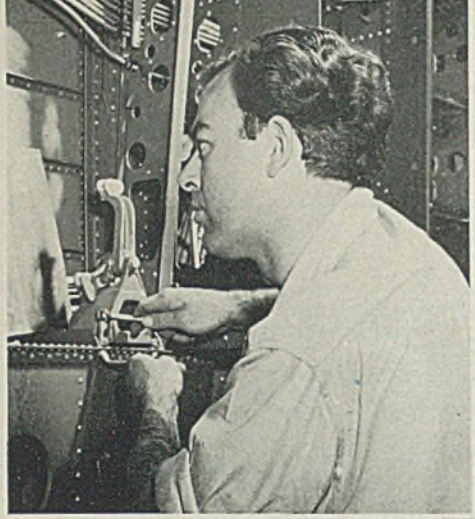

Valuable production short-cut for every metal plant. Page 56.

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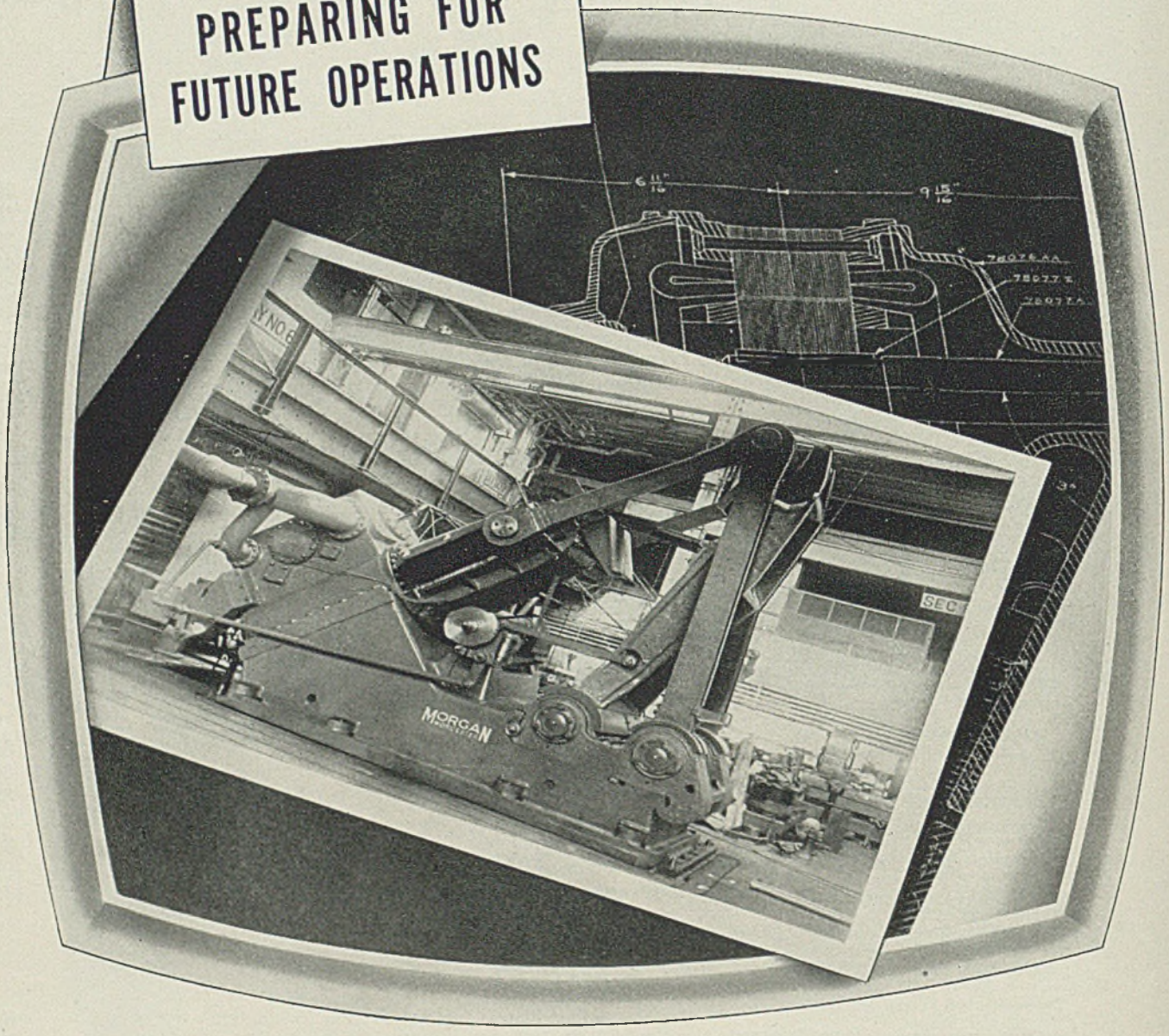

ABOVE is the *world's largest flying shear!* What has that to do with future operations? Just this: Today, America is building the biggest planes, biggest tanks, biggest guns . . . being geared to do things on a gigantic scale. Tomorrow, the skill, experience and facilities that made this shear possible may be able to help you. Consult Morgan for details.

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R-103

HIGHLIGHTING

this issue of STEEL

NEWS That strikers in plants taken over by the Army or Navy find Uncle Sam is not as "easy" as they expected is evidenced by the recent request (p. 22) of workers at the General Cable plant for return to operation under private management. The history of other companies taken over by government agencies after labor disputes had halted war production shows that in no case were the issues causing the disturbance settled while under government control. . . More than 7000 men are working on the huge new airplane-engine plant of the Chrysler Corp. (p. 24) with more than 12,000 to be working on its construction by end of September. Plant will be one of largest in the world, will turn out more potential horsepower monthly than that of Grand Coulee or Boulder Dam.

Much time was saved when Youngstown Sheet & Tube Co. built a blast furnace alongside an old one that was kept operating until the new unit was ready to be moved over onto foundations of the old stack, which was torn down (p. 27).

Investigation by Compliance Branch, War Production Board, discloses tnat no "black market" exists in steel as was claimed recently before the Higgins congressional investigating committee. There was no indication that steel products had been shipped to the Higgins company in violation of WPB orders (p. 37).

War contract readjustments will primarily be a reappraisal of costs (p. 35). OPA Maximum Price Regulation No. 204 establishes ceilings over prices of idle and frozen inventories. An exception permits sale of materials to a government agency under the terms of any government program for purchase of surplus stocks.

