegie-Illinois Steel Co.

added to the heat and at the same time maintain the normal rate of output. And unless the moisture is eliminated there will result sharp blowups, delay in tapping due to a chilling effect, and an unstable carbon range at which melting begins.

Only approximately 1,200,000 tons of lump charge and feed ore will be available for 1943 consumption. In some quarters it is felt that the shortage of suitable charge ore by 1944 will be in the neighborhood of 3,750,000 tons. A possible solution for equalizing this supply and demand lies in the briquetting of fine and moist ores into cubes suitable for open-hearth charging.

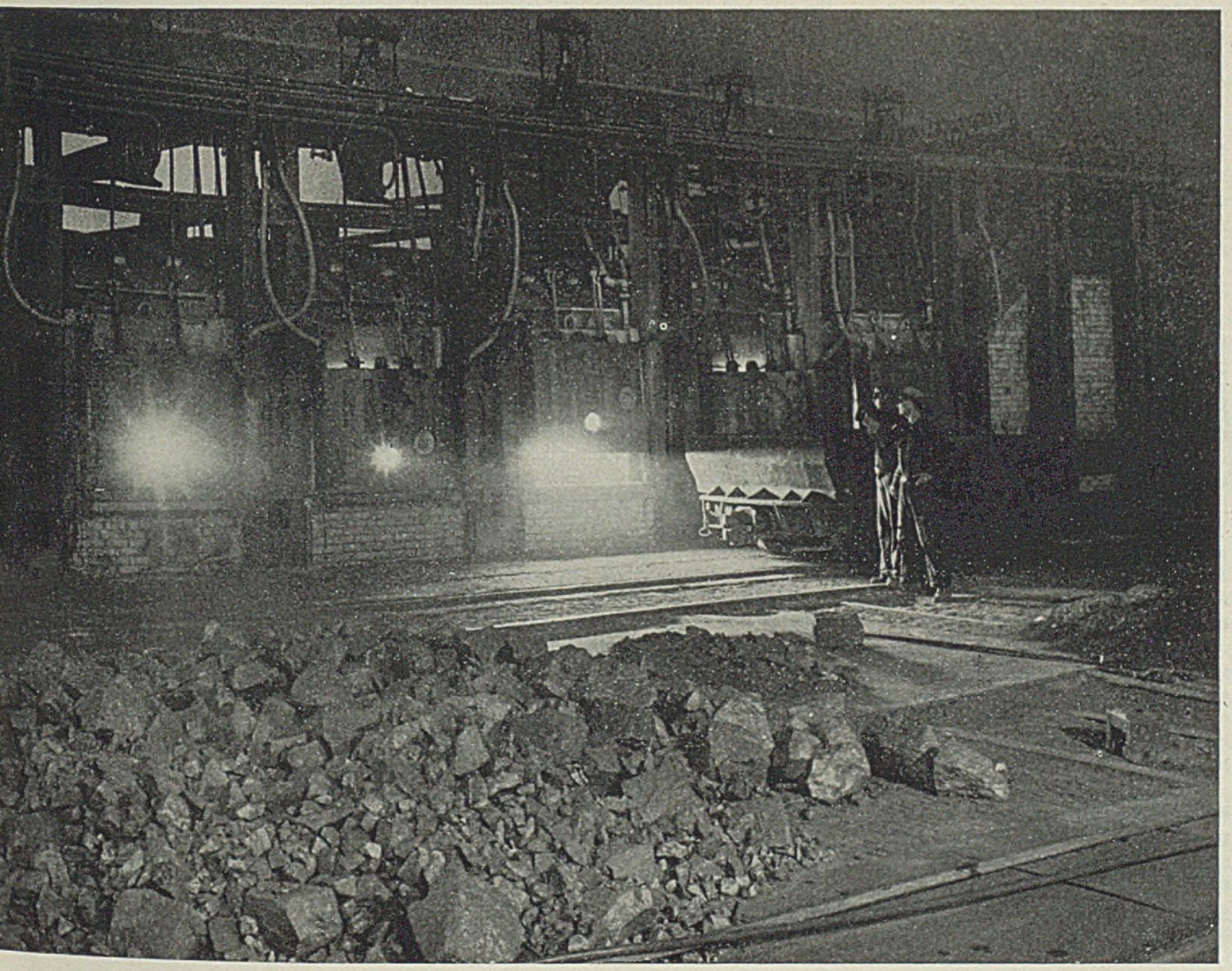
A machine designed and built by C. M. Eberling Co., 6002 Ellen avenue, Cleveland, for briquetting charge ore now is in operation at a plant in the Pittsburgh district. The unit is built with a power-driven batch mixer which operates in a hopper. The unit is mounted on 15-inch I-beams formed into a rugged box section and reinforced by cross members. This base is the foundation for all main bearings, and since all compression loads are absorbed within the base it is not necessary to anchor the machine to the floor.

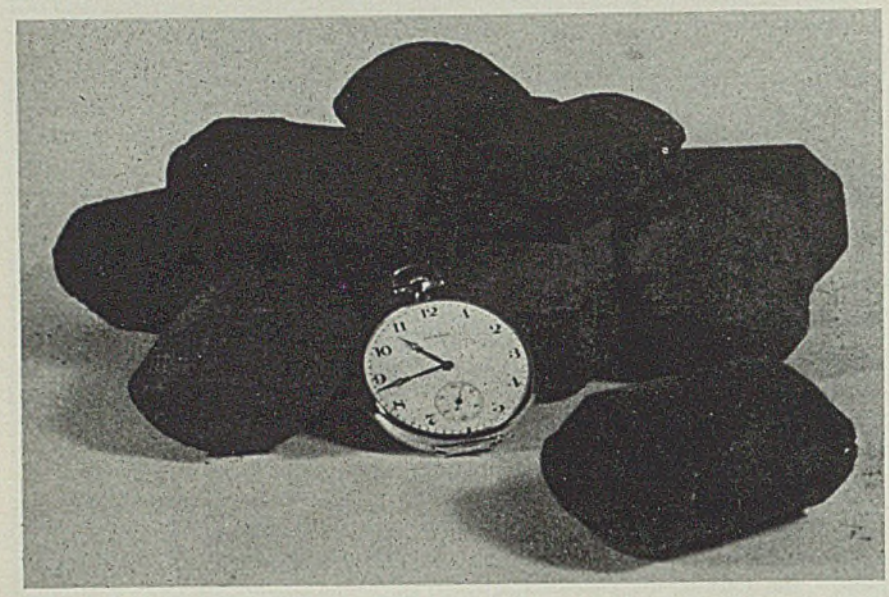
At the rear of the machine is a hopper for measuring the amount of ore for each batch. This hopper is filled by gravity from an overhead bin. After being measured the ore is discharged into a power-driven mixer where a binder and the desired moisture are added. Elevating one side of the mixer permits the material to pass into a large hopper which serves as a storage compartment. Beneath the front end of this storage bin is a measuring device and feeder box. Its bottom is made with four square openings, 4 x 4 inches in cross section, through which the charge drops into the compression chamber at the proper moment. The tops of the chambers are closed and pressure is exerted from beneath by pistons which are raised by a cam and lever arrangement. After the pressing operation the cubes are stripped upward out of the dies and moved upon a conveyor.

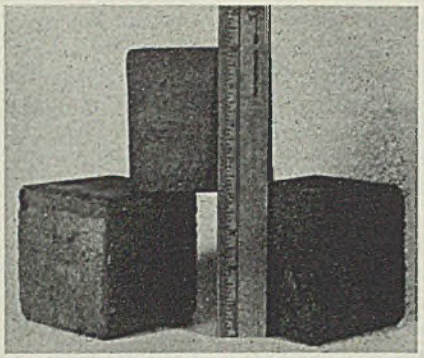
Approximately 2000 pounds per square inch is applied to the aggregate through the plungers which operate in the compression chambers. This has been found to be ample pressure and to exceed it invites crazing or cracking of the cubes after the pressure is released. Loose ore weighing 90 pounds per cubic foot is compressed by the machine to 180 pounds per cubic foot.

The feeder box mounted above the compression chambers and a control mechanism make possible the delivery of briquetted cubes which vary only a fraction of an ounce. The operator by watching a pressure gage can immediately notice any change in the weight of the cubes and correct it. Change in weight is attributed to the coarseness or fineness of the ore and the amount of its moisture.

Machines of this type are complete units, grease-packed when they leave the shop with the exception of the guides. An inbuilt 10-horsepower motor mounted on the base of the machine drives the entire mechanism through gearing. When







(Above) Briquettes of iron ore for charge and feed purposes in basic open-hearth practice

(Left) Briquettes of blast furnace flue dust which withstand normal charging conditions

operated as a single unit two men are required for the production of cubes and three men when two machines are operated side-by-side.

Each machine is built with multiple heavy coil springs which exert a pressure of 2000 pounds per square inch to cushion the heavy pressures used in compressing the ore fines into cubes. A special gage calibrated for each set of springs, indicates the pressure in thousands of pounds. Because of the heavy loads exerted special alloy bearings are used. These are deeply grooved to hold a reserve supply of high-pressure grease. All gears are made of steel alloy which resists abrasion.

Sketch 1 depicts the Eberling process of briquetting iron ore. Elevator *A* conveys screened iron ore to an elevated feed hopper, *B*, having a holding capacity of 60 tons. Ore, binder and moisture are measured and mixed in the batch hopper, *C*. The aggregate then passes to the press *D*, and is formed into 4 x 4 x 4-inch cubes by multiple dies at *E*. Cubes loaded on the conveyor *G* move into the baking oven *F* where they are held for a period of 4 hours at a temperature ranging from 120 to 140 degrees Fahr. After baking they are discharged upon the conveyor *H* which moves them to a stockpile.

The same flow of materials is depicted in Sketch 2 with this exception: Cubes ejected from the dies can be placed in open-hearth charging boxes and left to harden without baking or any further handling.

A briquette of fine or dusty red ores suitable for feed purposes in open-hearth practice must have sufficient size, weight and density to carry it through the blanket of slag into the bath of metal and at the same time to remain intact until it has fulfilled its function as a decarbonizer. If too small it will not penetrate the blanket of slag and no benefit will accrue from the usage; if too large it may lack density and disintegrate readily on its way through the slag. In other words, it must have the quality of withstanding initial high temperatures of the slag and the bath without breaking down too quickly. Repeated commercial tests of briquettes formed by the previously described machine show that they meet this qualification and that the conversion of the ore into briquette form is accomplished at a low capital investment.

The same type of briquettes also are used as charge ore. Commercial tests and actual practice show that they stand up under the charging operation and that when they come in contact with hot metal in the furnace there are no explosions or violent reactions. The binder used in making the briquettes adds no undesirable elements.

In making these commercial tests which began at one of the plants of a large steel producer last spring and still are being conducted, a cube-shaped briquette was adopted. Each cube, 4 x 4 x 4 inches, weighs between 6 and 7 pounds depending upon the grade of ore used and the critical pressures allowed. This shape and weight has been found to work satisfactorily for both feed and charge purposes.

In practice, the ore is first screened in sizes ranging from ¾ to 1½-inch mesh, depending upon the grade of ore. The screenings are batch mixed with a binder for three minutes and a small amount of moisture added to give the aggregate a tacky consistency. The aggregate then is fed into the dies, compressed and automatically ejected in cube form. The cubes are conveyed for a period of about four hours through an oven maintained at a temperature ranging from 120 to 140 degrees Fahr. The briquettes then are in a condition to withstand the usual amount of handling common to feed and charge ores.

It has been found that the proper screening, binder, mixing period and pressures are vital factors in the production of a satisfactory briquette. None can be overlooked. In the case of pressures, it is so easy to over and underpress the mixture. With some ores overpressure causes the cubes to crack when the pressure is released. This breaks the bond and defeats the purpose of briquetting. Other ores will stand a large amount of pressure.

In order to take care of these conditions the Eberling press is provided with an adjustment which can be made instantly while the machine is in operation. The presses are built in three sizes of varying capacity and can be used in multiple to provide flexibility in installation and operation. Based on present labor and material costs, the briquetting operation can be performed on this type machine at a cost of $1.00 to $1.50 per ton.

A test was made a few months ago to determine the ability of an ore briquetted in an Eberling machine to stand the high temperature without excessive spalling or dusting, as well as its workability. The briquettes were used as feed ore in an Ohio open hearth. The briquettes were made of sized fine ore screened through ½-inch mesh on ¼-inch mesh and through ¼-inch mesh. The ore has the following analysis:

Element	Per cent
Iron	53.50
Phosphorus	0.070
Silica	3.46
Manganese	0.58
Alumina	1.43
Calcium	0.21
Magnesium	0.23
Ignition loss	5.57
Moisture	11.78

A mixture composed of sized iron ore and the binder was made and com-

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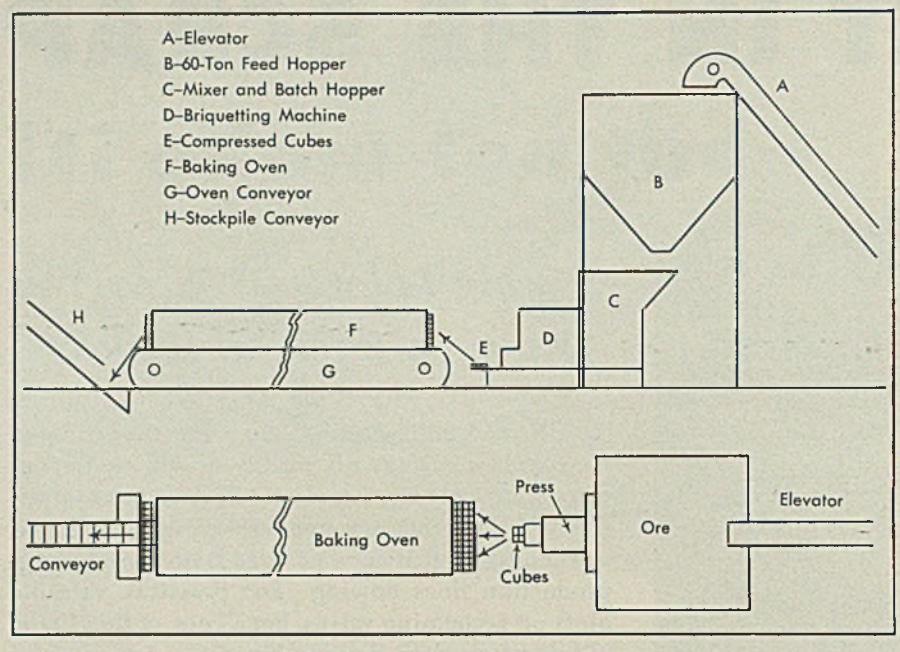


Sketch 1. (Upper)—Side elevation of plant for briquetting fine ores into cubes for open-hearth feed and charge purposes

Sketch 2—Plan view of Eberling briquetting plant for pressing open-hearth feed and charge ore into 4 x 4 x 4-inch cubes

pressed into 4 x 4 x 4½-inch briquettes weighing 6½ pounds each. Spalling and dusting tests were satisfactory.

The basic open-hearth heat was picked up at 0.54 per cent carbon with 4000 pounds of regular feed ore in the heat and a little lime down. After all the lime was up and about 300 pounds of fluorspar added, a carbon analysis showed 0.47 per cent. Briquetted ore addition amount to 2000 pounds.

The briquettes showed little spalling or dusting. They scattered well throughout the slag and exerted a fairly strong action. The action of the briquettes on the carbon elimination was somewhat masked by frequent doses of fluorspar, about 800 pounds having been fed to the heat after the briquettes were charged. Nevertheless, the carbon drop was fairly regular at 0.03 per cent carbon for each 5-minute interval.

The specification on which the heat was tapped and the preliminary and finished analyses were as follows:

	Analyses		
Element	Specification, per cent	Preliminary, per cent	Finished, per cent
Carbon	0.25-0.30	0.195	0.27
Manganese	0.80-0.90	0.11	0.94
Phosphorus	0.03	0.018	0.018
Sulphur	0.035	0.034	0.030
Silicon	0.15-0.17	....	0.23
Grain	5.8	....	....
Nickel	....	0.04	....
Copper	....	0.07	....

Slag: 11.27 per cent ferric oxide.

Other tests made by the company to determine the temperature at which a breakdown occurs shows that briquettes made entirely of a suitable binder and stone or gravel begin to fail around 700 degrees Fahr., whereas briquettes composed of iron ore and binder reach a temperature of 1500 degrees Fahr. before they are affected.

A continuous type machine recently was designed and built by the Eberling company for briquetting blast furnace flue dust for a plant which at the present time is obliged to ship about 50,000 tons of flue dust annually to a sintering plant over 100 miles away. The machine, 4 x 6 x 8 feet, manned by two operators will have a processing cost of 95 cents per ton of flue dust briquetted. When placed in operation at the plant where the flue dust originates, it is estimated that from 600 to 800 freight cars no longer will be required to move the raw dust elsewhere for sintering. At least $1.40 per ton will be saved by having a local briquetting plant available for operation.

Over-Tensioning Shortens V-Belt Life Tests Show

Evidence that life of Transmission belting and V-belts is influenced greatly by the tension factor, and that an increase in tension over that recommended will result in failure of the belt long before it should break down is revealed by data from a series of tests conducted under the supervision of George H. Stewart, belting engineer, B. F. Goodrich Co., Akron, O.

Three grades of present war-time transmission belting were used in that series of tests, which were run at 15 pounds per inch per ply, a 720-pound total for the tension, the recommended figure, and at 18 pounds per inch per ply, a total of 864 pounds tension, on 4-inch pulleys. Belts were all 6 inches wide, 30 feet in length, spliced in 10-foot endless lengths. Tests were all highly accelerated.

Belt No. 1 ran for 95 hours before breakdown while under the 18-pound tension, and increased its life to 230 hours before failure when the 15-pound tension was used.

Belt No. 2 ran for 88 hours at the 18-pound tension, and for 263 hours before failure at 15 pounds.

Belt No. 3 ran for 15 hours under 18-pound tension, and the service life before failure jumped to 48 hours under the 15-pound tension.

According to Engineer Stewart's report, an increase of 3 pounds per inch per ply over the recommended tension results in the belt giving only approximately one-third of its useful service life.

In giving these test results, Goodrich points out that because of the highly accelerated nature of the tests they are not an index to life in actual service, and were made only to obtain data on the ratio of tension to belt life. To have any direct evaluation to real service, tests should be made for much longer periods, the report discloses.

Offers Creams To Check Industrial Dermatitis

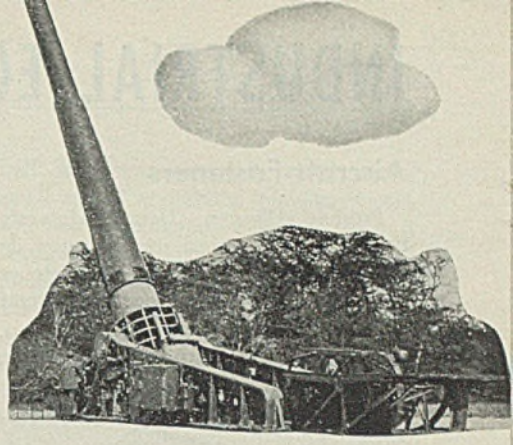
A line of industrial skin creams and lotions called Fend, for guarding against industrial dermatitis and keeping men and women on the job without loss of time and production, is being offered by Mine Safety Appliances Co., Braddock, Thomas and Meade streets, Pittsburgh. These are said to provide a protective barrier against skin diseases.