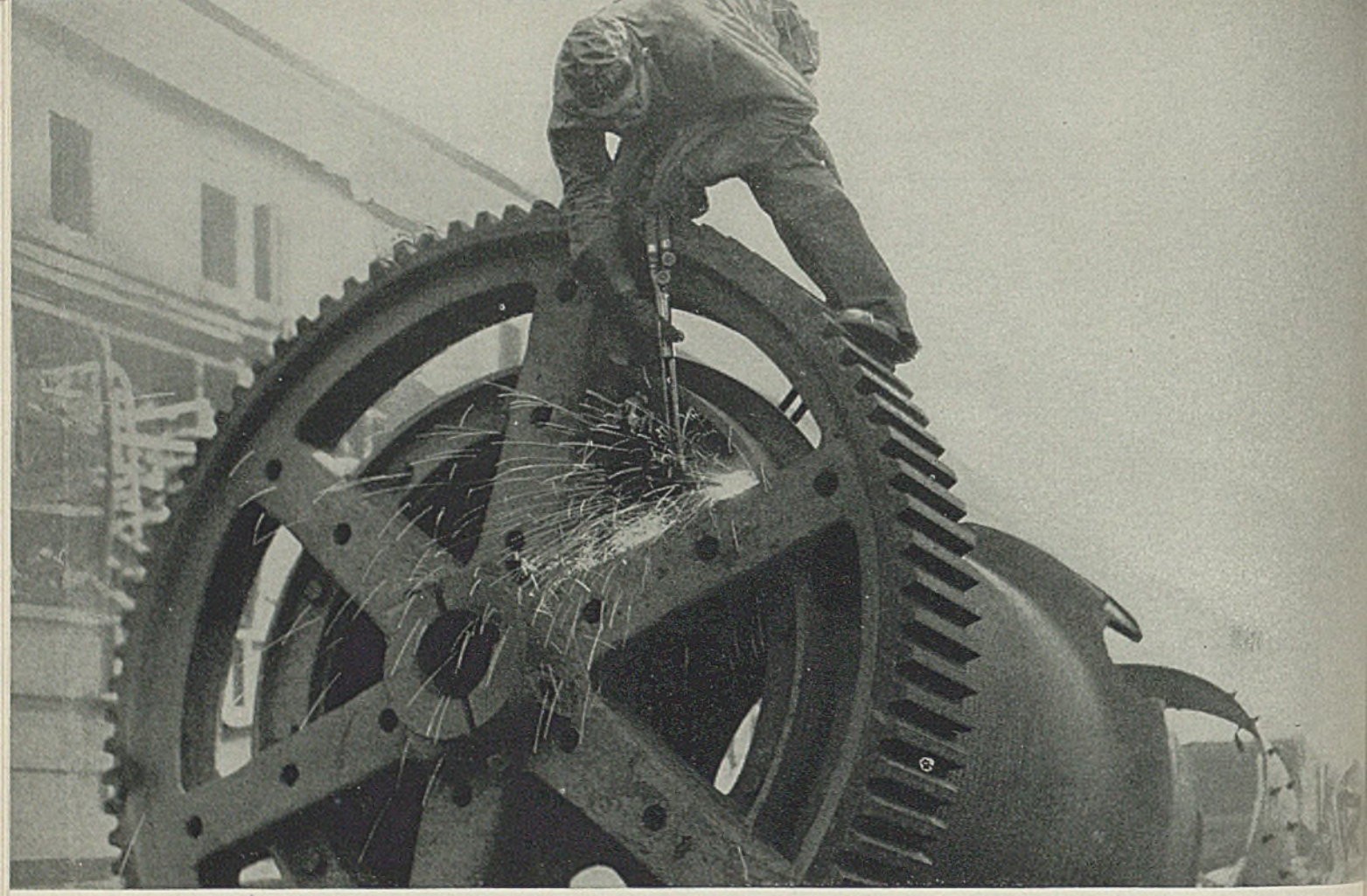
TECHNICAL Professor Macconochie relates (p. 54) the experiences of a porcelain enameling company in getting into war production work. F. M. Blum explains standard crane signals (p. 67) and how their use makes crane operation safer and faster. Low-temperature brazing finds an important application in salvaging alloy cutting tools by brazing on carbon steel shanks to make possible the use of at least 2 inches more of the cutting tool, says W. H. Handrock (p. 73).

"Production illustrations" are comparatively new (p. 56) but appear to offer extremely valuable production shortcuts in every instance where blueprints are ordinarily employed because they are easy to understand by untrained workers, thus enable new men to understand the work to be done better and quicker. At Douglas Aircraft, they reduce assembly time, slash costs and prove valuable to both skilled and unskilled workers.

Development of refrigerated spot welding equipment cuts tip dressing 75 to 90 per cent, increases welding output 300 per cent, ends point pickup, cuts mushrooming. Harold Lawrence also describes how this development (p. 62) enables a thermocouple in the electrode tip to automatically control sequence of current applications to refine grain and temper the spot welds. Hitherto critical steels are brought into the realm of weldability as a result.

PRODUCTION Against a sad picture of industrial Detroit, widely circulated recently, is Detroit's daily output of $13,600,000 worth of war material, a rate 20 per cent greater than the average achieved in the peak of civilian production (p. 39). . . Boeing Aircraft reports production of Flying Fortresses has more than doubled since Pearl Harbor (p. 47). . . Electric power consumption is at a new all-time peak. Latest reports (p. 51) show an increase of 12.9 per cent over like period in 1941. Canadian plants are producing a new and powerful rapid-firing tank machine gun. Increasing production rates in Canada (p. 46) are indicated by production figures for Browning aircraft machine guns. More than half the total produced were made in last three months. Latest machine tool record (p. 25) shows United States' output will probably be double the production of $750,000,000 in 1941.

CONSERVATION Recently revised list of prohibited articles for use in the War Department's $7,500,000,000 construction program is especially severe on copper, rubber, steel, zinc and lead (p. 34). Chromium, magnesium and nickel are virtually barred. Where normally 70,000 tons of copper would be required for this construction work, it appears one-fourth that amount will suffice. Steel plate requirements have been slashed from 202,000 tons to only 48,000 tons by substitution of concrete, wood and sheet steel. In last few months, 2250 tons of cast iron have been saved by use of vitrified china grease traps. To conserve critical materials, WPB has halted further construction on many electric light and power projects (p. 34). . . . Big war order closes 64 contracts with 41 manufacturers for a total 880,000 trucks for the Army. Conservation to wood bodies for many units indicates a saving of 75,000 tons of steel in 1942 and probably 350,000 tons in 1943 (p. 34).



"Gertie" was cut up and fed to the Inland furnaces the day she arrived at the mills.

"Old Gertie" Goes to War

Inland Mine Hoist Makes Scrap for Hungry Furnaces

To help meet the critical need for scrap, an auxiliary mine hoist once affectionately known as "Gertie," was taken out of retirement at one of the Inland ore mines and shipped to the company's mills at Indiana Harbor. The need for scrap is so urgent that "Gertie" was cut up and fed to the hungry Inland furnaces the day she arrived at the mill. She was rolled into steel plates and soon will be part of a Liberty ship carrying vital war supplies to the fighting fronts.

"Gertie" is typical of many pieces of equipment in factories, mines, etc. throughout the country. Replaced by a modern electric hoist several years ago, this old mine hoist was stored because it "might come in handy some day." Holding old machinery, stacks, tanks, tools, jigs, dies, even partly finished parts, for possible future use is a commendable practice in ordinary times. But this is war—*total war*—and everything made of steel, that is not being used to produce for war, ought to be scrapped and started on its way to the steel mills at once.

Many steel mill furnaces are down, while millions of tons of needed scrap remain unreclaimed. The scrap situation is critical now and it will become more critical as winter approaches, unless management of American industry gives authority to scrap old equipment and materials.

If you can't use it *now*—scrap it.

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

Dedicated to Victory

INLAND STEEL CO.

STEEL

August 24, 1942

OUR MATERIALS SHOULD BE USED WISELY

It is to be hoped that the American steel commission now in London will succeed in obtaining agreement on wartime steel metallurgy. There has been considerable complaint among American metallurgists about the British and Russian insistence as to high alloy compositions. It is to be hoped that the commission not only will come to a practical agreement with the British but also with the Russians on the matter of modified metallurgical specifications. The wartime metallurgy must be based not on preferences based on peacetime experience but on the practical basis of fighting the war with the materials we have.

There is another angle on the lend-lease situation which demands attention. That is the insistence of the British on obtaining much auxiliary equipment that is not needed in producing for war. For example, in ordering lathes which well could be stripped of all "extras" and single-purpose tooled for machining shell and other items of ordnance, the British insist on getting complete general purpose tooling, including taper and other attachments. A band-saw manufacturer reports that when the British order his machines they at the same time order enough band-saws to last "40 years."

Naturally, American manufacturers who produce these goods and ship them for export to Great Britain are puzzled over what seems to them to be a waste of productive effort during the war emergency. One of the conclusions which they are minded to consider is that the British, in ordering all the attachments in the catalog, have an eye to the use of this equipment in meeting the world-wide competition after the war. If that is true it would be readily understandable — for it is wise to give some thought to preparation for the enormous task that lies ahead when it becomes necessary to convert an all-out war economy back to the activities of peace.

Undoubtedly it is imperative that some preparations be made now to cushion the shock of the changeover to peacetime economy after the war. But it also must be appreciated that the first must is to win the war. Our strength depends on the wisdom with which we utilize our materials.

E C Kreutzberg

Editor

Strikers Find Uncle Sam Tough Boss; Ask Plant Be Returned to Owners

✦

Government control of war factory short-lived . . . Employes pledge not to interrupt production again "for any reason during the prosecution of the war"

✦

GOVERNMENT seizure and operation of war production plants received another setback last week when employes of General Cable Co., Bayonne, N. J., who struck because the National War Labor Board refused a 10-cent hourly wage increase, requested that the plant be returned to private management.

Told by their labor leader when their plant was seized that their foreman would be "F.D.R." the striking unionists found the federal government was not as easy a boss as they had been led to suppose.

Their case was similar to that of North American Aviation Inc., Inglewood, Calif., Federal Shipbuilding & Dry Dock Co., Kearny, N. J., and other companies taken over by government agencies after labor disputes had halted war production.

In few instances has government control resulted in the settlement of issues causing the disturbance.

Notwithstanding the successive failures of government agencies to operate seized war production plants, the President last week ordered the Army to take over the plant of the S. A. Woods Machine Co., Boston. The company had refused to comply with a War Labor Board order to grant a maintenance of union membership contract to a CIO union and to set up arbitration machinery. Company's attitude toward the government seizure was: "Let the Army try it; we'll co-operate!"

Maintenance of union membership and wage increases almost universally have been the causes for labor disputes resulting in government seizures. Many observers have likened the unions' thrust for "security" as a price for war production to the method by which prohibition was imposed during the first World war.

As "heroes of the assembly line" and supported by the labor board, the unions already have succeeded in winning "union security" in "Little Steel" plants, and in many other metalworking companies.

Where companies have been reluctant to grant the maintenance of union membership clauses in contracts with the unions, the threat of government seizure has been used by the NWLB to force them into line.

Just what connection exists between maintenance of union membership and uninterrupted war production has not yet been made clear by the labor board or other administration spokesmen. Granting of such union security appears to be a "one-way street" to the closed shop arrangement without the voluntary consent of management and many employes.

Handling of labor problems, Washington and industrial observers declare, continues to follow the line of "politics as usual." Agencies established to handle labor problems *apparently* represent all of the three classes of people involved—the working man, the employer and the public. However, the public members are hand-picked "friends of labor," so that no decision involving an employer and a union ever is in doubt. Almost universally, decisions of the labor board have been 8 to 4 votes—with the labor and public members voting together and the employer members dissenting. Another classic example of the careful selection of labor problem panels was the arbitration board which heard the closed shop demand of the United Mine Workers against steel companies owning captive mines. The arbiters: John L. Lewis, head of the union; B. F. Fairless, president of U. S.

Strikers at General Cable Co., Bayonne, N. J., found Uncle Sam a tougher boss than they expected when the Navy seized the plant at Presidential order after production of military supplies had been interrupted by a "wildcat" work stoppage. Rear Admiral Harold G. Bowen, left, placed in charge of the plant, informed the men their demand for a wage increase would not be granted. Above, Admiral Bowen is shown in conference with Dwight G. Palmer, company president, center, and Brig. Gen. R. K. Robertson, right, provost marshal of the Second Service Command

Steel; and Dr. John Steelman, federal labor conciliator. Result: Two to one vote for the closed shop.

Efforts by the unions to extend their power during wartime, naturally has resulted in frequent war production stoppages. In July, according to the labor board, 233,614 man-days of war production were lost by strikes. In June, the loss was 254,653 man-days.

The board reported 198 new strikes during July, compared with 171 in June, but said the number of workers involved dropped from 78,627 to 74,812.

The "wildcat" General Cable Co. strike caused the loss of 88 hours production time at the plant, engaged in building vital supplies for the Navy.

Decision of the strikers to ask for return of the plant to private management followed refusal of the Navy officials in charge to grant pay increases which had earlier been denied by the board.

Rear Admiral Harold G. Bowen, designated by Secretary of the Navy Frank Knox to take charge of the plant, informed workers that the demanded 10-cent hourly increase would not be granted and that any attempt to interfere with operations would constitute "an offense against the United States." He also told the strikers they might lose the 3-cent hourly bonus allowed by the board for night shifts.