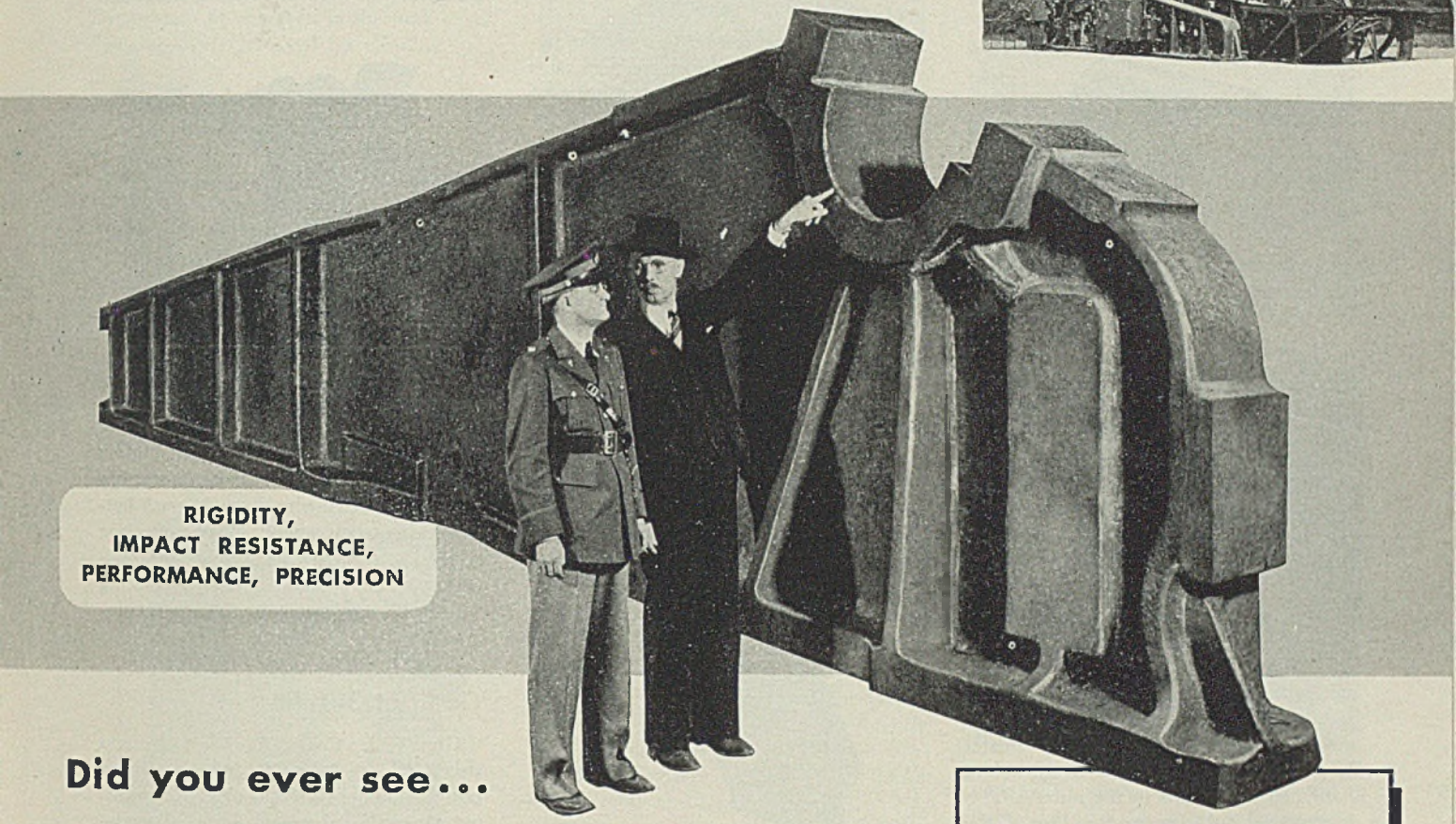
Consisting of cosmetically-safe materials, the creams are medically correct, easy to apply. Offering no interference with the normal action of the skin glands, they are readily removed with mild soap and warm water.

Develops Flux for Use in Gas Welding Magnesium

A new flux recently developed by Park Stewart, 1054 Carbis street, Worthington, Pa., is reported to be suitable for gas welding alloys of magnesium whether sheet or extrusions. Called Mag-Na-Flo, it is used by first mixing with water to form a thin paste, then painting it on the metal to be welded.

STEEL CASTINGS FOR THE BIG GUNS





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a gun big enough and powerful enough to throw a projectile weighing as much as a Ford sedan a distance of 30 miles?

That is the kind of guns we are building for coast defense. Gun, carriage and mechanism weigh as much as three-quarters of a million pounds.

It is certainly logical that they should build the supports for such heavy ordnance of steel castings.

Steel castings are rigid and strong enough to support tremendous weights, and to withstand tremendous shocks and impacts. They permit accurate assembly and precision adjustment. And they can be made and assembled quickly—a vital consideration in our race against time.

Whether the essential parts of your product are weighed in ounces or tons, chances are you can save time and money, and turn out a better product, if you also use more steel castings.

To learn more about this thoroughly practical way to secure all of the unquestioned advantages of steel as a material, consult your local foundryman, or write to Steel Founders' Society, 920 Midland Bldg., Cleveland. You incur no obligation by asking for information.

STEEL CASTINGS BRING YOU THESE 7 ADVANTAGES

1. *Uniform structure* for strength and shock resistance.
2. *Metal distributed* for strength with minimum weight.
3. *Wide* range of mechanical properties.
4. *Good machining qualities*—lower finishing costs, better appearance.
5. *High rigidity*, accurate alignment, minimum deflection, better fit.
6. *Readily weldable* in composite structures.
7. *High fatigue resistance*, longer life, ideal for critically stressed parts.

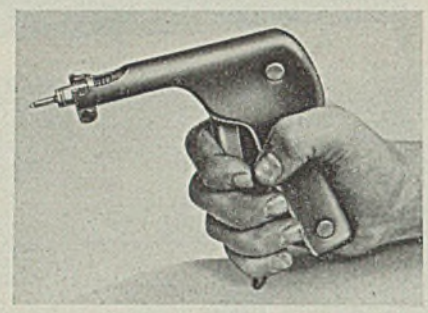
MODERNIZE AND IMPROVE YOUR PRODUCT WITH

STEEL CASTINGS

Aircraft Fasteners

Prestole Division, Detroit Harvester Co., Toledo, O., is offering two new developments—Prestite nut plate fasteners and a safety Champ gun for aircraft skin assembly.

The first, the nut plate fasteners, are

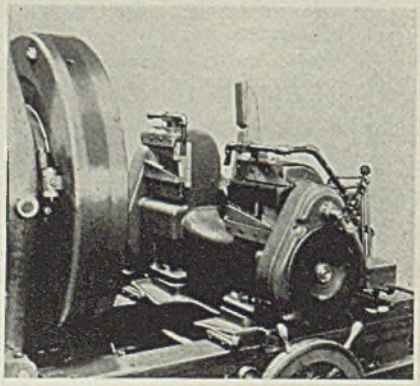


for holding nut plates temporarily while they are being riveted to aircraft sheets. The fasteners, are reported to save considerable time. A shoulder in the unit automatically locates the nut concentric with the clearance hole in the sheet. This permits the holes in the base of the nut plate to be used as a templet for drilling the rivet holes in the sheet if desired.

The gun is used for assembling prestite or other skin holders to aircraft sheets. Its light weight and balance is said to minimize fatigue, making it especially suitable for women workers. Also, its automatic gun-type grip provides greater leverage. A unique feature is the use of hardened steel chips in the muzzle. This is reported to increase the life of the gun many times.

Cutting-Off Unit

Landis Machine Co., Waynesboro, Pa., recently developed a hydraulically-controlled cutting-off unit which replaces



the standard carriage, crossrail, and die head of the Landis mill-type pipe-threading machines when used for cutting-off operations. The device comprises two high-speed steel cutting-off tools mounted in massive slides for maximum rigidity.

These tool slides function through a hydraulic cycle which provides rapid traverse of the tools to the work and rapid retract after the cutting-off operation is completed. A lever controls both forward and return movements of the tool slide.

Complete operator-control of the hydraulic cycle provides variable feed rates for the cutting-off tools and adjustment of the length of travel of these tools for different thicknesses of tubing. The adjustment for rate of feed is made through a control valve so that rate of feed, for both front and rear cutting-off tools will be the same. The cutting-off tool slides likewise are adjustable, within certain limits, for various diameters of tubing.

Naval Bronze Files

Nicholson File Co., Providence, R. I., announces a line of files for use on naval bronze. Teeth of files in the line are shaped so they will not dig into the

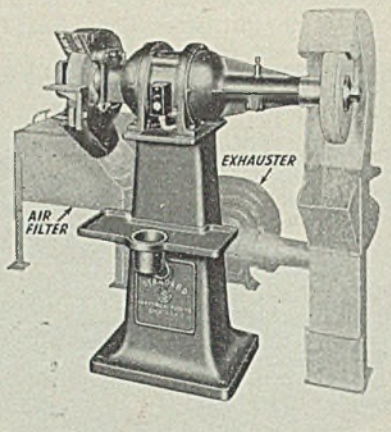
metal, resulting in a good finish, counteracting any tendency of the files to run off to one side. The teeth are said to be very sharp, retaining their sharpness even standing extra abuse. Files are being offered in all types and sizes as the regular purpose files.

Combination Grinding And Buffing Machine

Standard Electrical Tool Co., Department C, 2488, River road, Cincinnati, announces a new combination grinding and buffing machine which features an exhauster unit for removing and collecting grinding and buffing particles. It is being offered in 1, 2, 3 and 5-horsepower sizes.

Left side of the unit includes a safety hinge door emery wheel guard adjustable to wheel wear and fitted with adjustable spark breaker and work rest. The spindle is mounted in three heavy-duty ball bearings and the buffer is fully enclosed.

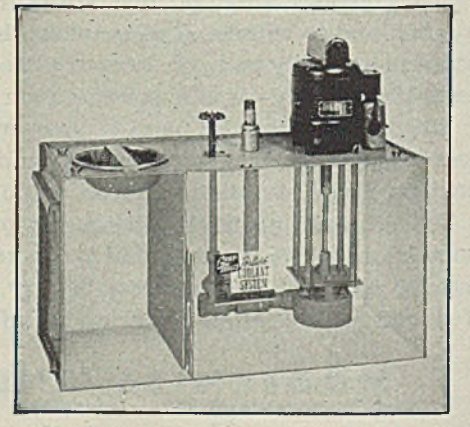
Tool tray and removable water pot are fitted to front of pedestal. The dust arrestor assembly includes material handling fan, blower, air filtering stand and



adjustable exhaust hood for buffing wheel. The machine and fan motor operate simultaneously through push-button starting equipment. Dust collecting system is available separately for application to any type of grinding, buffing and polishing equipment and is produced in three sizes.

Coolant System

Gray-Mills Co., 213 West Ontario street, Chicago, now is offering a new portable model G-10A coolant system using a centrifugal pump, designed to deliver controlled coolant flow from 10 to 1000 gallons per hour. It provides large coolant volume and high flushing capacity, making it particularly applicable for multiple spindle and deep drilling work, drill press installations, large cut-



off machines, grinder, milling machines, turret lathes, and as a stand-by unit for central systems.

The centrifugal pump is a high stress casting, with sleeve bearings. Intake

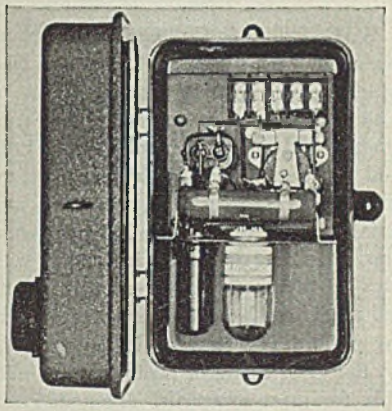
orifice is 1¼ inches; discharge 1 inch. Both 1 and 3-phase ¼-horsepower motors, 110/220 or 220/440 volts respectively, are available.

The tank of the system, of 40-gallon capacity, is 16 inches deep, 16 inches wide, and 36 inches long. A double baffle plate provides forced settling, and a separate filter screen in the tank cover can be easily removed for cleaning.

Photoelectric Controls

Photoswitch Inc., 19 Chestnut street, Cambridge, Mass., is introducing on the market an improved series of type A15 photoelectric controls. Latest engineering developments embodied in these units include relay contacts to handle heavier loads directly, conservatively ly rated at 10 amperes alternating current at 115 volts.

The output terminals are those of a single-pole double-throw switch, for either normally closed or normally open



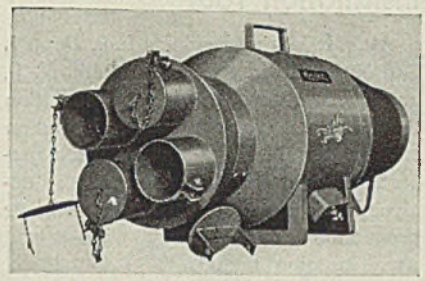
operation. This promotes action either when the light beam is broken or when it is made.

Operating range of this series is 20 feet with light source L30, and 40 feet with light source L60. Units in the series provide efficient operation for such applications as counting, conveyor control, machinery safeguards, signal and alarm systems, motor or valve control, inspection and break detection.

Exhauster

Chelsea Fan & Blower Co. Inc., 1206 Grove street, Irvington, N. J., is offering to war plants a new portable Octopus Jr. exhauster developed to eliminate gases, fumes, etc. from closed-in places, such as shipholds, welding rooms, tunnels, vaults and basements.

Powered by a ¾-horsepower ball-bearing motor, the unit sucks or blows at the rate of 2000 cubic feet per minute and operates in any position. It is equipped with adapters for three 4-inch nozzles or four 3-inch nozzles for flexible hose. Caps are included to close nozzles not in use. Each 4-inch metal



hose of 20-foot length will exhaust 250 cubic feet per minute and each 3-inch hose, over 200 cubic feet per minute. Entire unit can be hung in a small manhole.

Portable Floodlights

Steber Mfg. Co., 2451 North Sacramento avenue, Chicago, is offering new larger model Circulite floodlights for use in illuminating airports, emergency fields, hangars, shipyards, shipways, loading and unloading areas, railroad yards, factory grounds as well as providing emergency lighting for night construction or repair work.

Being portable, they may be placed anywhere, mounted on floor, or directly on truck or other vehicle. Models supplied with casters are particularly useful in assembly and repair shops.

Identified as the 1630 series, the floodlights employ 300-500 watt lamps, are adjustable to any angle, vertical or horizon-

tal. They are equipped with 12-inch chromium plated reflector and 20 feet of cord.

Cleaning Machine

L & R Mfg. Co., Newark, N. J., is placing on the market a new heavy-duty precision cleaning machine for cleaning ball bearings, extruded metal parts, small motor assemblies, pinions, jewels, watches, diaphragms, cylinders, etc. It features two baskets, one, the large maximum volume capacity unit measuring 2⅝ inches inside diameter by 2¼ inches deep—the other a triple basket arrangement consisting of a retaining frame which holds three individual small baskets each measuring 1⅞ x 1¾ inches deep.

In addition, under each of the triple baskets is a sub-basket, 2⅛ inches long by 1⅛ inches wide. The mesh of these units is divided into two cups ⅞ inches wide by ⅜ inches deep each. Cleaning, according to the company, is a matter of a few minutes. The unit is a portable machine easily transferrable from place to place. Its weight is

under 50 pounds. The area occupied is only 13 x 15 x 18 inches overall height.

When the work basket is loaded with parts, it is snapped on the motor shaft of the machine and lowered into the first jar containing power Nofome cleaning solution. The basket is agitated centrifugally, rheostat controlled, and speed may be stepped up to 1000 revolutions per minute.

Unusual feature of the unit is the controlled reversing action. By pressing the red button just above the rheostat knob, the action of the basket may be switched from clockwise to counterclockwise motion. More effective agitation is produced.

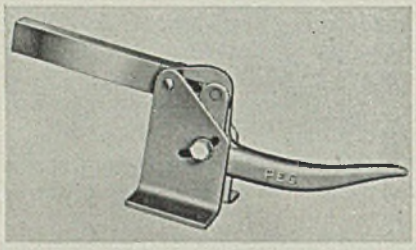
After running in the power Nofome, the basket is lifted above the solution level in the jar and revolved to throw off excess fluid. This keeps the rinse in the second jar cleaner. The Nofome is soluble in the rinse which also thoroughly cleanses the parts. The operational procedure is the same as in the first jar.

The third jar contains the same rinse as the second and acts as a final degreaser and polishing agent. Drying is accomplished in the fourth chamber

which is equipped with a Chromalox heater unit through which a motor-driven blower sends hot blasts of air into the parts revolving in the basket.

Jig Clamps

Products Engineering Corp., 700 East Florence avenue, Los Angeles, is offering a new line of self-adjusting jig clamps that can be locked in infinite

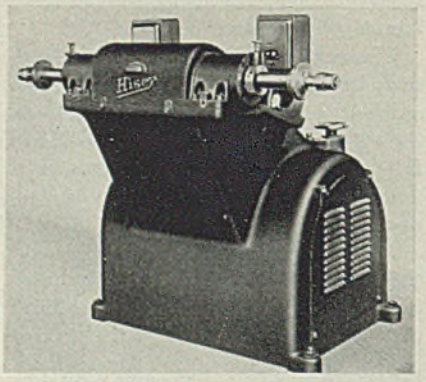


positions up to 15 degrees above or below horizontal. A slotted aperture, that functions much like that found on a pair of pliers, makes the infinite adjustment possible. Besides the self-adjusting feature, each drop-forged clamp has a positive lock and is quick-acting.

Polisher and Buffer

Hisey-Wolf Machine Co., Cincinnati, announces a new heavy-duty polisher and buffer which features an internally-mounted motor. It is being offered in a single-spindle—single-motor type, as well as two-spindle—two-motor style, with motors from 3 to 10-horsepower capacity.

According to the company, mounting the motor inside the base permits use



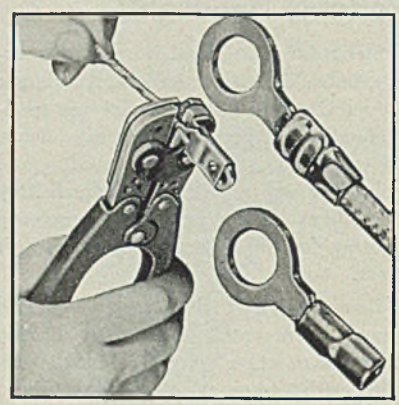
of standard open motors in place of totally enclosed, fancooled motors, and a corresponding saving in scarce materials.

Oil lubrication with minimum attention is a feature of the constant level type oilers. While illustration shows "open" type spindles, encased type also can be furnished with a housing about the spindle extension with a ball bearing directly adjacent to the wheel.

Installation Tool

Aircraft-Marine Products Inc., Dept. J, 286 North Broad street, Elizabeth, N. J., announces a new "hand-die" installation tool for use with solderless insulation support terminals. Affecting three perfect crimps at one time, the tool is so designed that unskilled workers can achieve production line efficiency without the usual training period.

An insertion gage automatically positions the terminal; the crimping jaws for both wire and insulation are in reality dies of tool steel adjustable to accommodate various insulation and wire diameters. Fifteen to one leverage on the "self-opening" handles facilitates opera-



tion. When the jaws are closed tightly a perfectly crimped connection has been made. Army and Navy wire sizes are marked clearly on the tool which may be made quickly left or right handed as needed.

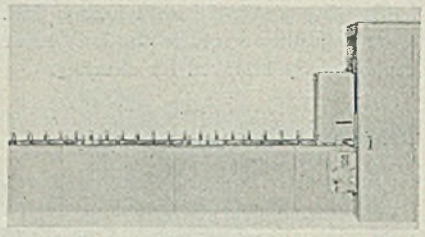
Coating Equipment

DeVilbiss Co., Toledo, O., announces a new line of high-speed, automatic shell coating equipment for wide adaptability in finishing operations in automatically painting bombs, shell, shot, grenades and cartridge cases of all kinds, in sizes ranging from 20 to 155 millimeter. Some types spray exteriors only, while others paint both inside and out, depending upon job requirements.

The outfits handle with equal facility all finishing and coating materials commonly specified for ammunition.

Every unit, though basically similar, is engineered specifically to do a particular job. Spraying stations are located at one or both ends of the conveyor.