Secretary Knox told the strikers that their strike was a dangerous threat to the nation and that seizure by the Navy was not to be construed as an endorsement of their attitude.

Faced with the Navy's determined attitude, the strikers hurriedly and unanimously approved a resolution not to interrupt production again "for any reason during the prosecution of the war." The promise was made, the resolution added, "with the understanding (to which we will dedicate all our efforts) that private operation will be resumed in a manner consistent with the war effort."

United States Steel Balks at Retroactive Wage Increase

United States Steel Corp. representatives last week protested to the National War Labor Board that any wage increase granted to the United Steelworkers of America be retroactive only to Aug. 9, date when the company's contract with the union expires, and not to February, as demanded by the union.

The corporation surprised the union by not offering any resistance to a general wage increase of 5½ cents an hour, as stipulated in the recent labor board directive against four independent steel companies. The union had expected the corporation to offer an increase of 3.2 cents an hour.

Lee Pressman, CIO counsel, and Philip Murray, CIO president, argued the "Little Steel" directive ordering a wage increase retroactive to Feb. 6 should also govern the U. S. Steel case.

John A. Stephans, director of industrial relations for the corporation, said the union's demand for an increase retroactive beyond the date of the expiration of the collective bargaining agreement was a repudiation of its specific contract obligations.

Bethlehem Steel Co. has signed a contract with the United Steelworkers of America, embodying the directions ordered by the NWLB. These include a 44-cent-a-day wage increase retroactive to Feb. 6, checkoff, and maintenance of union membership. Affected are 80,000 employes.

Contract covering wages, hours and working conditions and also specifying that "neither the union nor any employes, individually or collectively, shall cause or take part in any strike, or other interruption or any impeding of production at any plant of the company" has been signed by Republic Steel Corp., Cleveland, and the union.

Agreement provides that any employe or employes who violate the latter section may be discharged by the company.

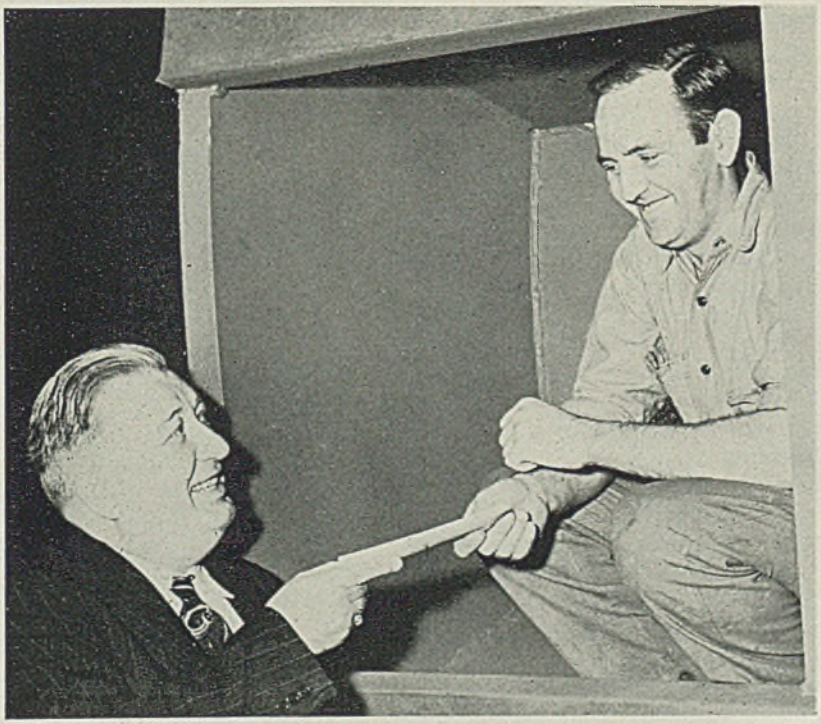
Detroit Local 1299 of the United Steelworkers (CIO), representing employes of Great Lakes Steel Corp., Detroit unit of National Steel Corp., announced successful negotiation of a new contract covering 6000 employes of the Great Lakes and Michigan Steel plants in Ecorse and the Hanna Furnace plant on nearby Zug Island.

Said to be the first agreement of its kind since the entrance of the United States into war negotiated directly between a major steel company and the USW without an appeal to the War Labor Board, it is made retroactive to Jan. 1, 1942, and provides 5½ cents an hour increase in all pay rates; a provision protecting seniority of any employe entering the armed forces or drafted by the government for work elsewhere; guaranteed minimum wage for each wage group classification; checkoff clause for payment of union dues and liberalization of paid vacation schedules.

Company officials made no comment on the agreement, but the inference was that the provisions were mutually acceptable. Members of the union ratified it Aug. 16. Management signer of the contract was George R. Fink, president.

Committee Named To Consider War Workers' Suggestions

Appointment of a technical committee for individual awards has been announced by the WPB. The committee, composed of distinguished engineers and



S. K. FREDERICK, right, layout man in General Electric Co.'s welded products department, Schenectady, N. Y., works, receives a check for $750 from B. G. Tang, general superintendent, for a suggestion that will save 500,000 pounds of steel. Mr. Frederick noticed waste in cutting sections of ship motors and devised a method of "nesting" the various sections so that more of them could be obtained from each plate. General Electric has paid more than $75,000 for employe suggestions so far this year

technicians, will select the first list of workers in war plants to be honored by the government for contributing valuable suggestions for increasing production.

Members are: Dr. J. L. Bray, head of the School of Chemical and Metallurgical Engineering, Purdue University, Lafayette, Ind.

Whiting Williams, author, lecturer and consultant in industrial relations.

Paul H. Stanley, chief engineer, Pitcairn Auto Gyro Co., Willow Grove, Pa.

Charles B. Francis, chemical engineer and consultant, Carnegie-Illinois Steel Corp., Pittsburgh.

Henry C. Atkins Jr., superintendent, E. C. Atkins Co., Indianapolis.

Dr. Joseph Rockoff, chief chemist, Dayton Rubber Mfg. Co., Dayton, O.

William Plumer Hill, assistant superintendent, Bethlehem Steel Co., Sparrows Point, Md.

The committee met in Washington Aug. 20 and 21 to review approximately 100 of the best of more than 5000 suggestions which workers have submitted to the labor-management committees in their plants.

Labor Shortage Still Serious, Declares McNutt

Current lay-offs in war production plants because of raw materials shortages and allied difficulties have not changed over-all manpower problem. In answer to numerous inquiries, Paul V. McNutt, chairman of the War Manpower Commission, stated last week that the present situation of developing labor stringency remains essentially unaltered.