On one type, three stationary automatic spray guns are actuated only when each shell moves within spraying range. Another outfit employs two guns—one for inside and one for outside spraying. Both are moved horizontally and vertically automatically with the shell. A third hook-up for shell having an inside adapter has a

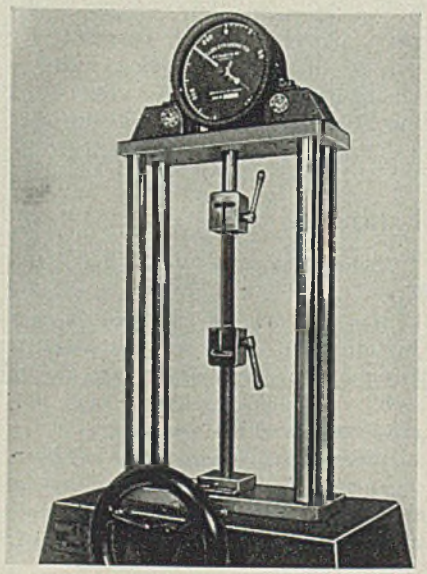


spray gun with a hook-type extension. This and another moving extension gun coats all interior surfaces while a third moving gun paints the outside.

Conveyor length is determined by drying and handling requirements of each job and either dry or water wash exhaust is furnished as desired.

Tensile Testing Machine

W. C. Dillon & Co., Chicago, is offering a new model tensile testing machine which takes material within limits of 0 to 10,000 pounds, and up to a foot in length, and proportionately wide. It is said to determine elastic limit, stress, strain, stiffness, plasticity, resilience, material strength, etc., on the AN dynamometer 5½-inch diameter indicator, with plus or minus 2 per cent accuracy; its red maximum hand disclosing the breaking point. The tester is loaded manually, the grips being of standard type suitable for most materials. The unit is 32 inches high. It has a base width of 19 inches. The distance between its platens is 18 inches. Maximum jaw opening is 13 inches and width between posts 9 inches.



Prewar Development Saves Critical Metals

Use of carrier-current equipment developed by General Electric Co., Schenectady, N. Y., prior to the war is making possible a reduction of 85 per cent in the amount of copper used in systems to control outdoor and obstruction lighting, and other electrical apparatus at three military bases.

Equipment used at the military bases is similar to that used by many electric power stations to control street lights and water heaters. It transmits impulses over the regular power lines, these being picked up by receivers which in turn operate relays to turn on or off the current flowing to electric lights, pumps, and other electrical apparatus.

Use of the equipment at the bases eliminated the necessity of running miles of separate lines of copper cable to control the various necessary electrical circuits.

DO'S AND DON'TS ON CORRECT BROACH USE

Because of the increased rate of tool breakage caused by both heavy war production schedules and influx of untrained labor, Harry Gotberg, chief engineer, Colonial Broach Co., Detroit, prepared the following "do's and don'ts on correct broach use" to help conserve these production "battle weapons" as much as possible. His suggestions are as follows:

Treat a broach as carefully as you would any other precision cutting tool.

Don't expect a broach to correct excessive eccentricity due to inaccurate previous machining. Best practice is to use the broached hole as the "locating point" for subsequent outside diameter turning or facing operations where close concentricity must be obtained.

Always check the suitability of a broach for the specific job. The material, length of broached hole, broaching speed, broaching fixture and type of broaching machine all affect satisfactory broach performance.

Never permit cutting teeth of a broach to come into contact with a hard metal edge or surface since broach teeth are generally extremely hard and may be damaged.

Always transport broaches carefully to avoid striking teeth against any metal surface. Preferably transport and store them in specially designed tote boxes or bins fitted with wood or other soft materials where contact with the broaches takes place.

Grind only enough metal from *each tooth* of a broach to bring it to required sharpness. Grinding away more than necessary amount on each tooth shortens life. Only a few special broaches require same amount of metal be removed from all teeth.

Use adequate equipment, designed especially for broaches when sharpening them. Broach life is materially shortened if correct tooth form is not maintained and broach is not held properly in the sharpening machine.

Use right type of grinding wheel when sharpening broaches. Wheel size, grain and grade are important in obtaining sharp cutting edges without burning metal.

Before deciding on any broaching set-up, make sure the broaching machine is of adequate capacity for the specific job to be performed. Broaching speed and smoothness of operation not only affect the broaching time, but also quality of the work done.

In making any broaching set-up, check alignment of the puller and guide bars (if used) with the centerline of the face-plate or plates before mounting fixture.

In hole, spline and keyway broaching operations, check alignment of fixture with centerline of broach, puller and guides before starting operations.

In helical spline broaching, keep backlash and wear of broach drive head and lead bar at a minimum. It is difficult to maintain close limits on helix angles, if excessive wear exists.

Design broaching fixture or face plate adapter used in round or spline broaching for as small a clearance as possible without making it too difficult to insert and remove piece to be broached.

In all surface broaching operations, make sure fixture is sufficiently rigid to prevent movement of piece.

Design holding clamps which retain the piece in the fixture so piece cannot slip during broaching operation, even if an unusually heavy load is encountered, such as one due to additional metal in a forging or casting, a hard spot, etc.

When broaching from a cored hole in a casting or a forged hole it is preferable to use an equalizing fixture to avoid excessive eccentricity of the load on the broach.

Make sure when broaching from drilled holes, that the hole is square with the face of the piece which contacts the fixture.

Design all indexing mechanisms so no backlash can occur while a piece is being broached.

Always complete broach pass and remove piece before reversing machine and returning broach to initial position.

Before starting broach pass, make sure the piece is firmly and fully seated in the fixture. Slippage or "jumping" of piece during the pass may break the teeth (surface broaching) or break it in two (hole broaching).

If a broach becomes stuck in the work (due to failure of power supply, etc.) never reverse machine or try to push broach out backwards (against its normal cutting direction).

Tooth breakage is almost certain to occur if this is done.

Should piece become stuck on the broach (internal or hole broaching), remove piece from broach by one of the following methods, after first carefully *removing both stuck piece and the broach from the machine.*

(1) Gently tap piece evenly and slide it off the starting end of broach. If piece cannot easily be removed by this method, then (2) Place stuck piece and broach in a lathe and turn the piece from the broach, or (3) The piece may be sawed in two with a hack saw and thus freed of the broach. (4) A combination of methods (2) and (3) may sometimes reduce time required to free the piece.

In surface broaching, if the broach becomes stuck before the pass is completed, proceed as follows:

(1) Loosen piece in the fixture by unclamping it, if a non-retracting table or fixture is used. Then loosen fixture and withdraw it from the broach. (2) If broaching machine has a receding table, carefully retract broach table. Only the lightest force should be used while doing this. (3) Check broach, fixture and table to make sure that no broken parts of the piece will catch between fixture and broach when the broach is returned to starting position.

Steel Switchgear

(*Concluded from Page 57*)

ricating operations. From the form in which the steel is received, it is sheared or cut into sheets, angles and channels to required lengths as shown in Fig. 2. Framework steel then undergoes punching, drilling, tapping and matching operations. Structural-type steel members such as angle sections are passed through special grit-blasting machines. Fig. 3 shows a typical unit. All rust and scale are removed here.

Special hydraulic benders like that in Fig. 4 facilitate bending up the angle sections for the panel frames.

Most of the punching operations are done with large turret-type presses such as the one in Fig. 5. Standardization of parts lowers the number of dies that must be carried on the turret to handle all types and sizes of meter openings, etc. Sheets are for the most part bent on large brakes. Fig. 6 shows a heavy sheet of steel being formed for a section of switchgear housing.

Whether parts are to be welded or bolted together depends upon the functional requirements of the unit. Most permanent combinations of parts are arc welded or spot welded together. After welding or bolting, parts need only to be degreased and painted and they are ready for the final assembly.

The compact design of steel switchgear allows shorter cable interconnections, and heavy copper disconnecting switches are eliminated. Thus copper requirements are reduced to one-fourth the amount required for open-type assemblies. This saving is almost entirely within the equipment itself; an added copper saving is made possible in the application of metal-enclosed units to load center distribution.

Machinist Mates

(*Continued from Page 59*)

are variations in colors and styles, for each girl likes to get her hair done in whatever way she chooses. On the whole, feminine costumes in our plant conform to a general type practical for the work performed.

The machine tool industry as well as others must prepare for employing women in rather large numbers before this war emergency is over. On the basis of our experience, I believe those companies that still have this transition before them may be agreeably surprised. Women appear far more attentive to their jobs than most men. The girls take their work seriously. When you walk out through the plant, you will see that the girls have their eyes on their work. They are not looking around the shop; they are not grumbling about this or that. They are frequently ask-

ing for suggestions as to how they can do their work better, and we are getting some extremely valuable ideas from some of the women in our plant.

For instance, to save floor space, our lathes are placed close together with work boxes at one end of the lathe. This meant that the operator had to step from the normal working position in front of the lathe to the end of the lathe in the course of the loading and unloading operation.

After one of our girls had been operating a lathe for several days, she asked the foreman if she could please have a little stand on each side of her so she could operate the machine without taking a single unnecessary step. Here was an example of a woman's applying in the plant exactly the same work-saving principles she had learned in her kitchen. Every woman learns how to save steps in the kitchen. A man might not think about it, but a woman thinks about saving steps. The result is increased output.

There are two things that must be emphasized. Don't wait till the last minute before making preparations to employ women. There are two vital advance steps which must be made. The first has to do with toilets and rest room facilities. Entirely aside from obvious practical considerations, most states have laws dealing with toilets and rest room facilities for women. If you are going to employ women, you must install in advance the necessary plumbing and the necessary rest rooms.

To get these things in time, you must put in your orders in advance, using your priorities to obtain the supplies you need. *You can't do this at the last minute. Remember, it takes time to get deliveries.*

The other point is that you must have a woman in your organization—a reasonably mature and experienced woman, and one capable of handling women's problems. She must be on the job ahead of time so when you start to employ women they will have a woman supervisor who will understand from personal experience the nature of the work to be done and the questions which will arise from the feminine viewpoint.

This means it is necessary to obtain a woman of this type far in advance of the actual employment of large numbers of women. She should be brought in early, put through a course of training, given an opportunity to become familiar with the various operations involved and made to understand that she is to function in the capacity of what you might call the "dean of women" for your organization.

She will not be the boss—the foremen and the superintendents are the bosses. But she is the person to whom women can bring any questions dealing with the woman's side of the picture, and she is the person to whom the girls can talk frankly as one woman to another.

Nothing could be more disastrous than the situation of a company which publishes an advertisement asking for women to apply for employment, and then when the girls come swarming in discover that it has neither adequate toilet nor rest room facilities, nor a woman supervisor capable of handling the women's side of the picture.

Let me urge you, therefore, to take steps immediately with respect to these two points—first, the providing of adequate toilet and rest room facilities; second, the employment and training of a woman who will be in a position to act as the supervisor of women on the day when the rank and file of women employes start lining up at the employment office.

It would not amaze me if the machine tool industry stepped out in the front line in this matter of employing women, because it is largely due to the accomplishments of the machine tool industry that women can be employed successfully in war production. Machine tool development and design now have the machine tool do much of the physical work formerly done by the operator. The machine tool supplies the precision and the power needed—the operator need furnish only the intelligence and the dexterity to operate it. No longer does it take muscle to be a machine tool operator, but rather a certain type of craftsmanship which the younger generation has shown it possesses in a high degree.

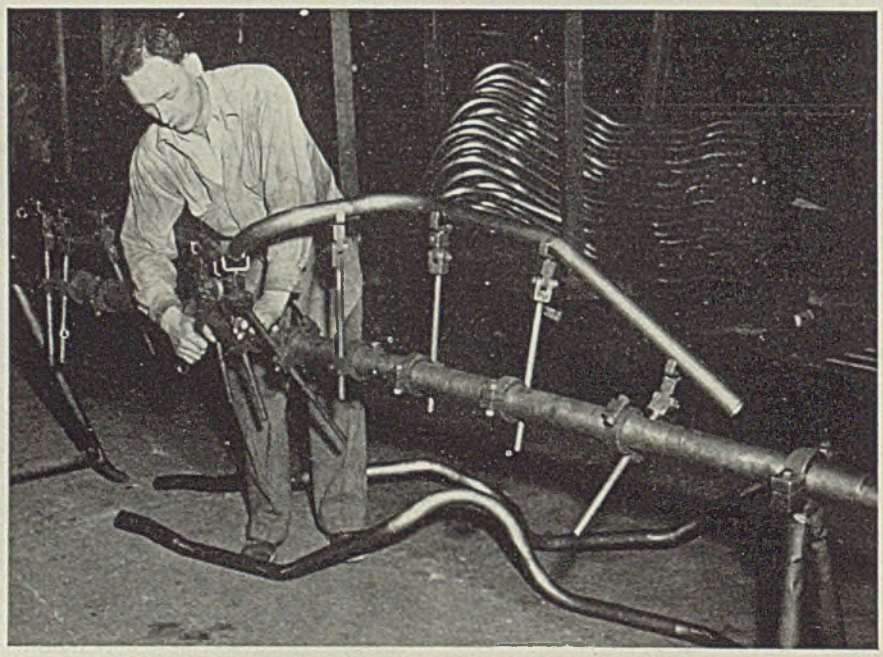
Not so long ago, we wondered what would be the effect on morale if we brought women into the shop. I can say without any reservation that so far as our own plant is concerned, the net result has been a definite stepping up in morale throughout the entire organization.

It's heart lifting to go into our plant and see the people working there, turning out the lathes that Uncle Sam must have to win this war. There working side by side are handsome girls and women, strapping young men, older women, men of middle age—all plowing ahead to get the job done.

There is a sort of comraderie that develops from this mingling of the sexes in the plant which we never used to have when we had all men.

What develops from this situation is a realization that *everybody*—not just men, not just husbands, sons and fathers, but women, too, sweethearts, wives and daughters—*everybody* must get out and work hard to turn out what it takes to win this war.

NO PLUMBER'S NIGHTMARE THIS—JUST A JIG



CONSIDERABLE storage area for templets was eliminated by this complicated-looking jig rigged up by American Welding & Mfg. Co., Warren, O., to serve as a master templet for even the most "curvacious" exhaust pipe. It consists of a 12-foot heavy steel pipe secured horizontally between two V-shaped standards. At intervals along the pipe are movable, adjustable collars from which extend arms with swivel clamps that can be turned in any direction. With a wrench, one can set up any combination of these arms to duplicate specifications for any exhaust unit

Shift in War Requirements; To Double Munitions Output

PRP distribution reflects change. . . CMP allotments to take over in second quarter. . . Bars still tightest product in steel. . . Heavy sheets in strong demand

DEMAND
Heavy for war use.

PRODUCTION
Steady at 97½ per cent.

PRICES
Ceilings hold steady.

CHANGED emphasis on production of various types of war goods is reflected in ratings and allotments on Production Requirements Plan certificates for first quarter.

Developments in the war and quantity of war materiel accumulated last year have influenced this trend and in a general way it means greater emphasis on output of offensive weapons and less on defensive types.

Controlled Materials Plan has no effect on PRP procedure for first quarter but is scheduled to take over distribution from PRP in second quarter. It is not expected that this change can be made completely at the beginning of that period. While CMP allotments will be issued as rapidly as possible consumers who do not receive authorization sufficiently early under the new plan will be permitted to make second quarter purchases under authority of PRP first quarter certificates, with adjustments when CMP certificates are received. Orders with allotment numbers will take preference over PRP orders and all priorities. All other distribution plans will terminate July 1 when CMP will cover the entire situation, dividing total steel production among essential consumers in proportion to urgency.

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Extent of the requirements for steel in 1943 is indicated in a statement from the War Production Board, the Army and the Navy that munitions production will be double that of 1942. This includes aircraft, merchant vessels and naval escort and combat vessels. To meet these requirements some reduction is planned in tanks, artillery, motor vehicles and ammunition. The entire production picture is fitted into a master program based on available material and manpower.

Some consumers have requested that part of their tonnage be deferred until second quarter as their first quarter PRP quotas do not cover their contracts. Delay in receiving quotas caused consumers to place orders to cover estimated requirements only to find they were allowed less tonnage. This condition was less marked than at the beginning of fourth quarter.

Steel bars, both carbon and alloy, continue the tightest spot in the matter of delivery, especially in large diameters and large flats. While small bars with high priority can be bought for six weeks delivery large sections extend well into second quarter. Cold-drawn bars are available in three to four months and alloy bars as far ahead as 35 weeks.

Sheet mills are receiving cancellations of tonnage on books, especially in lighter gages, as consumers find delivery unlikely in the face of preponderant demand for heavier gages rolled on continuous mills. Deliveries on hot-rolled sheets are about 60 days, with cold-rolled slightly longer and galvanized up to three months.

Steel production last week was at 97½ per cent of capacity, the same rate as prevailed the preceding period when flood conditions along the Ohio river and in eastern Pennsylvania caused a revision of the rate from that estimated in the issue of Jan. 4. Normal conditions were restored during last week and the rate will advance this week. Pittsburgh advanced 2½ points from the preceding week, to 98½ per cent, Cleveland ½-point to 93, Buffalo 2½ points to 93, Detroit 3 points to 92 and eastern Pennsylvania 4 points from the revised rate, to 95 per cent. Chicago declined 2 points to 100 per cent, on account of furnace repairs and Cincinnati lost 15 points to 73 on account of high water. Rates were unchanged at Wheeling, 70 per cent; St. Louis, 93; New England, 100; Birmingham, 95; Youngstown, 97.

Steel ingot production in 1942 exceeded all former records, total for the year being 86,092,209 net tons. Fourth quarter and last half output set new records for those periods. December production was 7,303,179 tons, higher than November but fourth for the year, having been exceeded in March, May and October. The industry averaged 96.9 per cent of capacity through the year.

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Machine shop work on war materials is producing an undue proportion of turnings and in some areas the supply is larger than can be absorbed and is backing up in the hands of dealers or producers. As a result prices have been cut $1 to $2 below ceilings in the effort to move them. Alloy turnings are a problem as it is difficult to assure analysis and melters fear to accept them without knowledge of the alloy content. General scrap supply is better than had been expected but the threat remains of shortages in the late winter. St. Louis consumers complain of tonnage normally coming to them bypassing to Ohio river points, and the situation there is far from comfortable.

Office of Price Administration has carried prices over into 1943 without change and composite prices are maintained at previous levels. Finished steel composite is $56.73, semifinished steel $36, steelmaking pig iron $23.05 and steelmaking scrap $19.17.

COMPOSITE MARKET AVERAGES

	Jan. 9	Jan. 2	Dec. 26	One Month Ago Dec., 1942	Three Months Ago Oct., 1942	One Year Ago Jan., 1942	Five Years Ago Jan., 1938
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	22.92
Steelmaking Scrap	19.17	19.17	19.17	19.17	19.17	19.17	14.10

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

	Jan. 9, 1943	Dec. 1942	Oct. 1942	Jan. 1942
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 9/32-inch, Pittsburgh	2.00	2.00	2.00	2.00

Pig Iron

	Jan. 9, 1943	Dec. 1942	Oct. 1942	Jan. 1942
Bessemer, del. Pittsburgh	$25.19	$25.19	$25.19	$25.19
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	18.75
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	20.00

Coke

Connellsville, furnace, ovens	$6.00	$6.00	$6.00	$6.20
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. Federal tax on freight charges, effective Dec. 1, 1942, not included in following prices.

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
		(.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; 0.50 electric.

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	18¼
1-3	68½	57½	2	37½	18

Lap Weld

In.	Steel Blk.	Steel Galv.	In.	Iron Blk.	Iron Galv.
2	61	49½	1¼	23	3½
2½-3	64	52½	1½	28½	10
3½-6	66	54½	2	30½	12
7-8	65	52½	2½, 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
2½"	12	16.01	18.45	15.16	.....
2¾"	12	17.54	20.21	16.58	26.57
2¾"	12	18.59	21.42	17.54	29.00
3"	12	19.30	22.48	18.35	31.39
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
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

½ x 6 and smaller	65½ off
Do., ⅝ and ⅝ x 6-in. and shorter	63½ off
Do., ¾ to 1 x 6-in. and shorter	61 off
1⅛ and larger, all lengths	59 off
All diameters, over 6-in. long	59 off
Tire bolts	50 off
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

Semifinished hex.	U.S.S.	S.A.E.
⅜-inch and less	62	64
⅞-1-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. 19, 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. Federal tax on freight charges, effective Dec. 1, 1942, not included in following prices.

	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.	27.63	.....	.....	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	24.00	25.00	24.50
St. Paul, del.	26.76	26.26	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	9.01- 9.50	$35.50
7.01-7.50	31.50	9.51-10.00	36.50
7.51-8.00	32.50	10.01-10.50	37.50
8.01-8.50	33.50	10.51-11.00	38.50
8.51-9.00	34.50	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	....	6.10	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	4.60	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; 1 to 99, 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	.15-.25	.75	15.00	1.25	25.00
NE 8720	.18-.18	.70- .90	.20-.35	.40-.60	.40-.70	.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-.50	.08-.15	.80	16.00	1.30	26.00
NE 9442	.40-.45	1.00-1.30	.40-.60	.20-.40	.20-.50	.08-.15	.85	17.00	1.35	27.00
NE 9537	.35-.40	1.20-1.50	.40-.60	.40-.60	.40-.70	.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 94

Leading sheet sellers declare it would not require a great deal of business to be an improvement over the volume of the past week or so. Despite the fact that the movement of tonnage was fairly well sustained new orders were light.

Receipt of PRP quotas for first quarter loosened some buying, but whatever influence these quotas may have, buying so far has not increased materially as a result.

Meanwhile there have been some actual suspensions, even recently, where consumers belatedly realized that they had more tonnage on order than their fourth quarter quotas actually permitted. In at least one or two cases tonnage had actually been shipped to consumers who meanwhile discovered they were not permitted to take it in, despite appeals to Washington. This has meant substantial demurrage charges even though the amounts did not involve more than a car or so.

Sheet mills in the Chicago area have received heavy cancellations, especially on lighter gages. Larger mills there have congested schedules and customers are turning to smaller producers for better deliveries. Demand for heavier gages from continuous mills is so great that larger interests are unable to take on any lighter material.

Many sellers, despite the recent lull, believed due in part to holiday influences, assert delivery promises are no better. Apparently, they point out, their mills are receiving more sustained volume from other quarters, probably including some substantial directives from Washington.

Orders for narrow cold strip are heavier, well in excess of shipments with most producers. While some of this tonnage is for second quarter delivery, other lots are for early shipment. This may result in rescheduling to keep within directed quotas. Mills before the latest buying were sold up on numerous items and to meet new requirements some of the original volume may be extended. While backlogs are heavily loaded with high carbon, ratio of low carbon in new volume is relatively higher. On quotas cold rollers are operating at 70 to 80 per cent of total capacity, although annealing shops and some other departments are scheduled full. On directives hot strip requirements are filled, but deliveries tend to accumulate late each month.

Plates . . .

Plate Prices, Page 95

Platemakers are preparing February schedules for submission to Washington and are planning greater output than in the past to meet expected enlarged demand for shipbuilding and other war uses.

As is usual early in a month buying is light. However, orders now on books are heavy and production is at capacity. Some interruption by floods in the East and along the Ohio river during the first week of January caused some loss of tonnage but production has been resumed and the tonnage lost was not as large as could have been expected, strenuous efforts returning production to normal within a short time.

Bars . . .

Bar Prices, Page 94

An important part of demand for carbon bars is from jobbers and forgers, principally for larger rounds and flats. Most large consumers require the heavier sections and as a result producers are unable to offer deliveries on new business much before late in second quarter. With inquiry relatively light for smaller sizes, shipment on high-rated tonnage is offered within six weeks on material up to 1⅛-inch diameter.

Cold-drawn bar sellers are receiving increasing demand from airplane engine builders and an expanding and substantial tonnage is going into ship work, not so much in shipyards as for engines and accessories.

Ammunition requirements are much less than several months ago but steel for shell components is in brisk demand. Machine tool builders also are taking heavy tonnages, though volume has declined in recent weeks. Delivery on cold-drawn carbon bars ranges from three to four months on top ratings. Shipments on alloy bars show no improvement, averaging about 35 weeks. With requirements of the airplane industry being increased rapidly it appears likely deliveries will be further extended.

Agricultural implement manufacturers expect to be able to increase their schedules in the early portion of the year. The 1943 quota of 20 per cent of the 1940 output is unchanged but WPB is seeking to move production ahead to provide equipment to farmers at the earliest possible date, in any event before October, in keeping with the drive for increased farm production.

Pipe . . .

Pipe Prices, Page 95

Merchant pipe distributors are experiencing some reversal from the situation of several weeks ago. At that time demand was heavier than they could meet but under directives they are receiving more pipe from mills, while demand is tapering, due to building restrictions. Maintenance and repairs are the principal source of demand in the construction field. Shipyards are taking a fair tonnage of merchant pipe but a substantial portion is on direct mill shipments. Distributors are encouraged by better supply as a few weeks ago they seemed on the verge of extinction.

Upward revision of warehouse steel pipe directive from 6¼ to 10 per cent has created considerable extra paper work for pipe mills. Warehouse quotas for first quarter had already been set up and programs established on the basis of 6¼ per cent, and the adjustment upward to 10 per cent has required a revision.

There is a possibility that warehouses will be able to get considerably more than the directive tonnage during first quarter. This will depend on the type of business booked by individual warehouses. Pipe producers do not now see much possibility of additional tonnage going to warehouses on low priority ratings as volume of high rated business is on the increase, and as a result pipe shipped to cover these orders during first quarter will probably be in excess of that shipped during fourth quarter of 1942.

Seamless mechanical tubing demand is still at maximum, with all producers pushing equipment to the limit. Capacity is available for standard pipe and for large size seamless pipe, although new buying for the armed forces, as well as possible extension of domestic pipe lines, may soon expand the backlog of orders for large size seamless tubes.

Railroad orders for boiler tubes and miscellaneous pipe for repair work are increasing rapidly and virtually all of this is being shipped on schedule.

Structural Shapes . . .

Structural Shape Prices, Page 95

Anticipating increase in the shipbuilding program, releases for plain structural material for ship yards are slightly heavier; demand for construction and engineering is light and fading fast. Structural mills, operating 60 to 65 per cent of capacity, are seeking tonnage, with deliveries possible in four weeks. Warehouse stocks are in better condition and ample in view of smaller demand from jobbers. Fabricating shop backlogs are disappearing and by next month unshipped construction tonnage will be practically gone. Fabricators are seeking miscellaneous work to fill the gap, ship assemblies, tank and heavy equipment contracts. Dislocations in shop crews and equipment are appearing with erectors doing little and while welding machinery is heavily engaged, other units are down or less active. One eastern fabricator directly engaged in shipbuilding has his structural fabricating shop engaged at about one-third capacity on vessel assemblies. Several are closing out heavy crane contracts with indications orders for heavy handling equipment are on the decline; the navy, new shipyards and extensions, depots and private industrial plants have installed or have on order most overhead crane equipment required for expanded operations.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 95

Despite sharply reduced rollings of concrete reinforcing bars, slack demand makes for a surplus with distributor inventories substantial in numerous instances; this situation is accompanied by price shading. Rail steel is specified over new billet material for a substantial part of the limited demand. For the small tonnage required sufficient rails are available. Having been reduced to group II of critical materials, concrete bars are likely to be classified in group III; in this list a surplus over demand exists.

Tin Plate . . .

Tin Plate Prices, Page 95

While tin plate producers have been given higher production quotas, they encountered difficulty in making out January rolling schedules, due to lack of orders, which, in turn, was attributed to delay of consumers in getting their PRP quotas. As there were, and still are, so many regulations governing the use of containers, fabricators did not wish to go ahead with their ordering until they knew precisely where they stood. As a result, tin plate producers have had to anticipate canmakers' needs as much as they dared and also do some guessing on lend-lease, in order to give themselves a fair schedule for this month. This was necessary not only to avoid excessive peaks later in the quarter, but to keep tin plate organizations as much intact as possible. Some tin mills were closed down through the greater part of December.

Pig Iron . . .

Pig Iron Prices, Page 90

While foundries will receive about as much pig iron in January as in December considerable shift as to suppliers is noted in some areas. An important eastern producer has been given a much heavier quota of basic iron and a number of his foundry iron consumers will be supplied from other sources. The shift is attributed to greater pressure for steelmaking grades in the district where these furnaces are located. This change will give quicker delivery.

While total shipments will not vary greatly soil pipe producers probably will receive less. Foundries making castings for machine tool builders have built up a supply greater than their customers can absorb, though tool production is at a high rate.

Foundries with low ratings have increasing difficulty obtaining iron, except where they also have some high-rated business. In the latter case they receive usually enough to cover both high and low priority business, especially where lots are small.

Several foundries in the East have participated in the order for 400,000 stoves recently placed by the government. Some foundries seeking a share in this order were left out because they are located in areas where labor already is heavily engaged in war work. Some foundries receiving stove orders have asked for directives to provide sufficient iron for this purpose.

Scrap . . .

Scrap Prices, Page 98

In general scrap consumers are in good position and reserves have been built up for several weeks by many melters. At the same time weather conditions hamper continued supply and the situation continues to hold possibilities of shortage before the winter is over. Due to the character of machine work steel turnings are appearing in some districts in greater volume than can be absorbed, causing some softness in that grade.

The St. Louis district finds supply tight and inroads are made on reserves from time to time. Shippers in the Southwest continue to ship to Pittsburgh tonnage normally sent to St. Louis and federal authorities have not been able to change this practice.

Mills in the Buffalo district are refusing shipments of machine shop turnings and some sizes of borings, as they have oversupply. Dealers complain of this action as they have large supply and as a result have cut the price on turnings $2 per ton to move the material.

In the Cincinnati area turnings have been reduced $1 per ton to facilitate movement by rail, and this has cleared the situation somewhat. The general supply in this district is easy.

In New England difficulty is met in moving alloy turnings, especially those

accumulated at non-consuming points. Demand is well under production. While these turnings are segregated as produced, uncertainty as to definite analysis is a factor in the slow movement, as relatively few lots can be guaranteed. Consumers are also concerned as to freight charges and the premiums which some alloy material commands. The combination of record production, high freight charges and prices causes tonnage to back up.

Chicago melters continue to receive sufficient scrap for current needs and steel production is not hampered by this factor. Reserves are not large but offer a cushion against bad weather conditions late in the winter.

Steel and iron scrap shipments to consuming mills from July through October were 57.7 per cent of the national quota of 17,000,000 tons for the last six months of 1942, according to the conservation division of WPB. October shipments of approximately 2,762,000 net tons increased consumers' inventory of purchased scrap by about 460,000 tons, to a point about 47 per cent higher than a year previously. This does not reflect scrap collections made in October which were not processed and shipped.

Metallurgical Coke . . .

Coke Prices, Page 95

No clarification has come on the problem of increased freight cost due to new taxes, as applied to beehive coke producers. Marginal coke producers have been operating on such a thin profit that the additional load, unless they are permitted to pass it along to customers, may cause loss.

There is a slight increase in demand for foundry and furnace grades. The bottleneck is not so much in coke oven capacity as in ability to get acceptable coking coals at prices allowing a profit. About 1000 ovens in the Western Pennsylvania district are idle because cost of operation is too high. Most of the idle ovens are hand-drawn, high-cost units, located far from sources of good coking coal.

Sellers report increasing demand from consuming districts west of Pittsburgh. Orders have been coming from consum-

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

ers as far west as Chicago, but specifications have been too high for the lower grade of coke which can be produced from available coal.

Warehouse . . .

Warehouse Prices, Page 97

Latest amendment by WPB of Order M-21-b permits warehouses this quarter to make up in their receipts the tonnage they fell short of receiving on 1942 quotas, although the inventory limitation of this order will prevent some warehouses from catching up fully on last year's deficiency. The order prohibits distributors' inventories on March 31 from exceeding a four-months' supply, one and one-third times the quarterly quota for any product except tool steel bars, which may be twice the quarterly quota.

Because of this limitation, warehouses which fell far behind their full quotas last year will be in no better stock position next April in relation to their quotas than will other houses which were able to maintain their receipts more closely to the allowed tonnages.

Some warehouses inject a note of caution in their optimism over the improved stock outlook, pointing out that the easier supply situation in some products at the mills and the prospects for a more orderly distribution of steel generally under the Controlled Materials Plan will cause the loss of some customers. At the same time, the definite and important position of warehouses as a supply source under CMP assures a sizable movement of steel products through this channel.

Demand for most hot-rolled products from warehouse has slackened, notably in structurals and pipe, but in most cases is due to year-end seasonal influences. Most distributors are hopeful of being better covered on hot-rolled products during first quarter.

Cold-finished and alloys continue tight with demand holding. Scattered improvement in cold-finished bars, mostly small sizes, is noted; frozen stocks of that item have been mostly liquidated, largely through jobbers and strip in this category appears in greater volume than most steels. So substantial has been the improvement in mill shipment of small hot rounds, 1⅝-inch and under, that some warehouses are holding up shipments and are currently well stocked. Heavy demand is maintained for wider flats, both hot and cold-rolled, with narrower stock easier. For weeks a recession in nail buying has been predicted, but has not yet developed.

Office of Price Administration has issued dollars-and-cents prices on warehouse materials sold at retail, in the main the same as those prevailing April 16, 1941. Slight changes will be made in some cases, but recent quotations will prevail in most instances.

Steel in Europe . . .

London — (*By Cable*) — Larger demand for all steel products is expected in 1943 in Great Britain. Prospect of obtaining North African iron ore is welcomed. Mills are heavily booked with plates, bars, structural steel and special steels. Pig iron supplies are adequate.

Pacific Coast . . .

Seattle — Opening of first quarter finds Pacific Northwest rolling mills with considerable order backlogs of merchant bars, demand for which is increasing with the speed of ship construction. Prospects are that merchant bars will continue in strong position for the next six months, giving mills capacity operation. This is the reverse of normal conditions when reinforcing is in the lead and merchant tonnage of secondary importance. However, reinforcing tonnages are slow and mills have rolled all their orders. Occasional lots are placed for government contracts whose requirements on pending projects vary, but no new reinforcing commitments are being made. Army and navy construction in recent months has been confined to wooden structures, to conserve steel for other purposes. Shipyard orders for merchant bars rate AA-1 and receive prompt attention. Jobbers have also bought to the extent of quotas.

The scrap situation is causing no anxiety, as available stocks are ample for six months. Mill yards are filled to capacity and thousands of tons gathered in the recent cleanup are awaiting pick-up and sorting.

Fabricating shops report little interest. Some plants are fully occupied with army and navy contracts while others are seeking new business. This phase of the industry does not appear promising for the immediate future, following a year of intense activity, working against time.

Demand for cast iron pipe is dormant, due to difficulties in obtaining priorities. Dealers report small lots moving out of stock but no major jobs are up for bids. Potential demand is unlimited as many cities plan extensions which have been postponed for the duration.

Details are not available of proposed expansion of facilities at the plant of the Boeing Aircraft Co. for which the Defense Plant Corp. has allotted $1,800,000, making total commitments for this firm in excess of $18,000,000. The same agency announces a contract to Coast Carbons Inc., Tacoma, Wash., with allotted funds of $200,000 for additional facilities.

Seattle is working out a new agreement with WPB for salvage of 10,000 tons of street car rails. The government refused the city's offer of $60 a ton and countered with $45 a ton, city to remove the rails and repair the streets, with an alternate that WPB take the material and repair the streets, no revenue to the city.

Seattle Light department, with a government grant of $2,230,000 for the proposed $8,300,000 Ross dam extension, will soon call for new bids which will include both construction and equipment. First bids opened Aug. 6 and rejected included a joint offer of $6,146,214 for the general contract and $17,800 each for two 72-inch and $11,050 each for two 48-inch valves by S. Morgan Smith Co.

Satisfactory results are reported from Bandon, Oregon, where a pilot plant has been in operation testing chromite sands of the Oregon beaches. Plans are now in the making for a movable

master plant. A central plant, financed by Defense Plant Corp. is being built to grade and concentrate ore for local chromite operators.

Canada . . .

Toronto, Ont.—Facing an increase in Canada's war materials production program, which is expected to reach its peak during the present quarter, it is indicated that iron and steel requirements this year will register a gain of from 25 to 50 per cent over the high total of last year. While it is early to expect completed specifications from big consumers of steel and other metals in connection with requirements for several months ahead, some large contracts have been closed during the past week or ten days and mill representatives look for a sharp upswing in demand before the end of the month. According to government announcements there will be further curtailment in civilian uses of steel and metals this year and even some of the essential requirements will be substantially reduced. Conservation measures adopted by the Government and many war plants also will make available thousands of tons of steel that previously had been wasted during the running-in period for mass war production in this country. Despite curtailment in non-war uses of steel and the various conservation measures adopted, it is estimated that if this country reaches the full production swing planned, Canada's enlarged steel production capacity will be able to provide about the same percentage as in the past year, approximately 60 per cent, the remainder to be provided by imports from the United States.

While business has not yet recovered from the holiday season and orders are somewhat limited, a few large contracts were closed during the week. Further orders for plate dominated the market, with several thousand tons reported from shipbuilding concerns in Ontario, covering requirements for a number of ships on which construction will be started soon. Large orders also are expected from other shipbuilding companies, indicating there will be no slowing in demand and Canadian mills will maintain record-breaking production schedules for an unlimited time. Plate imports from the United States also are said to be slated for a sharp increase.

A few large orders for sheets were reported in the past few days, but volume is somewhat below the average for the past year. Mill representatives, however, report backlogs covering production for the next six months and most commitments are for delivery well into second quarter.

No special developments were reported in merchant bars during the week, although a few inquiries have appeared, indicating a new rush of orders before the month ends. Interest is chiefly in high carbon and alloy bars for war plants. No actual shortage of bars was reported over the past two or three weeks, chiefly due to the fact that better deliveries appeared from the States in the past month and many consumers were successful in establishing fair stocks.

Structural steel lettings are disappearing under restricted construction programs. While awards for the week totaled about 800 tons, the most important was one to Dominion Bridge Co., Toronto, for 200 tons for alterations to a

local department store. Demand for reinforcing bars is fairly steady. Burlington Steel, Hamilton, received a small order for the C.P.R. shops at West Toronto of about 100 tons.

Merchant pig iron sales have been slow for the past couple of weeks, but inquiries again are appearing and business is expected to return to normal within the next week or ten days. Sales for the past week dropped to about 3000 tons, chiefly lots of one to two cars. Basic iron was practically at a standstill.

The heavy snow that blanketed most of Ontario during the week, not only brought shipments from outside points to a standstill but slowed down deliveries from local sources. Dealers also reported difficulty in handling yard stocks. Incoming scrap is now well below actual day-to-day requirements and for the remainder of the winter mills, electric furnaces and other consumers will have to depend on stock accumulations. In order to maintain iron and steel production at the high rate of the past couple of months, steel mills will require approximately 175,000 tons of scrap iron and steel per month. It is estimated that for the current year total scrap requirements for Canada, other than scrap of consumers' own make, will total about 1,500,000 tons.

Equipment . . .

New York — Shipments of machine tools are maintained at close to 30,000 units a month. Deliveries exceed new orders and backlogs of some builders are moderately lower, but not to the extent expected in view of the ratio of shipments to new orders prevailing for some months. Purchases by the aircraft industry are heavy; diverted deliveries and revised schedules center on additional tooling of engines and assembly plants.

Considerable volume has been cancelled by the ordnance department. Machines affected are readily moved to other buyers as a rule; some who held off purchases because of extended deliveries are taking these tools on earlier shipments. On more lines deliveries are improving. Some pool orders have also been cancelled by WPA, 25 to 30 borderline builders organized for temporary machine tool production being affected more than the regulars. Few pool orders are now placed and those on the books will be completed by late spring. Shipments of machine tools in 1942 are estimated at close to 315,000 units, compared with 194,000 the previous year.

Boston — While expansion in heat-treating capacity for war requirements has been tremendous, production of industrial electric furnaces last year being approximately 15 times greater than any pre-war year, additional orders for equipment continue to be placed. A substantial volume of cold strip steel is now heat-treated. Annealing of steel cartridge cases, steel substituted for brass, has created a strong demand for electric annealing furnaces. While most additional capacity is installed at steel and metal fabricating plants, much of the conveyor type, demand on shops specializing in heat-treating only has forced numerous expansions, in some instances with much larger units for handling heavier work.