"Any workers who are now being laid off," he explained, "will be needed at their old jobs or in new war jobs as soon as production problems responsible have been worked out. In no sense can they be considered an addition to the total available labor force. Any large scale shifting of such workers to other areas of demand would only serve to confuse still further the already difficult labor requirement and allocation problems."

"Our expanding production requirements have not changed," Mr. McNutt continued. "Nor has our expanding need for labor. The present situation only increases the necessity for greater production and for the fullest and most careful utilization of the workers we have. It is more important now than ever before to stop labor pirating and hoarding, and to make certain that every individual who is capable of doing a job is given a chance to work whether he is white or black, male or female, native or foreign born, physically perfect or handicapped."

Chrysler Aircraft Engine Plant To Use 6000 Tools

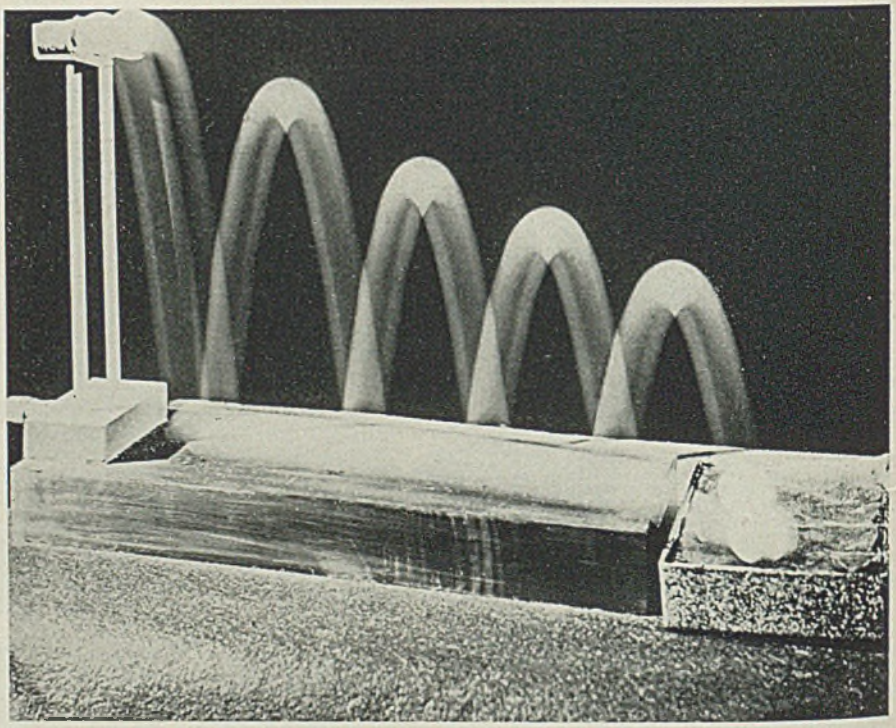
DETROIT

SEVEN thousand men working on two shifts are now employed at the new Dodge-Chicago plant of Chrysler Corp., where airplane engines will be produced in large volume. Practically all the buildings are already in the construction stage, including aircraft engine machining and assembly building, two large foundries, two large forge shops, heat treating and die shop, tool shop, testing buildings, offices and personnel building.

W. J. O'Neil, president of the Dodge division and general manager of the new plant, says that by the end of September more than 12,000 will be working on construction of the plant which will be one of the largest, if not the largest in the world. Monthly production of engines will total in horsepower greater than that of Grand Coulee or Boulder Dam. More than 6000 machine tools will be required, over half of which have been ordered; 483 acres of land have been allocated for the project; facilities are being provided for 10,000,000 gallons of water a day; electric service demands of 30,000 kilowatts will be available; 80 carloads of construction material will be coming in daily when construction activity reaches a peak next month; in excess of 4,300,000 bricks will be required; 15,000,000 board feet of lumber will be used to make cement forms; 500,000 barrels of cement will be needed. The plant involves a new type of concrete construction, including roof trusses.

Six hundred Chrysler Corp. production, engineering and manufacturing officials are planning and laying out this tremendous Chicago project in Detroit. Among those heading this staff are L. L. Colbert, operating manager; W. R. Gerber, general works manager; F. J. Morissette, general master mechanic; C. E. Dalton, chief liaison executive; W. C. Newberg, chief engineer; A. H. Holverkus, planning superintendent; H. J. Laidlaw, plant engineer; C. B. Cornell, personnel director and H. S. Wells, in charge of construction.

Half-Filled Ball Refuses To Bounce



Westinghouse Electric & Mfg. Co. engineers have found that a steel ball half-filled with metallic powder will not bounce, as this time-exposure photograph illustrates. Two balls of the same weight —one empty and one containing powder —were dropped simultaneously from the top of the posts, left. The empty ball left a looping trail of light as it bounced four times on the steel plate. The ball containing the powder rolled without bouncing, as shown by the straight streak of light on the plate. Rough surfaces of the metal powder particles created frictional heat, as they slid over each other, dissipating energy the ball would have used in bouncing, engineers explained. This is finding practical use.

Machine Tool Production 61 Per Cent Ahead of First Six Months in 1941

SPURRED by unprecedented war demand, the machine tool industry is producing more machine tools per month than it formerly built in many full years.

In the first half of this year the industry's output was valued at $558,076,000, a gain of 61.2 per cent over the $346,200,000 reported for the period in 1941. Production during June amounted to $111,147,000, or at annual rate of $1,333,764,000.

Earlier this year it was hoped that the industry's 1942 output would double the record production of $750,000,000 recorded in 1941. It now appears probable that this outstanding feat might be accomplished.

Accompanying table presents monthly output of machine tools so far this year compared with a year ago and also shows the production trend on an annual basis since 1929. July output is expected to be off slightly, reflecting vacation shutdowns at some plants.

There are 325 companies making machine tools in the country today. In addition there are 60 subcontractors, some producing complete units. It is estimated about 14 per cent of total output is attributed to subcontractors. Most problems in subcontracting work have been licked in recent months. Companies doing this work are now familiar with the job and have overcome the numerous snags earlier experienced.

Despite every effort to increase the work week, the machine tool industry as a whole has not yet attained capacity output. Factors limiting production are said to be: Lack of skilled help at the machine and scarcity of foremen to adequately supervise the work, unbalanced production equipment at some plants, and the lag in building up management organization to handle the sharp increase in production.

Many Companies Converted

Reflecting the all-out effort to increase machine tool production, many companies are now active in this field who before the war were in entirely different lines. Among those industries who have converted to machine tool output could be cited companies formerly making paper machinery, printing presses, carpets, and laundry machinery.