Massachusetts Steel Treating Corp., Worcester, is increasing capacity, especially for heavier work, three-fold, by installation of two large gas furnaces. Before the war there were no large industrial gas furnaces in New England. The new furnaces, one just getting into operation, are housed in a new building 40 x 1000 x 25 feet, a five-ton P & H crane traversing the entire length.

The first unit is a National gas furnace with Leeds & Northrup recording potentiometers and with proportioning controls. This furnace has two cars: one car always being in the furnace while the other is loaded or unloaded. The capacity of this car is approximately 30 tons. The size of this furnace is 6 feet wide, 5 feet high, 18 feet long. One of its features is that it is fired by gas horizontally and vertically; this increases the accuracy of heating, maintaining temperature control of, plus or minus 10 degrees, throughout the furnace. The second and new furnace is of the same type but of larger dimensions, 6 feet wide, 6 feet high, and 24 feet long. Capacity of this unit is 40 tons. The Worcester shop also includes another building for handling high speed steel, welding, and maintenance work. The new equipment in this building consists of one Charmo furnace; one Leeds & Northrup tempering furnace; one National gas atmosphere furnace; and one high-speed Case salt bath furnace.

New Hydraulic Forging Press Is Demonstrated

(*Concluded from Page* 25)

Millan, company president, and by several of the company's district representatives.

While most open forging presses now in use are of the steam-hydraulic type, the picture may be changed soon for this new type self-contained hydraulic press appears to have important possibilities. It is dissimilar to the conventional steam-hydraulic press which requires considerable auxiliary equipment such as boilers, accumulators, intensifiers, reciprocating pumps and the like. The most noticeable feature is two 200-horsepower motors, driving two hydraulic pumps mounted on top of the press itself. The Fastraverse principle of press operation utilized provides for prefilling exhaust of the main cylinder during rapid traverse movement of the ram. With overhead oil tank mounted alongside main cylinder, no cavitation occurs in filling the press cylinder, so pressure builds up quickly to advance press ram, platen and upper die block to and from the work at a rate of 560 inches per minute. Pressing speed is 105 inches per minute at 1000 tons working pressure.

Additional Features

Another feature of the press is that reversal of ram travel is obtained without an operating valve, the radial pump delivery being reversed by the same operating lever that starts and stops ram travel. Both length and speed of ram travel are adjustable. Pressure builds up automatically to maximum pressure, if necessary, as soon as resistance is met. This can be at any point within the limits of the ram travel. Amount of pressure applied is under control of the operator at all times through the single control lever.

Since there is no auxiliary equipment and only a single foundation is required, first cost of such a press is low; operation is economical due to efficiency of the radial piston-type pressure generators; maintenance is reported low because of few moving parts, automatic lubrication, permanent metal-type packings as well as elimination of long pipe lines and numerous valves.

Specifications of the 1000-ton forging press include: Pressing surfaces (left to right and front to back)—platen, 72 x 48 inches; bed, 72 x 111 inches; bolsters (upper and lower), 68 x 48 x 9 inches thick; die blocks (upper and lower), 36 x 12 x 30 inches high; maximum daylight openings—platen to bed, 108 inches; between die blocks, 30 inches; maximum ram travel, 42 inches; ram

Nonferrous Metal Prices

Jan.	Copper, Electro, del. Conn.	Copper, Lake, del. Midwest	Copper, Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures
1-7	12.00	12.12½	11.75	52.00	52.00

F.o.b. mill base, cents per lb. except as specified. Copper and brass products based on 12.00c Conn. copper

	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
	6.50	6.35	8.25	15.00	14.50	35.00

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

speeds—closing and opening, 560 inches per minute; pressing, 105 inches per minute; motors required—two 200-horsepower at 720 revolutions per minute; shipping weight, 244,500 pounds.

Nonferrous Metals . . .

New York—Production will continue to be the keynote of the major nonferrous metal industries in 1943.

Ernest V. Gent, secretary of the American Zinc Institute Inc., has reported that scheduled peak production of zinc was delayed last year because of priority and manpower problems and will not be reached until the second quarter of 1943. He cited the need for the liberalization and expansion of the premium price limits and warned that, if immediate problems are not solved, 1943 domestic ore estimates will need to be discounted and the outlook beyond will seriously deteriorate.

Roy A. Hunt, president of Aluminum Co. of America, revealed that when the plants Alcoa is building for Defense Plant Corp. are completed and the peak of 1943 production is reached, there will be a capacity in this country to make 2,100,000,000 pounds of aluminum annually.

Widens Export Control On Critical Materials

Export trade is being advised of expansion in the scope of M-148, relating to exports of critical material. It is being extended to apply not only to Latin-American countries but all others to which American shipments have been under license of the Bureau of Economic Warfare. The change apparently is to standardize procedure and it is believed it will not affect volume of materials exported to these countries as BEW has had authority to approve or disapprove all exports not under lend-lease.

Mills are being advised of their first quarter quotas under M-148 on principal products. Some exporters regard these quotas as limitations beyond which they are not permitted to sell, rather than quantities they must supply.

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.

New York office, Contract Distribution Branch of WPB, 122 East Forty-Second street, New York, reports the following subcontract opportunities:

S-77-6669: Ohio concern seeks hand screw machine facilities. Contact shoe, three sizes. Quantity, 10,000 to 25,000, of coin silver bar stock, ⅛ x ⅜-inch.

S-77-6674: New York procurement agency seeks subcontracting facilities for 1600 steel shackles requiring hand forging and trip hammer facilities.

S-77-6814: New York contractor seeks facilities on steel forging, 1020 steel, weight approximately 4½ pounds. Quantity, large. Requires 4000-pound drop hammer. Dies will be supplied.

S-77-6815: New York manufacturer seeks gray iron casting facilities. Pattern making, casting and machining required. Approximately 68 inches diameter, weighing 1200 pounds.

S-79-7206: New York City manufacturer seeks steel casting facilities for making sides and sheaves for tackle blocks. Average weight is 15 to 20 pounds each. Daily output required, 1000 to 2000 pounds of castings.

S-79-7174: An upstate New York concern seeks subcontractors for molding aluminum and magnesium. Sizes from 6 to 10 inches diameter, 8 to 10 inches in length and 1 to 5 pounds in weight.

S-79-7185-7186: A Connecticut manufacturer seeks subcontracting facilities on thread milling work ready some time in January at rate of 50 units each per week. Total quantity will be 2800 each on AA-1 priority.

S-78-6988: New York City manufacturer seeks subcontracting facilities for the following: Enameling facilities for spraying and baking on malleable iron castings and stamped steel items; screw machine facilities from ⅛ to 2 inches in steel, brass, aluminum and nickel silver. Substantial quantities.

S-78-6694: New York City machine shop seeks subcontracting facilities for hydraulic presses with 50-inch bed for blanking aluminum aircraft parts, 20-gage metal. Dies must be Masonite or equivalent. Gear-cutting facilities for bevel and spline gears, 2500 to 3000 assemblies per month. Prints and specifications must be inspected at premises of prime contractor.

S-78-6987: Rochester, N. Y., concern is seeking open capacity on automatic screw machines, as follows: One 1⅞-inch bar stock, two 1⅝-inch bar stock, two 2½-inch bar stock, all four or six-spindle. Tolerance, plus .000, minus .003. Material SAE 1020 steel, which is supplied. Volume, large.

S-78-6931: Procurement agency is seeking subcontracting facilities on No. 3 universal Warner & Swasey or equivalent turret lathe.

Minneapolis office, Contract Distribution Branch of WPB, 334 Midland Bank building, is seeking contractors for the following:

S.O. No. 294: Part, recoil cylinder, approx. 38 inches long and 5 inches diameter. Facilities, horizontal boring mill, 3 inches or larger, milling machine No. 3, welding. Operations, boring and honing of wide diameter I.D., machining of various brackets and welding brackets to O.D. Quantities, large. Tolerance, .001. Material, forging, furnished. Drawings at Minneapolis office.

S.O. No. 300: Part, plug pin, five sizes. Facilities required, automatic screw machine ¼-inch. Quantities, 100,000 of each size, orders will be repeated. Delivery, soon as possible. Tolerance, .004. Material, half-hard brass, furnished by subcontractor. Price set by prime contractor. Drawings at Minneapolis office.

S.O. No. 301: Part, valve spring washer. Facilities required, screw machines 2.06-inch diameter, heat treating. Quantities, very high. Deliveries, soon as possible. Tolerance, .001 in six inches on tapered hole. Material, nickel-chromium steel. Drawings at Minneapolis office.

S.O. No. 302: Numerous small arms parts. Operations, various, depending on the part, milling, profiling, grinding, heat treating, forging, screw machine, etc. Quantities and deliveries not stated. Prime contractor will consider any qualified contractor. Drawings at Minneapolis office.

S.O. No. 304: Part, jigs, fixtures, tooling. Facilities required, toolroom. Quantities, 1 to 5. Precision work. Material, subcontractor to furnish. Instrument manufacturer has continuous need for special jigs, fixtures and tooling. Price on quotation basis. Drawings at Minneapolis office.

S.O. No. 307: Part, casing bottom. Facilities required, vertical boring mill 62-inch or larger. Quantities, large. Deliveries, soon as possible. Tolerance, .0016. Material, cast iron, castings furnished. Price, $25 to $44, including freight. Gages furnished. Drawings at Minneapolis office.

S.O. No. 308: Part, gage fitting. Facilities required, automatic and hand screw machines. Operations, drilling, threading, tapping. Quantities, 35,000 lots, probably over 100,000. Deliveries, 10,000 per month, starting early in January. Tolerance, .010. Material, ⅜-inch square brass rod. AA-1 priority. Part, valve. Facilities required, automatic screw machine, drilling and milling. Quantities, as above. Tolerance, .002. Material, ⅞-inch steel rod, AA-1 priority. Drawings of both parts at Minneapolis office.

S.O. No. 283: Forging five parts for 5-ton snatch block from 1 to 8 pounds each. Material, 1025 or 1030 steel. Quantity, 50,000. Also forging of hub, 6½ inches long at hub by 9 inches largest diameter of flange. Quantity, 100,000. Drawings at Minneapolis office.

S.O. No. 305: Part, pintle cradle. Facilities required, 1L or 2L Gisholt or 2A Warner & Swasey or equivalent. Quantities, 4000 to 5000, deliveries of 1800 per month. Tolerance, .001. Material, forging, 1355 steel, furnished by prime. Price, $2.25 to $2.50 each. Prime contractor will furnish special holding fixture and engineer for first setup. Requires two machines, 22½ hours per day, 30 days per month. Drawings at Minneapolis office.

Boston office, Contract Distribution Branch of WPB, 17 Court street, is seeking contractors for the following:

SC-38: Multiple screw machine work for machines having 2-inch diameter bar capacity. Material, hex steel SAE 1095, supplied by prime contractor. Quantity, 100,000 required at rate of 7500 per week. Reference 1-E-17.

SC-39: Multiple screw machine work for machines having ¾ to 2½-inch diameter bar capacity. Secondary operations on hand turrets and drilling. Material, SAE 1112 steel, supplied by prime contractor. Three items. Liberal tolerances. Quantity, 300,000 each at rate of 7500 each per week. Reference, 1-A-386.

SC-40: Suitable facilities for producing dies ranging in size from 9 x 9 inches to 12 x 15 inches. Die blocks will be supplied by prime contractor. Minimum requirements, four per month. Reference, 1-A-436.

SC-41: Single spindle automatic screw machine facilities having 6-inch diameter bar capacity. Ball thrust bearing rate, groove type. Material, steel tubing, SAE52100, supplied by prime contractor in February, 1943. Quantity, 6000 required at rate of 400 per week, starting in March, 1943. Reference, 1-J-53.

STRUCTURAL SHAPES . . .

SHAPE CONTRACTS PLACED

700 tons, plate work, new ore docks, Escanaba, Mich.; Merritt, Chapman & Scott Corp., contractor.

SHAPE CONTRACTS PENDING

126 tons, bridge, Port street access road, Newark, N. J.; bids Jan. 13, Trenton; also 25 tons reinforcing steel; project rated AA-5.

100 tons, sintering building, Republic Steel Corp., Chicago, to Mississippi Valley Structural Steel Co., Decatur, Ill.; James Stewart Corp., Chicago, contractor.

REINFORCING BARS . . .

REINFORCING STEEL AWARDS

200 tons, detinning plant, Long Island City, N. Y., to Carroll-McCreary Co., Brooklyn.

100 tons, commissary building, Great Lakes Naval Training Station, Great Lakes, Ill., for navy, to Joseph T. Ryerson & Son Inc., Chicago; W. E. O'Neil Construction Co., Chicago, contractor.

76 tons, repairs and alterations, state hospital, East Moline, Ill., to Ceco Steel Products Corp., Chicago; Kinnmare Corp., Chicago, contractor.

RAILS, CARS . . .

CAR ORDERS PENDING

Atchison, Topeka & Santa Fe, 1000 freight cars, including 300 seventy-ton steel Hart convertible ballast cars, 300 fifty-ton composite flats, 200 seventy-ton composite drop-end gondolas and 200 fifty-ton composite twin hoppers; bids asked.

St. Louis-San Francisco, 250 composite gondola cars and 75 fifty-ton composite box cars; court permission asked.

LOCOMOTIVES PLACED

New York Central, twenty-five 4-8-2 steam locomotives, to Lima Locomotive Works, Lima, O.; approved by War Production Board.

LOCOMOTIVES PENDING

St. Louis-Southwestern, three diesel-electric locomotives; court authority asked.

CONSTRUCTION AND ENTERPRISE

ILLINOIS

BLUE ISLAND, ILL.—Wickwire Spencer Steel Co., 221 North LaSalle street, Chicago, will spend approximately $50,000 for remodeling factory here.

CHICAGO—Pullman-Standard Car Mfg. Co. is engaged in reconstruction and rehabilitation for additional aircraft work in connection with war program.

CHICAGO—Octigan Forge Co., 2428 South Lowe avenue, is making several additions to its present premises.

CHICAGO—Templeton, Kenly & Co., 1020 South Central avenue, maker of lifting jacks, is constructing an additional building to its plant.

CHICAGO — Advance Aluminum Castings Corp., 2742 West Thirty-sixth place, has completed additions to plant capacity necessitated by war demands.

CHICAGO—Northern Metal Products Co., 2911 Carroll avenue, has purchased one-story manufacturing building on West Lake street which will double production space for signal corps components.

CHICAGO—Cook Electric Co., 2700 North Southport avenue, is expanding its manufacturing facilities to accommodate expanding war production.

CHICAGO—Solar Mfg. Co., Bayonne, N. J., is establishing manufacturing operations here through purchase of plant at 4501 South Western avenue.

CHICAGO—R. Lavin & Sons Inc., 3426 South Kedzie avenue, smelter and refiner of nonferrous metals, is undertaking substantial rehabilitation to meet increasing demands for its product. Rissman & Hirschfeld, 65 East South Water street, architects.

CHICAGO—Carbide Tool Co., 816 North Kostner avenue, is erecting two-story addition to its plant, the fourth expansion since the beginning of the war program.

CHICAGO—Eversharp Inc., 1800 West Roscoe street, is erecting two-story plant. Alfred S. Alschuler & R. N. Friedman, 28 East Jackson street, Chicago, architects.

CHICAGO—Standard Transformer Corp., 1500 North Halsted street, is making small expansion to its plant.

CHICAGO—Acme Aluminum Foundry Co., 6843 South Bell street, is undertaking a rehabilitation and expansion program to enlarge production facilities.

CHICAGO—Air Castle Inc., 1134 North Kilbourn avenue, has acquired three-story plant containing 18,000 square feet, and one and a half acres of land for future expansion at 2030 North Natchez avenue.

CHICAGO—Alloy Steel Gear & Pinion Co., 4847 West Division street, has purchased a 50 x 125-foot lot adjoining its property and will build $40,000 plant addition.

HARVEY, ILL.—Buda Co. is taking over the former warehouse of American Stove Co. which will provide 60,000 square feet of additional space.

LINCOLNWOOD, ILL.—Bell & Howell Co., 1801 Larchmont avenue, Chicago, has plans by Mundie, Jensen, Bourke & Havens, 39 South LaSalle street, Chicago, for foundry. Estimated cost $500,000.

NEW JERSEY

FINDERNE, N. J.—Diehl Mfg. Co., Finderne avenue, has awarded contract to Austin Co., 19 Rector street, New York, for three-story building.

PORT READING, N. J.—Reading Co., A. E. Owen, chief engineer, Twelfth and Market streets, Philadelphia, will soon let contract for one-story boiler house here.

OHIO

CLEVELAND—Parts Development Inc. is being chartered by interests connected with Engineering Service Inc., 1414 Standard building, to operate a shop here for manufacture of tools, jigs and dies. Attorney and agent for the new firm is Arnold Edelman, 440 Leader building.

CLEVELAND—Cleveland Graphite Bronze Co., James L. Myers, secretary, is erecting a $75,000 addition to its castings cleaning building at 16800 St. Clair avenue.

CLEVELAND—Eaton Mfg. Co., 739 East 140th street, has been awarded contract by Defense Plant Corp. in excess of $100,000 to provide additional machinery and equipment for an Ohio plant.

ELYRIA, O.—Romec Pump Co. has let contract to J. C. F. Shafer Co., Caxton building, Cleveland, for factory, heat treating build-

ing and office. Estimated cost $100,000. Silsbee & Smith, Turner building, architects.

NILES, O.—National Gypsum Co., Walnut street, plans 8000-square foot plant expansion.

PENNSYLVANIA

AMBRIDGE, PA.—National Supply Co., Grant building, Pittsburgh, has awarded contract for improvements to manufacturing plant here to Cook-Anderson Co., Fifth and Insurance streets, Beaver, Pa. Hoffman & Crumpton, Century building, Pittsburgh, architects.

BRISTOL, PA.—Rohim & Haas Co., Bristol pike, will build plant.

DUQUESNE, PA.—Bids are being taken for transformer building and heat treating facilities at the Duquesne works of Carnegie-Illinois Steel Corp., Carnegie building, Pittsburgh.

PITTSBURGH—Acme Stamping & Mfg. Co., Corliss street, has plans for addition to office and factory building. Braziell & Farrell, 310 Magee building, architects.

MICHIGAN

DEARBORN, MICH.—Dearborn Tool & Die Co., 10200 Ford road, has been incorporated to deal in automotive, marine and farm implements and parts. Correspondent: James A. Clark, 5821 Steadman, Dearborn.

MUSKEGON, MICH.—Hall Electrical Co., Muskegon, has been awarded contract for heat treatment, sand blasting and plating department for Continental Aviation & Engineering Corp. in Muskegon.

LOUISIANA

NEW ORLEANS—Consolidated Aircraft Corp., San Diego, Calif., has acquired plant here for manufacture of navy planes. William Nelson is acting division manager of proposed plant.

WEST VIRGINIA

MARTINSBURG, W. VA.—Explosive Products Corp., Fifteenth and G streets, Washington, is having plans completed for manufacturing plant near here. Approximate cost $5,000,000.

SOUTH CHARLESTON, W. VA.—Work has been started on alterations to manufacturing plant at Naval Ordnance Plant here. Owner, United States government, Navy Department, Washington. Lessee, Carnegie-Illinois Steel Corp., Carnegie building, Pittsburgh. Edward Crump Jr., 4031 Bigelow boulevard, Pittsburgh, general contractor.

MISSOURI

KANSAS CITY, MO.—National Distillers Products Corp. will operate alcohol plant to be erected here by government. Estimated cost $1,800,000.

ST. LOUIS—Don V. Davis Co., Don V. Davis, owner, 1535 North Eighth street, will build plant for manufacture of cellulose lacquer, costing approximately $30,000.

ST. LOUIS—Krey Packing Co., 2100 Bremen avenue, has let contract to Woermann Construction Co., 3800 West Pine boulevard, for altering and constructing addition to meat packing plant. Cost estimated at $40,000, including equipment. Henschein, Everds & Crombie, 59 East Van Buren street, Chicago, engineers and architects.

ST. LOUIS—L. M. Persons Corp., 6319 Manchester avenue, has let contract to Robert N. Hinkson, Kirkwood, Mo., for one and two-story addition to plant. Estimated cost $20,000.

ST. LOUIS—McCable-Powers Auto Body Co., 5900 North Broadway, has building permit for factory building at 3815 Prescott avenue. Al P. Daly Construction Co., general contractor.

WISCONSIN

MILWAUKEE—Pelton Steel Castings Co., 148 West Dewey place, has plans by Building Engineering Services, 1101 North Van Buren street, for one-story factory buildings. Estimated cost $70,000.

MILWAUKEE—Milwaukee Machine Products Co., 1655 North Water street, has let contract for one-story factory and office building to F. J. Hinton, 1721 North Water street.

WEST ALLIS, WIS.—Allis-Chalmers Mfg. Co., 1126 South Seventieth street, has awarded contract for alterations and addition to tractor building to Meredith Bros. Inc., 121 East Washington street, Milwaukee. C. E. Meyer, care of owner, architect.

MINNESOTA

SOUTH ST. PAUL, MINN.—Farmers Union Central Exchange, E. A. Syfestad, manager, 1200 North Concord street, will build $1,000,000 oil refinery.

ST. PAUL, MINN.—Twin City Testing & Engineering Laboratory, C. W. Britzius, president, 2482 University avenue, has plans by Toltz, King & Day, 1509 Pioneer building, for one-story laboratory and office building. Estimated cost $40,000.

CALIFORNIA

ALHAMBRA, CALIF.—Building permit has been granted for factory at 230 Date street for American Pipe & Steel Co., to cost $40,000.

LOS ANGELES—Building permit has been issued for addition to factory of L. & F. Machine Co., 2110 Belgrave avenue, Huntington Park.

CANADA

HARTNELL, ALTA.—Gas & Oil Products Ltd., 301 Lancaster building, Calgary, has begun preliminary work on addition to plant here, to cost about $45,000 with equipment.

PRINCETON, B. C.—Granby Consolidated Mining, Smelting & Power Co. Ltd., 675 Hastings street West, Vancouver, B. C., will start work immediately on plant building and installation of equipment here to cost about $35,000.

TRAIL, B. C.—Consolidated Mining & Smelting Co. of Canada Ltd. plans to start work immediately on plant additions and installation of equipment, to cost approximately $95,000.

VANCOUVER, B. C.—Patterson Iron Works Ltd., 736 Alexander street, has had plans prepared and will let contracts for plant ad-

dition to cost about $50,000, with equipment.

WINNIPEG, MAN.—S. & S. Aircraft Ltd., 215 Watt street, has given general contract to Fraser & MacDonald Ltd., 911 Somerset building, for plant addition to cost about $35,000.

WINNIPEG, MAN.—Winnipeg Cold Storage Co. Ltd., Jarvis and Slater streets, has had plans prepared for plant addition to cost about $200,000, with equipment.

DELORO, ONT.—Deloro Smelting & Refining Co. Ltd., has completed foundations for building to house refining furnace and also will erect other buildings in its expansion program, at estimated cost, with equipment, of about $45,000.

FORT ERIE, ONT.—Department of Munitions and Supply, H. H. Turnbull, secretary, Ottawa, has given general contract to Redfern Construction Co. Ltd., 30 Bloor street West, Toronto, for further plant addition to cost about $150,000.

HAMILTON, ONT.—Currie Products Ltd., 87 Sheaffe street, has given general contract to W. H. Yates Construction Co. Ltd., 400 Wellington street North, for reconstruction of plant to cost about $16,000, equipment extra.

HAMILTON, ONT.—N. Slater Co., Sydney street, has awarded general contract for plant addition to W. H. Cooper Construction Co., Ltd., Medical Arts building. Estimated cost $35,000, with equipment.

HAMILTON, ONT.—International Harvester Co. of Canada Ltd., Sherman avenue North, has plans for plant addition, estimated to cost $35,000, with equipment.

LONDON, ONT.—Beatty Bros. Ltd., has given general contract to Roy James Construction Co. Ltd., 1054 Colborne street, for plant addition to cost, with equipment, about $50,000. H. E. Craddock, superintendent.

NIAGARA FALLS, ONT.—Oneida Community Ltd., Ontario road, has plans for plant addition and installation of surface combustion annealing furnace, estimated to cost about $20,000.

OAKVILLE, ONT.—Barringham Rubber Co. Ltd., Reynolds street, North, has given general contract to W. H. Cooper Construction Co. Ltd., Medical Arts building, Hamilton, for plant addition to cost $155,000, with equipment.

SAULT STE. MARIE, ONT.—Algoma Steel Corp. Ltd., Wilde avenue, has begun work on repairs to open-hearth furnaces, under supervision of its own staff, to cost approximately $100,000.

ST. THOMAS, ONT.—St. Thomas Bronze Co., Wellington street and First avenue, plans further addition to plant here. D. M. Loucks is manager.

TORONTO, ONT.—Dominion Bridge Co. Ltd., 1139 Shaw street, will start work soon on plant addition to cost about $10,000.

WESTON, ONT.—Massey-Harris Co. Ltd., 915 King street West, Toronto, has let additional sub-trades and work is proceeding on $1,500,000 aircraft plant here. A. W. Robertson Ltd., 57 Bloor street, West, Toronto, general contractor.

LAUZON, QUE.—George T. Davie & Sons, 27 Davie street, has given general contract to L. P. Gagnon, St. David, Levis, Que., for plant additions to cost about $100,000.

MONTREAL, QUE.—Canadian Marconi Co. Ltd., 2440 Trenton avenue, has extended contract to A. F. Byers Construction Co. Ltd., 1226 University avenue, to include further plant addition to cost about $125,000 with equipment. James C. Meadowcroft, 1154 Beaver Hall Hill, is architect.

MONTREAL, QUE.—Canadian Machinery Works Co., 752 Rachel street, East, has suspended work in connection with machine shop addition until the middle of January.

MONTREAL, QUE.—Dominion Rubber Co. Ltd., 550 Papineau avenue, will let contracts and start work soon on plant addition to cost about $10,000.

MONTREAL, QUE.—Blocktube Controls of Canada Ltd., 5460 Bordeaux street, has given general contract to Cecil Carpenter & Co. Ltd., 5139 Decarie boulevard, for plant addition to cost about $40,000, with equipment.

MONTREAL, QUE.—Canadian Power Boat Co. Ltd., 4000 St. Patrick street, has given general contract to A. W. Robertson Ltd., 57 Bloor street West, Toronto, and number of other sub-trades have been let for plant addition to cost about $130,000, with equipment.

ST. HYACINTHE, QUE.—City, M. A. David, clerk, has given general contract to Dansereau Limitee, 1387 Bernard avenue West, Montreal, for addition to filtration plant to cost about $250,000, with equipment. Adrien Plamondon, 369 Mount Royal avenue, Montreal, consulting engineer.

THREE RIVERS, QUE.—Aluminum Co. of Canada Ltd., 1010 St. Catharine street West Montreal, has given general contract to Fraser Brace Engineering Co. Ltd., 360 St. James street West, Montreal, and preliminary work has been started on an aluminum plant here, estimated to cost about $3,000,000.

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2—Bliss Mills
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2—Broden mills same as above except rolls 8" diameter by 5½" face, and chain driven.
All mills equipped with one take-up for each two mills. Also all mills equipped with edge rolls. Also in first class operating condition. Address Box 815, STEEL, Penton Bldg., Cleveland.

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STEEL BUILDINGS
With or Without Crane
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Four (4) FEDERAL SPOT WELDERS, 30 KVA, 220 Volt, 60 Cycles. Like New. Quick delivery at a price considerably less than new machines.

Other older machinery also available.

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Apollo, Pa.

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GUARANTEED REBUILT VALVES OF ALL TYPES FROM 2" to 20".
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RAILROAD SCALES, CRANES, ETC.

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PRESSURE BLOWERS

(3) Buffalo Forge 1200 cfm. @ 11 oz. 7 x 7 outlet, 9½ inlet, with 7½ HP, 220 volt 3 ph., 60 cycle, 1750 RPM motors.

CENTRIFUGAL COMPRESSORS

400 CFM. 1802 Spencer Turbo Compressor. 1250 cfm. @ 3¼ lbs. Gen. Elec. with 30 HP. 220/440 volt, 3 phase 60 cycle 3600 RPM motor.
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Centrifugals for gas and oil burning.
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CLASSIFIED

Accounts Wanted

MANUFACTURER'S ACCOUNT WANTED BY established sales and service engineer with wide acquaintance war production plants greater Chicago market. 15 years experience selling and servicing industrial equipment. Age 46. Excellent references. Address Box 823, STEEL, Penton Bldg., Cleveland.

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SALARIED POSITIONS—This advertising service of 33 years' recognized standing negotiates for high salaried supervisory, technical and executive positions. Procedure will be individualized to your personal requirements and will not conflict with Manpower Commission. Retaining fee protected by refund provision. Send for details. R. W. BIXBY, Inc., 110 Delward Bldg., Buffalo, N. Y.

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All classifications other than "Positions Wanted," set solid, minimum 50 words, 5.00, each additional word .10; all capitals, minimum 50 words, 6.50, each additional word .13; all capitals, leaded, minimum 50 words 7.50, each additional word .15. "Positions Wanted," set solid, minimum 25 words 1.25, each additional word .05; all capitals, minimum 25 words 1.75, each additional word .07; all capitals, leaded, minimum 25 words 2.50, each additional word .10. Keyed address takes seven words. Cash with order necessary on "Positions Wanted" advertisements. Replies forwarded without charge.

Displayed classified rates on request.

Address your copy and instructions to STEEL, Penton Bldg., Cleveland.

Bids Wanted

STEEL Adv—NO. 981 1-4 Garman 6 PT EMERGENCY OPERATIONS UNIT, PUBLIC Buildings Administration, Federal Works Agency, Washington, D. C., December 29, 1942.—Sealed proposals in duplicate will be publicly opened in this office at 10 a.m., Jan. 19, 1943, for the construction of fire station at Sidney, N. Y. Upon application, one set of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Commissioner, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any subcontractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Commissioner of Public Buildings, Federal Works Agency.

Positions Wanted

ELECTRIC FURNACE MELTING SUPERINtendent-Metallurgist. 15 years operating and metallurgical control. Experienced all grades including stainless. Qualified to install, train, and control operations. Reply Box 824, STEEL, Penton Bldg., Cleveland.

EXECUTIVE, AVAILABLE IN NEAR FUTURE, young, efficient and draft exempt. Very versatile, especially valuable to small or medium size concern. Adddress Box 821, STEEL, Penton Bldg., Cleveland.

Help Wanted

MASTER MECHANIC WANTED

Thoroughly experienced electrical and mechanical maintenance man to take complete charge of general maintenance of open-top electric furnace plant producing ferro alloys. Location Charleston, South Carolina. Must be capable, reliable and with acceptable references. This is an excellent opportunity for the right man. Address Pittsburgh Metallurgical Company, Inc., general offices Niagara Falls, New York.

WANTED FOR WEST COAST STEEL MILL

Immediately

EXPERIENCED ELECTRIC FURNACE MELTERS AND HELPERS

EXPERIENCED ROLLERS AND HELPERS

METALLURGISTS

EXPERIENCED AND QUALIFIED MEN TO TAKE CHARGE OF ELECTRIC FURNACE SHOP PRODUCING 60 to 75 THOUSAND TONS OF CARBON AND ALLOY INGOTS PER YEAR.

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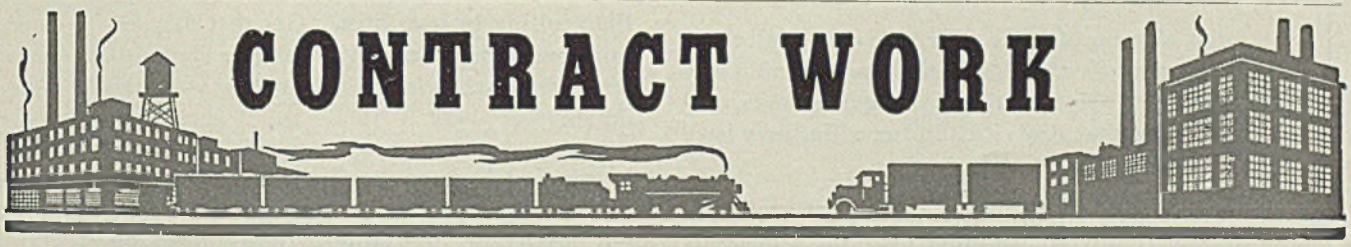

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designers and builders of wire and ribbon stock forming machines.

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FOR VICTORY TODAY AND SOUND BUSINESS TOMORROW

Get This Flag Flying Now!

This War Savings Flag which flies today over companies, large and small, all across the land means *business.* It means, first, that 10% of the company's gross pay roll is being invested in War Bonds by the workers voluntarily.

It also means that the employees of all these companies are doing their part for Victory . . . by helping to buy the guns, tanks, and planes that America and her allies *must* have to win.

It means that billions of dollars are being diverted from "bidding" for the constantly shrinking stock of goods available, thus putting a brake on inflation. And it means that billions of dollars will be held in readiness for post-war readjustment.

Think what 10% of the national income, saved in War Bonds now, month after month, can buy when the war ends!

For Victory today . . . and prosperity *tomorrow,* keep the War Bond Pay-roll Savings Plan rolling in *your* firm. Get that flag flying now! Your State War Savings Staff Administrator will gladly explain how you may do so.

If your firm has not already installed the Payroll Savings Plan, *now is the time to do so.* For full details, plus samples of result-getting literature and promotional helps, write or wire: War Savings Staff, Section F, Treasury Department, 709 Twelfth Street NW., Washington, D. C.

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STEEL

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Where-To-Buy Products Index carried quarterly.

(Continued on next page)

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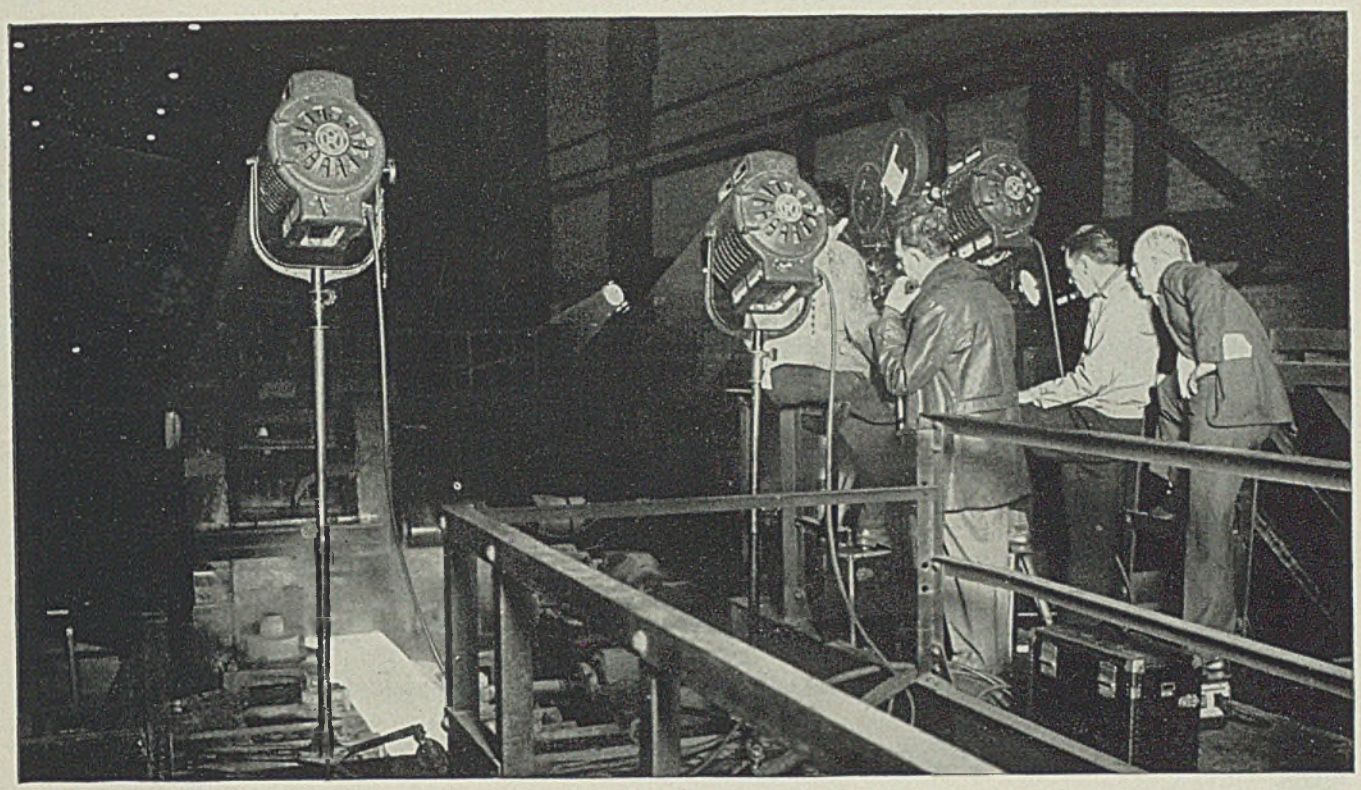


New Motion Pictures for Users of Steel

AVAILABLE WITHOUT CHARGE FOR GOVERNMENT USE, AIRPLANE PLANTS, TANK FACTORIES, TRAINING CLASSES AND ALL MAKERS OF COMBAT MATERIALS

Bethlehem Steel Company has just completed two motion pictures designed to assist metallurgists, producers and learners in plants making war materials.

The films have been planned, photographed, and edited under the supervision of leading technical men of the company.

The purpose of the films is to facilitate the efficient handling of steel in its conversion to war-time products.

The films, while simplified as much as possible for the comprehension of the learner, are not designed primarily for entertainment or popular educational value. Hence response to requests from general groups such as luncheon clubs and similar bodies, must be deferred pending our meeting requests from war plants and training schools.

WHAT THE PICTURES SHOW

The pictures are on 16 mm. film, with sound-track, each running for about 40 minutes. The subject matter includes the following:

STEEL FOR THE ARMED FORCES
PART 1
HOW STEEL IS MADE

Blast furnace, bessemer furnace and open-hearth operations.

Animated drawings of what takes place in the blast furnace and open-hearth.

Control of slag in the open-hearth.

Spectrographic analysis.

Still cross-sections of bessemer furnace, electric furnace, and cupola furnace in the foundry.

Standard rolling operations.

Hammer forges and press forges.

Iron and steel foundry.

STEEL FOR THE ARMED FORCES
PART 2
STEEL TREATING AND TESTING

Wire drawing.

Special testing procedures.

Close-ups of inspectors at work.

Preparation of steel for re-rolling.

Animated time-temperature charts showing heat treating sequences.

Standard spark testing procedure.

Stop motion photographs of sparks held at the characteristic point to indicate presence of various alloys.

PROMPT REQUESTS SOLICITED

We shall make as many prints as necessary to supply promptly the requests from war producing and training groups. To lower our costs, any such groups are asked to apply for showings promptly so that we may estimate the number of prints which may be needed.