Dennison Mfg. Co. (paper products), Framingham, Mass., is now making grinding machines for Norton Co. The Mergenthaler Linotype Co. and Miehle Printing Press & Mfg. Co., in Chicago, are building milling machines and turret lathes. American Laundry Mfg. Co., Cincinnati, is now making radial drills.

It is also interesting to note that marble planers formerly used in the Indiana quarries are being used somewhat to rough plane machine tool castings. Thorough surveys have been made of all idle machinery, with the purpose of placing them in operation at other points or for scrapping.

Machine tool industry spokesmen believe all expansion programs now under way will be completed before the first of the year. Warner & Swasey Co., Cleveland, is completing its third addition; adding 110,000 square feet floor space, costing $2,700,000, and increasing output 40 per cent. Operation of National Acme's new plant at Cleveland has been held up because of inability to obtain wire cable. New equipment in this plant is valued at $3,250,000 and when in full operation will raise Acme's output about 60 per cent. Kearney & Trecker Corp., Milwaukee, largest exclusive manufacturer of milling machines, is completing a $3,000,000 expansion, to increase output 85 per cent. Other expansion programs include that of Rockford Machine Tool Co., Rockford, Ill.; Gisholt Machine Co., Madison, Wis.; W. F. & John Barns Co., Rockford, Ill.; American Tool Works, Cincinnati; Hydraulic Press Mfg. Co., Mount Gilead, O.; and Cross Gear & Machine Co. General Motors Corp. is getting into production of heavy boring machines.

Manufacturers report backlogs of orders still are rising, but that the spread between deliveries and incoming orders is narrowing. Backlogs vary from 3 to 12 months, depending on type of machine.

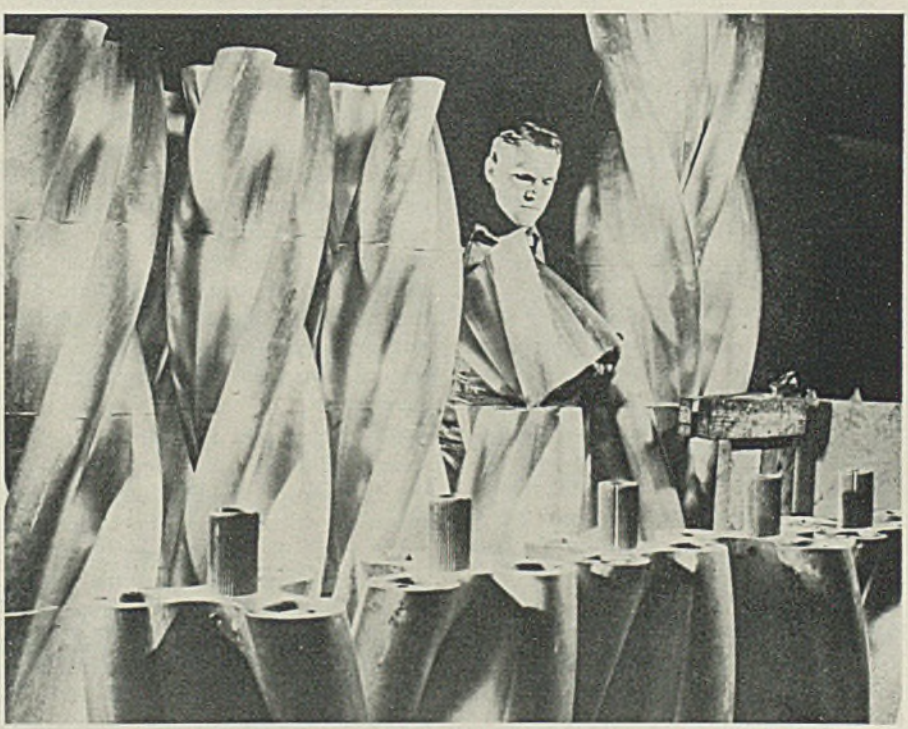
Machine Tool Output

(000 omitted)

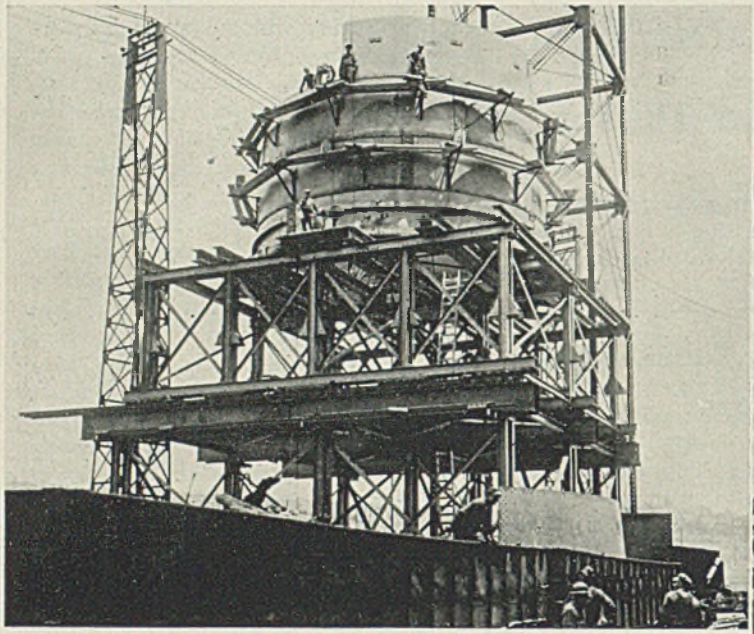
	1942	1941
Jan.	$83,547	$50,700
Feb.	84,363	54,000
March	98,358	57,400
April	103,364	60,300
May	107,297	60,800
June	111,147	63,000
6 months	558,076	346,200
July		57,900
Aug.		64,300
Sept.		68,400
Oct.		77,200
Nov.		74,600
Dec.		81,435
Year		
1929		185,000,000
1932		22,000,000
1937		195,000,000
1938		145,000,000
1939		210,000,000
1940		450,000,000
1941		775,300,000
1942 est.		1,500,000,000

†Figures from November, 1941 released by WPB.