We also have a film library of special-product pictures such as the making of wire rope. Typical groups before which Bethlehem films have been shown in the past year:

Vought-Sikorsky Aircraft Corporation
Union Carbide and Carbon Company
Fleet Service Schools, Norfolk, Va.
San Antonio Air Depot
Springfield Armory
Watervliet Arsenal
Princeton University
Henry Ford Trade School
Purdue University
Inspectors School of Naval Material
Pennsylvania State College
University of Pennsylvania
General Motors Institute
Rensselaer Polytechnic Institute
Frankford Arsenal
Cleveland Ordnance District
University of British Columbia
Virginia Military Institute
Springfield, Ohio, Foremen's Club
Foster Wheeler Corporation
Sun Oil Company

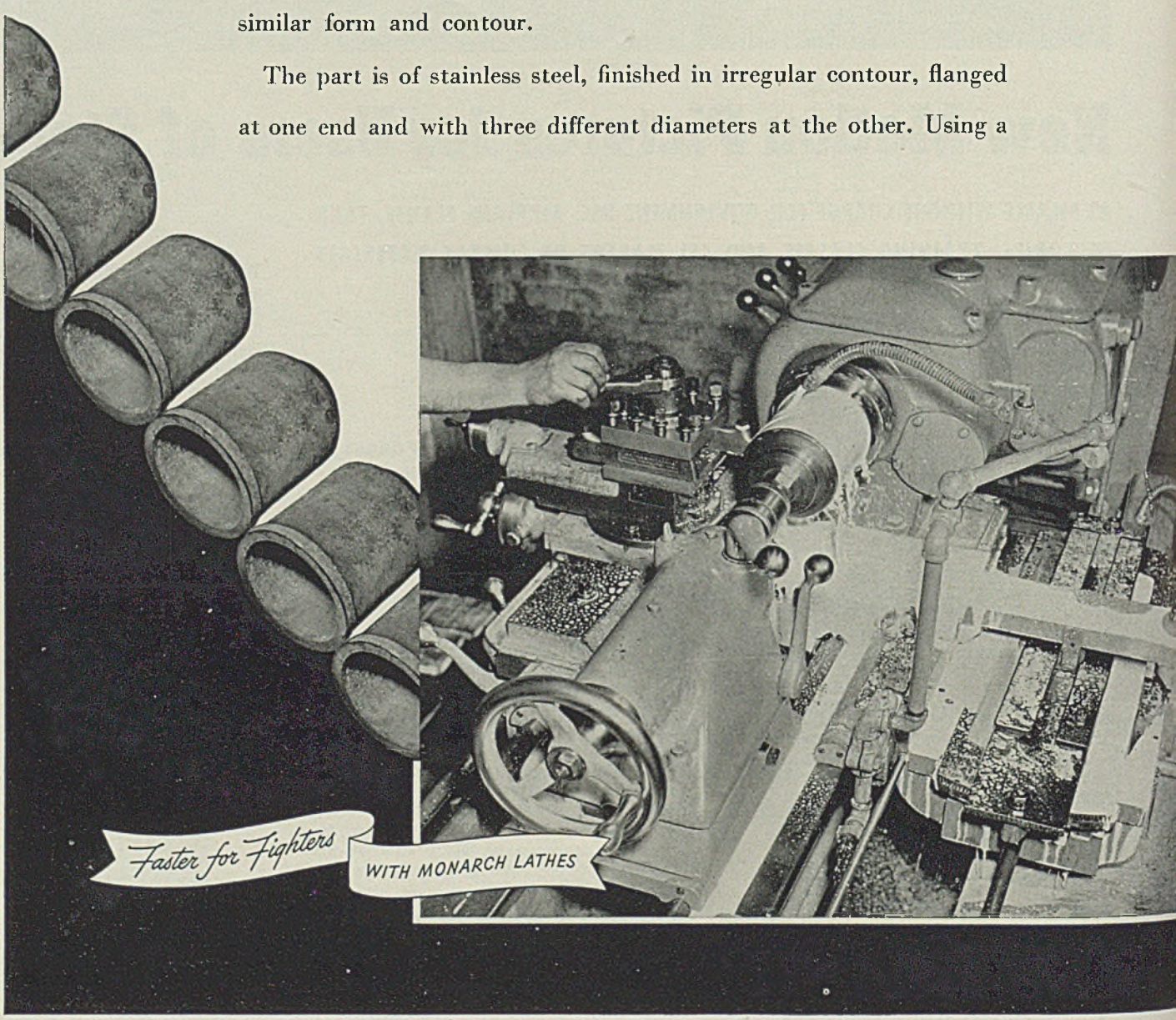
BETHLEHEM STEEL

HOW TO ORDER—*If you represent a war material plant or training group kindly write stating position, name of group, dates you desire the films and optional dates. State length of time you desire to hold prints. There are no charges except return expressage. Address Motion Picture Office, Room 841, Bethlehem Steel Company, Bethlehem, Pa.*

Keep 'em rolling faster

The method used by this producer of war equipment to finish a starter cylinder may be helpful to other manufacturers faced with the necessity for faster and more accurate production of parts of similar form and contour.

The part is of stainless steel, finished in irregular contour, flanged at one end and with three different diameters at the other. Using a



WITH MONARCH FORMING ATTACHMENT

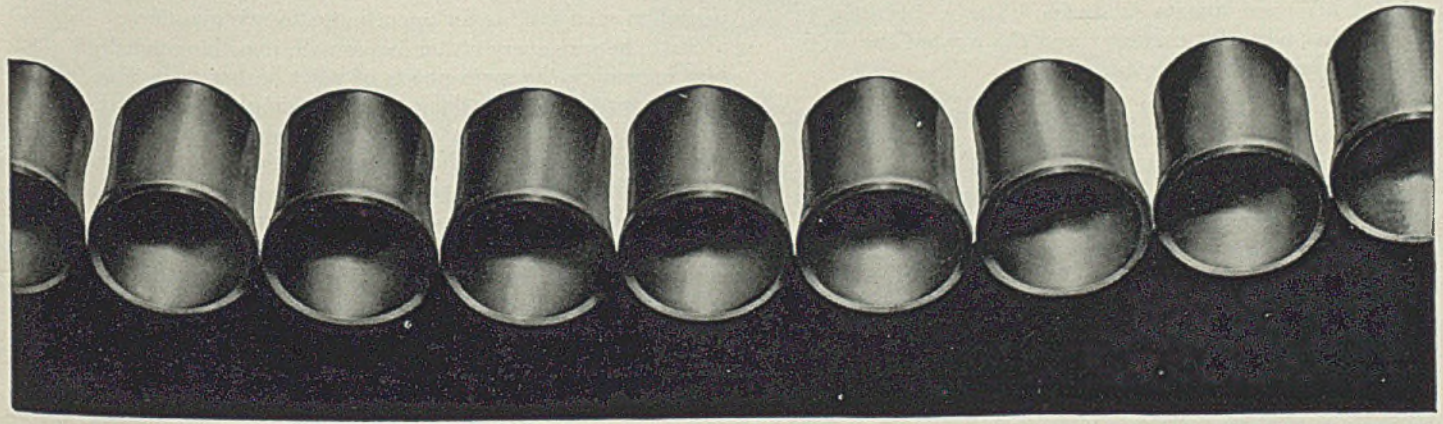
Monarch Lathe equipped with mechanical profile or forming attachment, the job is finish-turned completely in one setup. A double track cam guides the roller follower and reproduces the form on the work. Accuracy of form, providing perfect interchangeability of cylinders, is a basic requirement. This is being accomplished on a production basis with this Monarch equipment.

In war plants throughout the country, Monarch Lathes are producing with speed and accuracy literally millions of parts for our Victory program . . . are helping to deliver planes and tanks and ships and guns . . . *faster for fighters.*

THE MONARCH MACHINE TOOL COMPANY · · · SIDNEY · OHIO

MONARCH LATHES

COVER THE TURNING FIELD



BEHIND THE SCENES

Women In War Work

■ For the past several months, even before the problem of using women in war work took on the proportions it has today, the editors of STEEL have been running some of the most informative articles in the country. E. F. Reinhart, president, Republic Drill & Tool Co., Chicago, writes:

Of the several articles which have appeared during recent months in various trade papers, concerning the employment of women in our plant, yours is unquestionably the best. It is exceptionally well written and is fully descriptive of the effort we have made to successfully employ women in war production.

Yearbook Issue Assays High

■ STEEL's January 4 "Yearbook of Industry" issue has brought to our desk a very healthy pile of commending letters, commenting on every phase of the tremendous job. Of them all, however, we like the one from E. W. Weaver, Consulting Engineer, Towmotor Co., Cleveland:

In the forty years or so of perusing trade and professional publications, I have acquired some appreciation for those of high character.

I want to compliment you on the exceptional high assay of information in your January 4 issue of STEEL.

To Help Win the War

■ And inasmuch as we seem to be reading all the mail today you'll no doubt get a kick, as we did, out of this note from Karl L. Landgrebe, a few weeks ago appointed vice president of Goslin-Birmingham Manufacturing Co., Birmingham, Ala.

Thanks for mentioning my appointment in STEEL. I am very happy to stay in the "harness" for the duration and all of us old fellows who are in good health, should be doing something to help win the war as quickly as we can.

Offensive Weapons

■ Steel, oil, and other critical materials aren't the only things needed for the African campaign. We see by the paper where sixty thousand diapers were included in the American equipment landed by our invading forces. But, lest you get unduly excited they will be used as gifts for natives who'll make turbans out of them.

OPA Expert

■ Even the soda jerker must be up on his OPA regulations these days, as the following conversation overheard in a capital drugstore well proves. A girl ordered a minced ham and tomato sandwich. The s. j. started to comply, but when his customer said she wanted the sandwich to take out, he objected.

"I can serve you minced ham and tomato if you eat it here, but if you take it out you can't have the tomato. It's against OPA rules," he explained. "We raised the price of that combination sandwich recently, which is permitted by OPA so long as it's eaten on the premises. But when we sell something the customer takes with him we must adhere to the March price ceiling. How about taking plain minced ham; its price is unchanged?"

The Editors' Roundtable

Geo. W. Birdsall, Engineering Editor

■ Every once in a while an editor is invited to attend a demonstration of a new machine, process or production method. It is amazing to see the expense to which some companies go yet fail to put across their message. Others do a really effective job and at less expense due to better planning. Of course, some companies may put on such a demonstration perhaps only once in ten years and so have little experience to draw upon.

From personal observation, I would sincerely recommend the following to a company planning any sort of demonstration: First, have a single executive plan the entire program and make all arrangements.

Second, plan to have an engineer or someone thoroughly familiar with the equipment or process explain to the gathering before the demonstration just what they will see; the purpose and main advantages of the machine or process. Enough detail should be given so the visitor will have an idea of what it is all about and the principal advantages or features to observe during the demonstration. If a large gathering, use a good public address system. Keep this portion of the program short. It should not take more than a half hour.

Third, plan the actual demonstration carefully. Make it dramatic. Have plenty of action. Furnish every visitor with a printed or mimeographed copy of the program if more than a single simple operation is involved. On this program, have a time schedule for the various events and keep to it. Do not let the demonstration run longer than an hour or interest will lag. Have ample light on the demonstration. Be sure all visitors are placed to see the action clearly. Have your demonstrator use a public address system if more than a small gathering so everyone present can be sure to hear his explanation of each step as the action occurs.

Fourth, have your demonstration carefully rehearsed so it will go off smoothly. Nothing makes a poorer impression on a visitor than an obviously unrehearsed and faltering performance. Every visitor should receive the impression that these people know what they are doing and are experts at it.

Fifth, after the demonstration, provide a discussion period to give visitors an opportunity to ask questions.

Sixth, be sure every visitor leaves with something to help him remember the main points of what he has seen. This written matter may be long or short, simple or detailed, in printed booklet form or on a single mimeographed sheet—but be sure he has something that carries your message when he goes home.

These appear to be the essential elements of the most effective presentations. Following these suggestions need not involve much expense, and they are certain to improve the impression visitors will carry away with them.

Vol. 112, No. 3, January 18, 1943, issue of STEEL, published every Monday at Cleveland, Ohio. Entered as second class matter at the post office, Cleveland, O., under act of March 3, 1879. U. S. and possessions, Canada, Mexico, Cuba, Central and South America, 1 year $6; 2 years $10; all other countries, 1 year $12. Current issues, 25c. Yearbook of Industry issue, $2.00.

Editorial Contents—Page 17

One New Ramix Bottom..Six More Destroyers

LAST JUNE a Ramix bottom was installed in a 130-ton open hearth. It replaced an old magnesite-and-slag hearth installed in 1926.

Complete records are available on both bottoms—so it is possible to compare accurately the cost of these two types of hearths. Refiguring the magnesite-and-slag job at June 1942 material, labor and fuel rates, the use of Ramix saved this company $1,267.81 in out-of-pocket expense.

But more important to a shop engaged in war production is the time saving. The Ramix hearth took only 120 hours to build, heat up and make ready to charge the first heat, compared to 397 hours for the conventional burned-in hearth. At $60 an hour, the value of this time saving is $16,620—a total dollar saving of $17,887.81, thanks to Ramix.

More vital still, in the 277 hours of time saved, the furnace made 3,047 tons of prime steel. That's enough extra steel to build six more destroyers to help our boys win back the Solomons—or a hundred tanks to win the fight for Tunis.

Basic Service Engineers are always glad to help any steel manufacturer install Ramix hearths, make major repairs, or assist in solving any problem involving the use of basic grain refractories.

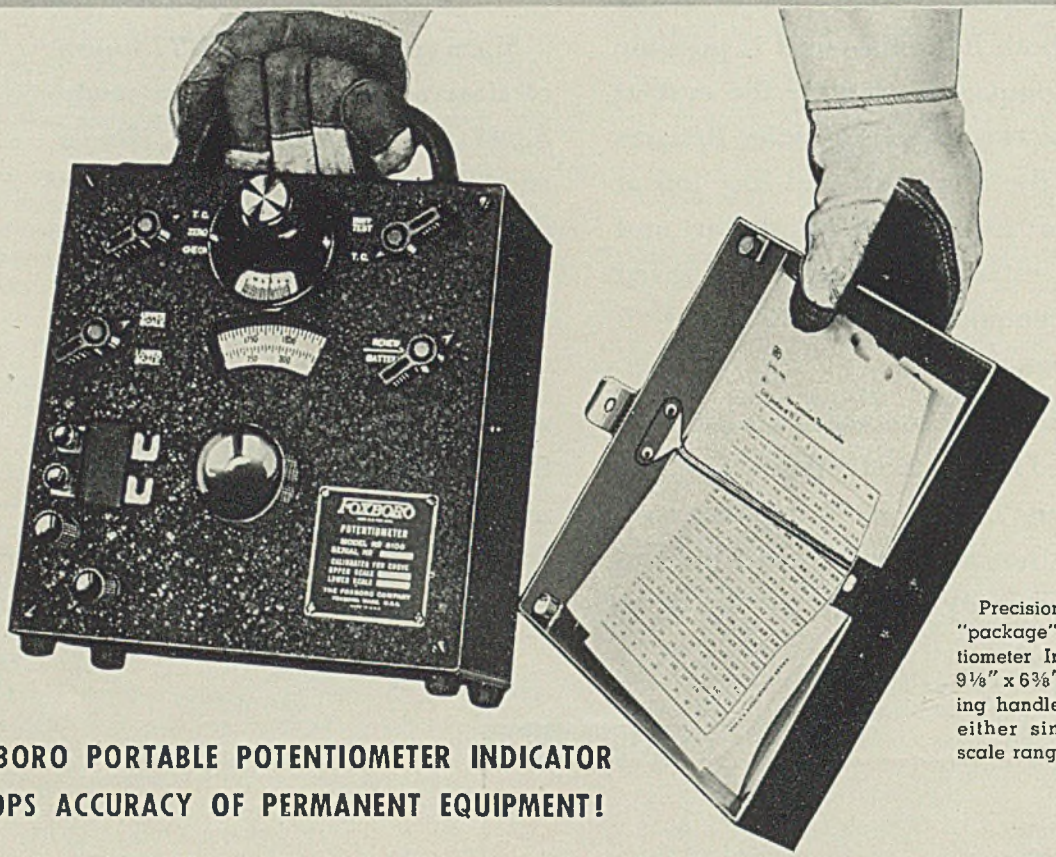
BASIC REFRACTORIES, INCORPORATED

843 HANNA BUILDING ● CLEVELAND, OHIO

Ramix is manufactured in Canada, for sale outside U. S. A. and Mexico, by Canadian Refractories Limited, Montreal

Here's Pyrometer Precision

"On-the Hoof!"



Precision in a compact "package"! Foxboro Potentiometer Indicator is only 9⅛" x 6⅜" x 12½" (including handle). Available in either single or double scale range.

FOXBORO PORTABLE POTENTIOMETER INDICATOR TOPS ACCURACY OF PERMANENT EQUIPMENT!

NO matter where you need close check-ups on temperatures, you can hustle a Foxboro Portable Potentiometer Indicator into place and get reliable data immediately!

This sturdy, compact portable pyrometer weighs only 14½ lbs., yet gives all the accuracy of a top-notch permanent instrument. For checking thermocouples and service equipment . . . for experimental temperature testing or as a spare in case of accidents to regular instruments . . . it's practically an essential in any plant using pyrometric instruments.

Foxboro Portable Potentiometer Indicators employ the same high-fidelity measuring system as the fixed-service Foxboro Potentiometer Indicators. The accuracy of the potentiometer circuit is unaffected by the resistance of any ordinary thermocouple circuit to which it may be connected. The 17-inch-long temperature scale provides instant, accurate reading and setting. Vernier dial gives quick precision balancing.

Write for Bulletin A-305 containing full details of this and other precision Foxboro Potentiometer Indicators. **The Foxboro Company, 118 Neponset Ave., Foxboro, Mass., U. S. A.** Branch offices in principal cities of the United States and Canada.

Potentiometer Instruments by FOXBORO

Reg. U. S. Pat. Off.

VITAL CASTINGS

PRODUCED CENTRIFUGALLY by SHENANGO-PENN

Bearings • Bushings • Pump and Cylinder Liners
Rings • Propeller Shaft Sleeves • Washers

Centrifugal casting is a process that assures castings of greater strength . . . castings that deliver long trouble-free service. Sizes range from 2" diameter bearings to 26-inch by 26-foot long propeller shaft sleeves, and for contractors in war industries, our complete machining facilities are an added advantage.

Write for these bulletins today. They describe our products, alloys and facilities in complete detail.

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ALL BRONZES
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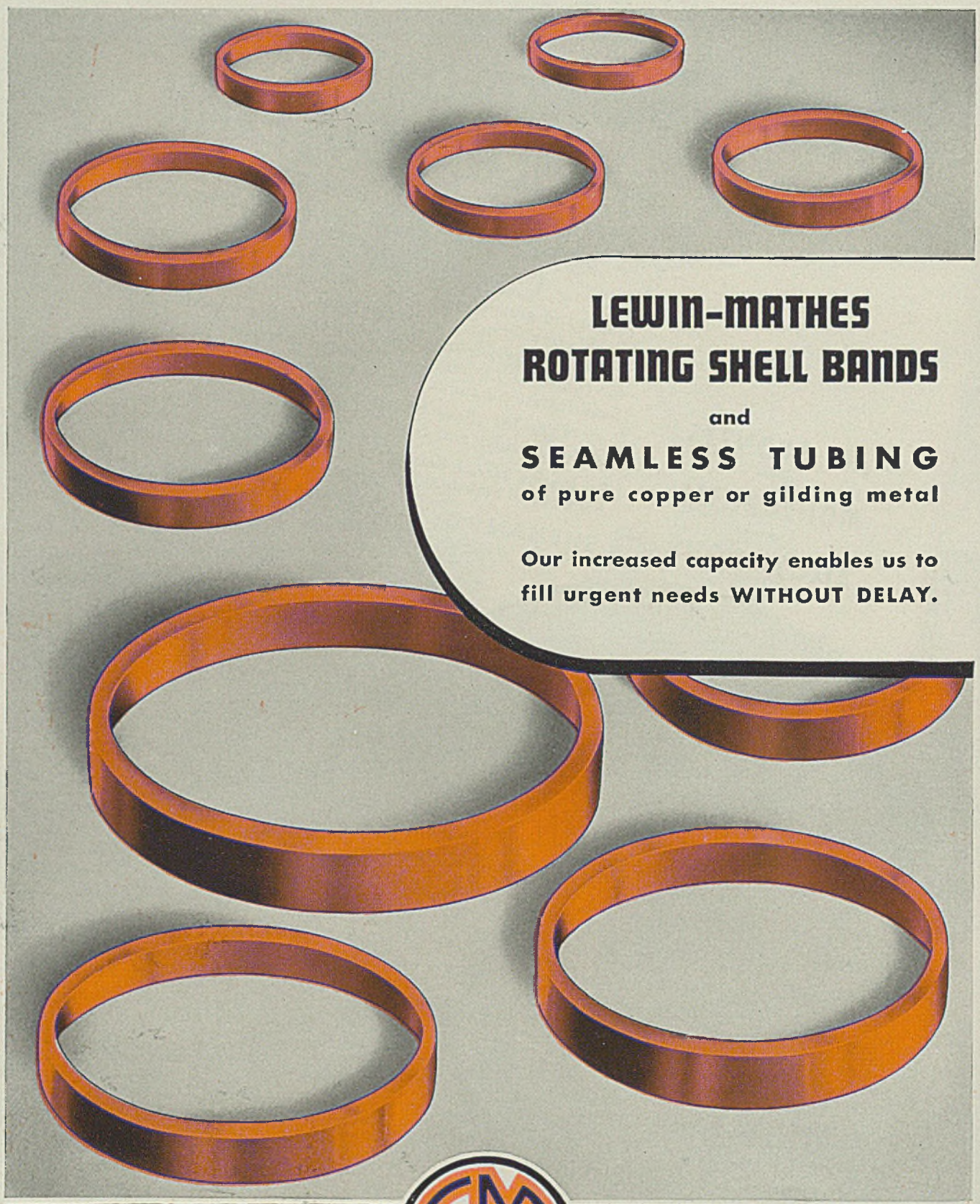
MONEL METAL
—
ALLOY IRONS

SHENANGO-PENN MOLD COMPANY
405 WEST THIRD STREET · DOVER, OHIO
Executive Offices: PITTSBURGH, PA.