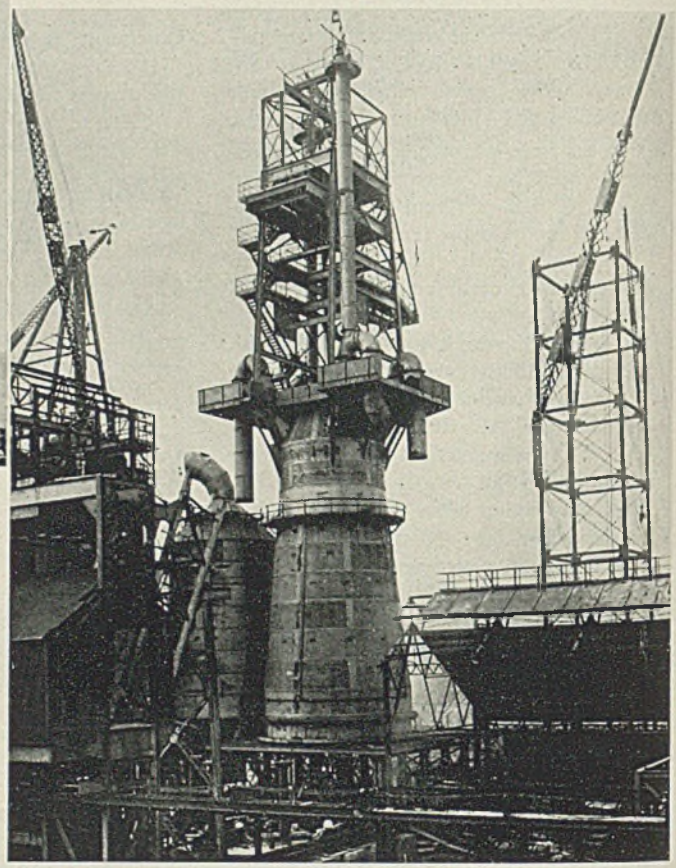
Machine Sculpture



GRACEFUL and pleasing as sculptures in alabaster, these are blower rotors ready to be assembled into diesel engines for the Navy in a midwest manufacturing plant. NEA photo passed by the censor



PROGRESS in building the shell of the new blast furnace is shown from June 25, left, when the initial rings of plates were being riveted on the new stack, to Aug. 19, right, when the completed shell was being moved 100 feet to its permanent site



Old Furnace Dismantled, New Stack Erected Within 90 Days

YOUNGSTOWN, O.

A UNIQUE project of dismantling an old blast furnace, building at the same time a new one alongside of it, and then replacing the old with the new was practically completed last week at Youngstown Sheet & Tube Co.'s Campbell Works. The old stack of 750 net tons pig iron capacity was built in 1913. The new stack's capacity is 1050 tons. The old was blown out July 5, the new is expected to be blown in about Oct. 1.

While old "D" stack was being torn down, the new "D" was being erected within 100 feet of it, on a temporary foundation of structural steel about 12 feet high. Late Wednesday afternoon the new shell, temporary foundation and all, was drawn by cables over a specially constructed railroad to the foundation band that once had been 40 feet diameter, but was enlarged to 46½ feet diameter. The new shell is 100 feet high and weighs 600 tons, with elaborate top hopper, compared with old "D's" height of 88 feet.

At the rate of about 1 foot a minute the new shell was moved most of the 100 feet to its permanent location, when the movement was suspended until Thursday. Then the transfer was completed by lowering it about 3 feet to rest upon seven huge supporting cast columns. The shell moved over two parallel tracks, each built up of three parallel lines of steel railroad rails, the temporary foundation being constructed upon wheel trucks.

Not only was the old furnace itself dismantled, but also downcomers, bustle pipe, gas washer, dust catcher, centrifugal cleaner, hoisting engines and other auxiliaries, including bin system and stockhouse equipment. Today's furnace is new in all respects, including auxiliaries such as gas cleaning equipment, hoisting engines, bins and stockhouse and stove linings.

The thickness of the lining when installed will be 4 feet compared with 2 feet 7½ inches of the old stack. A double skip hoist will be installed instead of a single skip. The hoist engine has 350 horsepower capacity against the former 200. The new stack has 14 tuyeres, or two more than in the old. Cubical contents are 37,583 cubic feet, against 24,195. The new stack has four stoves with 120,000 square feet of heating surface each, compared with four stoves with 47,000 square feet heating surface in the old.

In ordinary blast furnace practice, 175 to 180 days would have been required to build a new and dismantle an old unit, but in this instance only 90 days were required for actual replacement. Thus the maneuver saved 90 days of pig iron production, yielding 90,000 tons of pig iron.

The new shell was erected by the William B. Pollock Co., Youngstown, and the moving was done by Eichleay Engineering Corp., Pittsburgh.

Carnegie-Illinois Furnace Relined in Record Time

Gary, Ind., works of Carnegie-Illinois Steel Corp. last week set a new mark of 21 days, three hours and 50 minutes in relining a blast furnace. Relining was from the mantle up and time required between the last cast of iron preceding the repair period and the first cast of new iron was less than 22 days.

Return of this furnace to production enables the plant to operate 11 of its 12 blast furnaces. The twelfth is inactive for relining and improvements. Except for two weeks when the rate dipped slightly, the plant has operated at 100 per cent or more of capacity since Pearl Harbor.

First Half Plate Output 90% Above Last Year

Steel plate production in the first half totaled 5,174,000 tons, breaking all records and exceeding output in the first six months of 1941 by more than 90 per cent, according to the American Iron and Steel Institute. Plate output exceeded by a wide margin the volume of any single class of steel products, and first half volume is within 17 per cent of the total for all of 1941.

Total steel products output for the six months was 32,684,000 tons, 5 per cent above the figure for first half year.

Production of heavy structural shapes in the first six months this year totaled 2,421,000 tons, 10 per cent above output in the corresponding 1941 period. Merchant bar production at 3,415,000 tons was 7 per cent higher; alloy steel bars at 1,058,000 tons was up 13 per cent. Concrete reinforcing bar output of 1,048,000 tons was 30 per cent higher.

Sheet steel production between the two half years dropped 28 per cent to 4,845,000 tons; strip steel declined 20 per cent to 1,311,000 tons, while production of wire declined slightly to 1,052,000 tons. Total of 1,766,000 tons of tin plate produced through June was 17 per cent above a year ago.

Inland Establishes New Output Records in July

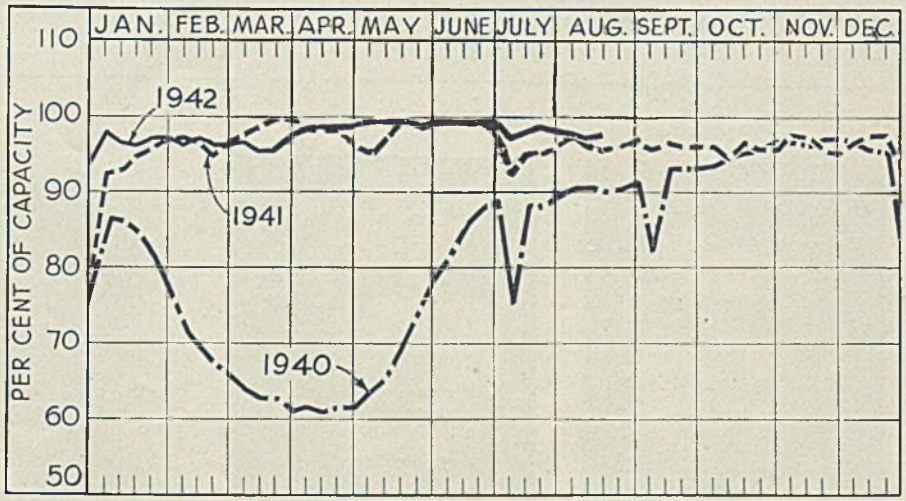
With six months of above-capacity war production on the books since Pearl Harbor, Inland Steel Co., Chicago, accelerated its pace during July and exceeded previous records.