SHENANGO-PENN MOLD COMPANY



LEWIN-MATHES ROTATING SHELL BANDS

and

SEAMLESS TUBING

of pure copper or gilding metal

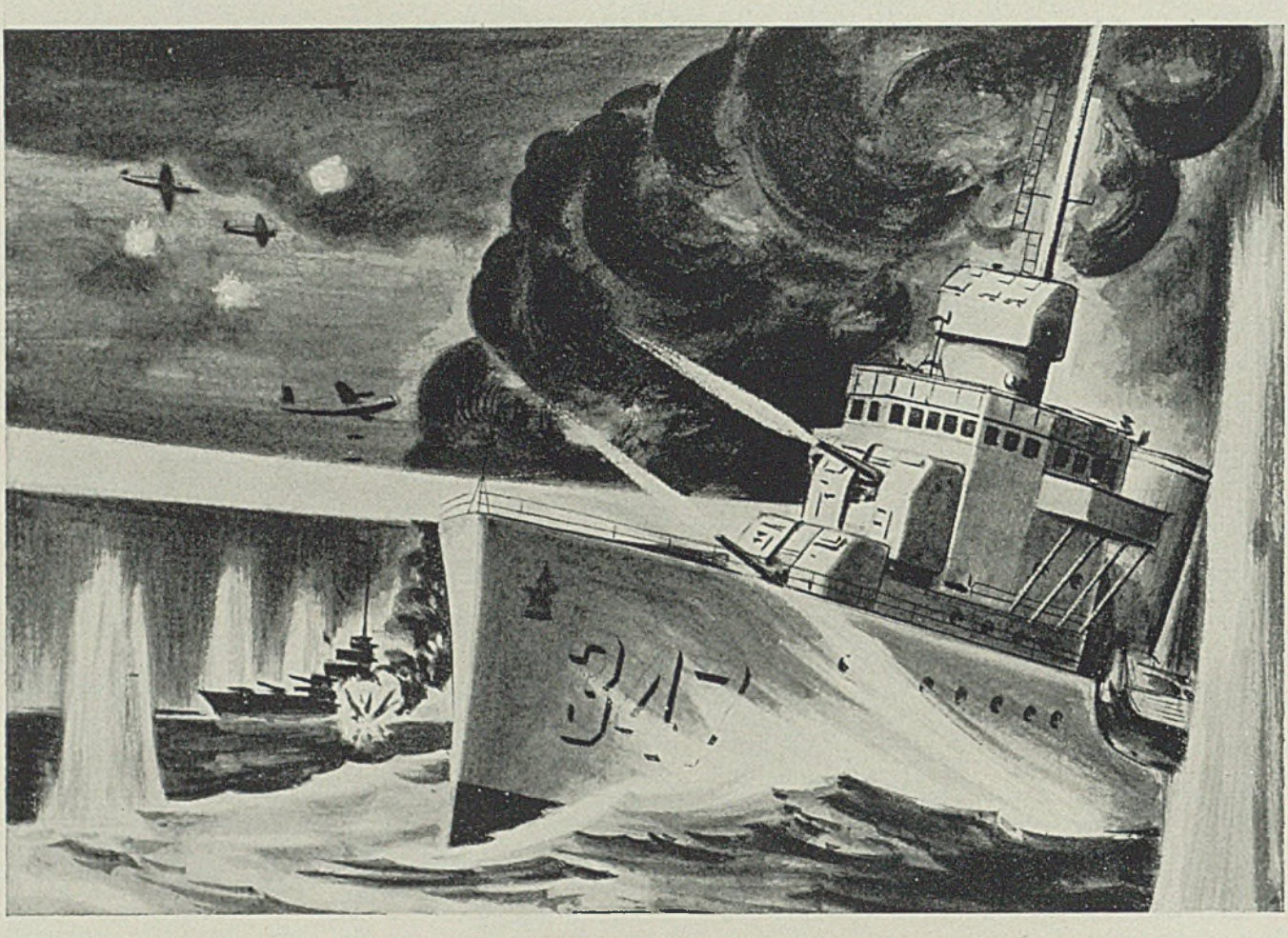
Our increased capacity enables us to fill urgent needs WITHOUT DELAY.

LEWIN MATHES

LEWIN-MATHES COMPANY • • SAINT LOUIS, MISSOURI

VICTORY will be won

with alloy steel



and N-A-X 9100 Series

SAVES VITAL ALLOYING ELEMENTS

Successfully used in hundreds of exacting peace-time products and parts, N-A-X 9100 Series of Alloy Steels aids war equipment production by conserving strategic alloying elements—without impairing quality.

N-A-X 9100 Series is being used as (1) a High Tensile Grade; (2) a Medium and Deep Hardening Carburizing Grade; (3) a Medium and Deep Hardening Constructional Grade. A truly remarkable achievement of Great Lakes engineers and metallurgists, the versatile N-A-X 9100 Series is readily adaptable in the manufacture of most armament appliances, either "as rolled" or heat treated.

Basically a low-alloy steel, with vital alloying elements held to an absolute minimum, N-A-X 9100 Series is supplied in two general grades—with and without molybdenum, all other components of the analysis being held constant. With deep hardening characteristics greater than or equal to the higher alloyed steels, no sacrifice of toughness or machinability is made.

GREAT LAKES STEEL CORPORATION

Detroit, Michigan

Sales Offices in Principal Cities

NATIONAL STEEL

Division of

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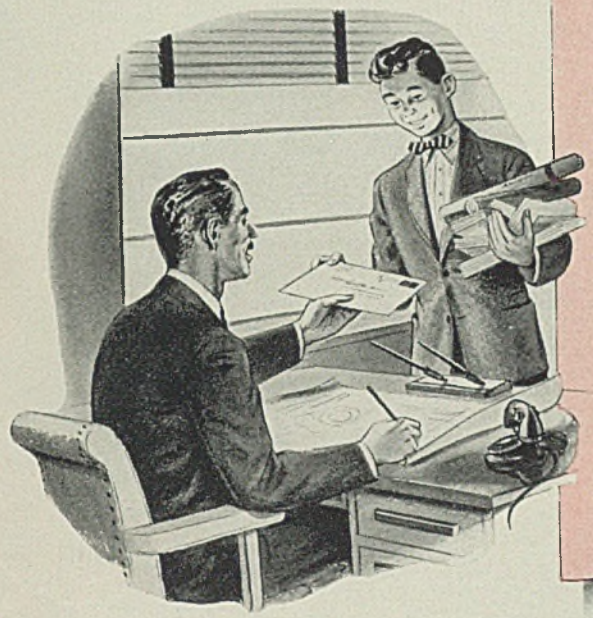
SCRAP IS VITAL TO STEEL PRODUCTION . . . GET YOURS IN FOR VICTORY!

be the

KNOW man

on **TESTING** in

your plant



- ☐ *Bulletin 161*—Southwark-Tate-Emery Testing Machines
- ☐ *Bulletin 162*—Stress-Strain Recording
- ☐ *Bulletin 164*—SR-4 Strain Gage
- ☐ *Bulletin 165*—SR-4 Torquemeter
- ☐ *Bulletin 169*—SR-4 Portable Strain Indicator
- ☐ *Bulletin 170*—SR-4 Strain Recorder
- ☐ *Bulletin 153*—Strain Gages and Extensometers
- ☐ *Bulletin 166*—Porter-Lipp Strain Gage
- ☐ *Bulletin 167*—Whittemore Strain Gage
- ☐ *Bulletin 134*—R. R. Moore Fatigue Testing Machine
- ☐ *Bulletin 109*—Norton Damping Capacity Testing Machine
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...this literature will give you the facts!

Today plants are required to work with materials which they have never used before. In some cases, entirely new production facilities are being installed. Production men are faced with unfamiliar specifications. Production must be fast, and finished equipment has to be right. Time is not available for experimentation.

Are you faced with a situation like this? If you are, and if the matter of *testing* routines and the specific testing equipment to do the job are problems, you can take the first step toward solving them by sending for this helpful Baldwin Southwark literature.

Already in widespread use throughout the country, Baldwin Southwark testing machines and instruments are simple to operate, versatile in application, and offer unsurpassed sensitivity and accuracy. There is Baldwin Southwark testing equipment for your specific job of testing. Know about it now. Write for this literature today.

BLW THE BALDWIN GROUP

BALDWIN SOUTHWARK

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POWER -packaged for Victory

DEADLY in its compact power—this carrier-based plane provides the sting that makes great naval air victories possible.

"A motor with wings," it has been aptly termed, for a single engine of more than 2,000 horsepower roars this mighty ship to Victory.

Engines of such tremendous horsepower are possible because of new techniques in engineering and manufacture, not the least of which have been the advances made in the Foote Bros. Gears that power them. For an engine of this size—swinging propellers at high speed offers problems in gear design and manufacture that, until a few months ago, might well have been considered unsolvable.

How well these problems were solved is evidenced by the flow of Pratt & Whitney engines rolling off production lines in huge engine plants throughout the country. The extreme precision of the gears is a tribute to the engineering back of them, but even more to the new methods of manufacture that have made their mass production possible.

When the war is won these gears, produced in the Precision Gear Plant of Foote Bros., can be applied to peacetime engines and peacetime machines. Manufacturers are then assured of a new era in the transmission of power through gears and speed reducers—an era of more compact, more efficient machines.

FOOTE BROS. GEAR AND MACHINE CORPORATION
5301 South Western Boulevard • Chicago, Illinois

FOOTE BROS.

Better Power Transmission Through Better Gears

These QUICK FACTS about

Meehanite

may help you solve today's design and production problems

WHAT IS MEEHANITE?

MEEHANITE is a special metal for castings which combines the better features of both cast iron and steel. Meehanite castings offer the engineer reliable and favorable design characteristics as described below.

TYPES

There are twenty-one types of Meehanite, each having a different combination of physical properties aimed toward meeting definite service requirements.

PHYSICAL PROPERTIES

Varying with the requirements of the service, Meehanite in its several types (as cast) produces tensile strengths up to 55,000 lb. p.s.i.; compressive strengths up to 200,000 lb. p.s.i.; moduli of rupture in bending from 61,000 to 93,000 lb. p.s.i. These and other properties such as yield point, modulus of elasticity, hardness, torsonial and shear strength, fatigue strength, etc., are known and reliable.

HEAT TREATMENT

For higher strength and hardness, Meehanite is adaptable to heat-treatment and flame hardening. Accurate information is available on these subjects, as well as on the effect of elevated temperatures (50°F. to 1100°F.) on strength, creep, surface metal loss.

MACHINABILITY

Machinability rating tests prove Meehanite more machinable than steel or alloy iron castings. This important advantage of Meehanite is due to two factors, (a) the constitution of the metal frequently permits substantially increased machining speeds, (b) dimensional accuracy and smooth cast surfaces mean less metal need be removed in finishing.

VIBRATION DAMPING

A unique combination of high damping capacity and high strength gives Meehanite castings a prominent position in the construction of precision machinery, and in highly stressed machinery parts where weight, noise and possibility of fatigue failure must be kept to the minimum.

WEAR RESISTANCE

Five types of wear-resisting Meehanite offer different combinations of physical properties to meet external problems encountered in wear-resisting service such as: hardness, impact, fatigue, friction, corrosion, lubrication, etc.

HEAT AND CORROSION RESISTANCE

Where heat and corrosion resistance combined with high strength, toughness, etc., are desired, Meehanite is available in types to resist growth, scaling, warpage, and corrosion.

ENGINEERING DATA

Complete data on engineering properties, metallurgy, heat-treatment and manufacture is included in this 47-page book. Sent free to executives, engineers, designers, production and maintenance men of industry. Price to others, $1.00 per copy.

MEEHANITE RESEARCH INSTITUTE, 311 Ross St., Pittsburgh, Pa.

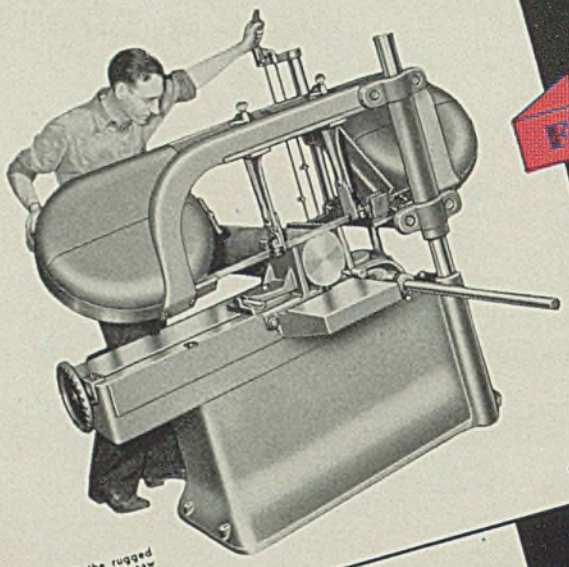
FAST-ACCURATE VERSATILE

WELLS

Continuous Metal Cutting BAND SAWS

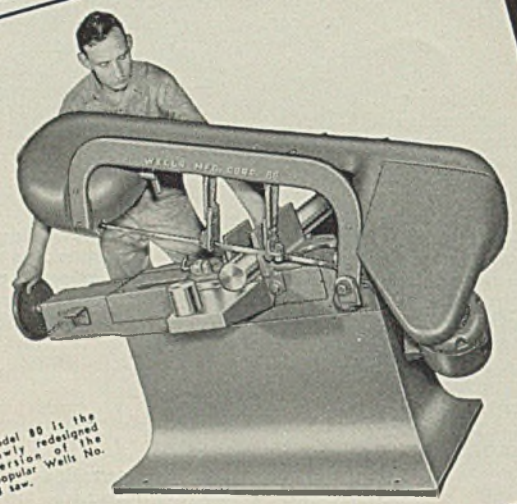
for

PRODUCTION • TOOL ROOM
MAINTENANCE • GENERAL UTILITY



V-12

Wells V-12, the rugged new heavy duty saw which features hydraulically controlled feed and lift.



SERIES 80

Model 80 is the newly redesigned version of the popular Wells No. 8 saw.

WITH Wells Metal Cutting Band Saws you can apply the advantages of continuous cutting action to virtually all kinds of metal cutting jobs. Almost all metals in all shapes are cut quickly and accurately at minimum expense. Designed to provide maximum efficiency for saws of this type, Wells Metal Cutting Band Saws offer you these advantages:

Capacity is the greatest of any saw for the money.

Simplicity is engineered into the machine to give a lifetime of service.

Three speeds of the CORRECT amount of feet per minute assure most efficient cutting and long blade life.

Controlled feed is positive and accurate.

Heavy I beam holds and brings fully adjustable guides close up to the work for accurate cutting.

No coolant required even when cutting tool steels.

Heavy sturdy construction—no vibration.

And a host of other details that mean better metal cutting at lower cost.

Wells Has Established Leadership

WELLS MANUFACTURING CORP., THREE RIVERS, MICH.

Write for complete details

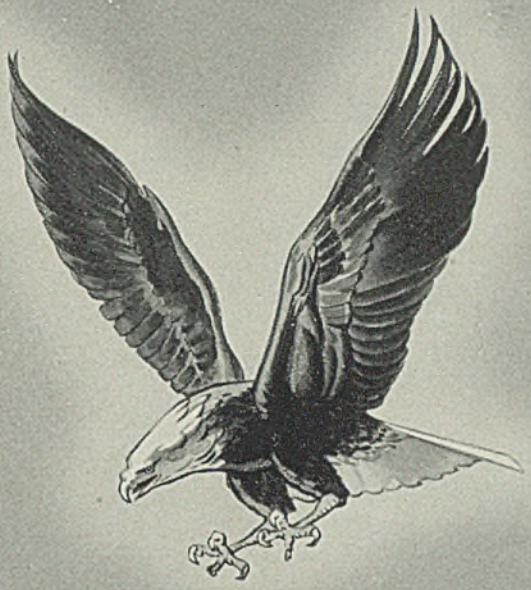
SPECIFICATIONS

SPECIFICATIONS	V-12	No. 80
Capacity: Rectangular	13"x16"	8"x16"
(Special bowed guides)		5"x24"
Rounds	13" dia.	8" dia.
Speeds: Feet per minute	33, 94, 148	60, 90, 130
Motor Size	¾ H.P.	½ H.P.
Swivel Vise	to 45°	to 45°
Blade Size	13' 7¾"x.032"	11' 6"x.031"
Height to top of table	24"	25½"
Width of Bed	12"	10¼"
Drive	"V" Belt	"V" Belt
Floor Space	73"x30"	2'x6'

WELLS MANUFACTURING CORPORATION

Wells METAL CUTTING BAND SAWS

1515 FILLMORE STREET • THREE RIVERS, MICHIGAN

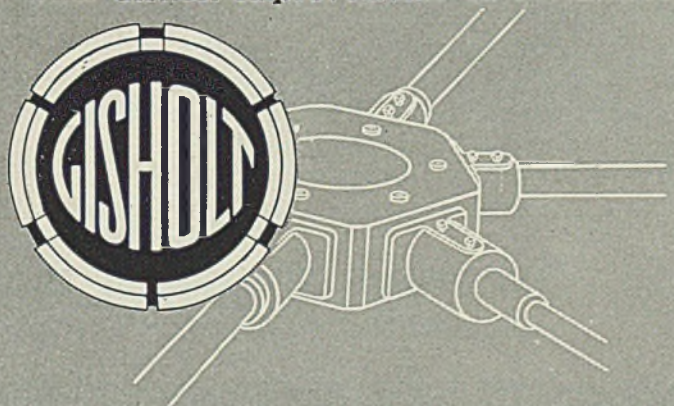


Make it fit to fight!

The American idea of mass production has created a world of interchangeable parts, one dependent upon the other. Wherever it is made—in your plant or in that of a subcontractor, the essence is accuracy. Machine tools like Gisholt Turret Lathes make this possible—assure the precision that makes parts fit to fight. Their proper use is vital to America—and to you.

GISHOLT MACHINE COMPANY • MADISON, WISCONSIN

Look Ahead — Keep Ahead — With Gisholt Improvements in Metal Turning



TURRET LATHES ★ AUTOMATIC LATHES ★ BALANCING MACHINES

So Can the Parts We Cast for Truck Engines

ArmaSteel*

"Through hell and high water" isn't just a phrase to the boys who highball Army trucks on the fighting fronts. They're at the world's toughest proving grounds, not only for men, but for equipment and the parts that go into it.

ArmaSteel parts are taking their share of the punishment on Army trucks, and are coming through with a reputation for rugged durability. To this performance record must be added the production advantages which ArmaSteel castings offer manufacturers of war equipment: exceptional machinability, high hardenability, and the inherent economy of castings in reducing machining time and tool wear.

The fact that ArmaSteel replaces critical steels and alloys is of no less importance than are the desirable characteristics which qualify it for important assignments in industry. ArmaSteel is a good name to keep in mind, both now and in the days of peacetime manufacturing that will follow Victory. *Reg. U. S. Pat. Off.

SAGINAW MALLEABLE IRON DIVISION
General Motors Corporation, Saginaw, Michigan

CAST FOR A LEADING ROLE IN INDUSTRY