Steel plate shipments from the Indiana Harbor works were three times the heaviest shipments in any month in prewar 1941. Production on the company's 76-inch mill was 178 per cent greater than any prewar month. During a single 24-hour period ended July 31 this mill shipped almost enough plates to build the hulls of two Liberty ships.

No. 2 open hearth workers had the best July in history, beating 1941 production by 1927 tons and 1940 output by 18,479 tons. This was particularly interesting because the company was forced to use "very flimsy scrap."

Other records were established by the 28-inch finishing mill and the 24-inch structural bar and universal plate mill.

Belgian Congo is preparing to increase tin production from 8000 to 20,000 tons annually, the Department of Commerce reports. Since occupation of Belgium, formerly receiving tin concentrates, part of the necessary smelter plant has been built and extensions are being made.



PRODUCTION . . . . UP

PRODUCTION of open-hearth, bessemer and electric furnace ingots last week increased ½-point to 97½ per cent. Four districts were lower; six advanced; two were unchanged. A year ago the rate was 98½ per cent; two years ago it was 90½ per cent, based on capacity as of those dates.

New England—Down 5 points to 90 per cent due to repairs.

St. Louis—Dropped 14.5 points to 83.5 per cent. Two producers removed two open hearths each for relining and other routing repairs, only one furnace being relighted at the week-end.

Chicago — Up 1 point to 102 per cent, highest rate in four weeks.

Buffalo — Steady at 90.5 per cent for third consecutive week, with 39 of the area's 43 open hearths active. Bethlehem Steel Co. is operating 28 out of 30 units, Republic Steel Corp., eight out of nine, and Wickwire Spencer Steel Co., three out of four furnaces.

Detroit — Increased 1 point to 91 per cent of capacity.

Pittsburgh — Up 1 point to 94 per cent.

Wheeling — District mills regained most of prior week's decline, pushing rate ahead 3 points to 83.5 per cent.

Cincinnati—Three open hearths going down for emergency repairs caused a decline of 1 point to 88 per cent.

Youngstown, O.—Advanced 2 points to 96 per cent of capacity.

Central eastern seaboard — Ten furnaces of Lukens Steel Co., resumed operation after being shut down over a week because of flood water in the district, raising the rate 3 points to 95 per cent.

Cleveland — Declined 3.5 points to 94.5 per cent. Lower operations at two plants caused the drop.

Birmingham, Ala. — Held at 95 per cent with operations maintained.

District Steel Rates

Percentage of Ingot Capacity Engaged in Leading Districts

	Week ended Aug. 22	Change	Same week 1941	Same week 1940
Pittsburgh	94	+ 1	100	83
Chicago	102	+ 1	101.5	98
Eastern Pa.	95	+ 3	95.5	89
Youngstown	96	+ 2	98	83
Wheeling	83.5	+ 3	92	99
Cleveland	94.5	− 3.5	93	86.5
Buffalo	90.5	None	93	90.5
Birmingham	95	None	90	88
New England	90	− 5	90	85
Cincinnati	88	− 1	88	78
St. Louis	83.5	−14.5	98	77.5
Detroit	91	+ 1	92	92
Average	97.5	+ .5	°98.5	°90.5

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

Halt Construction of Synthetic Rubber Plant

WASHINGTON

Construction activity on the $90,000,000 synthetic rubber plant at Gary, Ind., was halted last week by Secretary of Commerce Jesse H. Jones, because "sufficient supplies of butadiene," synthetic rubber raw material, had been found elsewhere in the country. He said the project had not been canceled but deferred.

W. B. Plummer, president, Rubber Synthetics Inc., designated to operate the plant on its completion, announced that the deferment did not imply a reduction of the 877,000-ton goal of the national synthetic rubber program, but that action had been taken to save a large amount of critical materials for war purposes.

Engineering officials estimated the sum already spent on the development would exceed $3,500,000.

MEN of INDUSTRY

Edward F. Early

Karl Landgrebe

William Heidgerd

William A. Harding

EDWARD F. EARLY, superintendent, Morgan works, Wickwire Spencer Steel Co., has been named general superintendent of the Worcester, Mass., district, with supervision over the Morgan and Goddard works in Worcester and the Clinton, Mass., works. Mr. Early's entire business career has been with Wickwire Spencer, having joined the Morgan works in June, 1910, as an errand boy. He was successively spring maker, transportation foreman, assistant foreman of the spring department, production clerk, wire mill foreman and assistant superintendent. He became superintendent in 1929.

♦

Karl Landgrebe, vice president in charge of administrative and special duties, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., and employed by the company more than 32 years, retired Aug. 17. He is an outstanding civic leader in Birmingham. A native of Cleveland, Mr. Landgrebe graduated from Case School of Applied Science in 1898. After working at blast furnaces in Chicago, Toledo, O., and Bethlehem, Pa., he joined the Tennessee company in 1910 as superintendent of the Ensley blast furnace department. Successively he was assistant general superintendent at Ensley, general superintendent, vice president in charge of operations, and his latest post, which he held since 1935.

♦

A. J. Brandt, president, National Tool Co., Cleveland, has been named a director, Consolidated Aircraft Corp., San Diego, Calif.

♦

A. S. Bonner has been elected president, Clark Equipment Co., Buchanan, Mich., to succeed the late Eugene B. Clark. **George Spatta** has been named executive vice president and general manager, and **Ezra W. Clark** has become vice president in charge of the truck-tractor division.

♦

William Heidgerd, the past 15 years associated with Jones & Laughlin Steel Corp. in various sales capacities in Chicago, Pittsburgh and Detroit, has resigned from the Detroit district sales force of that company to become associated with the Traverse City, Mich., organization of the Parsons Co., Detroit, in a purchasing capacity.

♦

Leopold E. Block, chairman of the finance committee, Inland Steel Co., Chicago, has been elected a director, First National Bank of Chicago, to succeed the late Philip D. Block.

♦

F. Ward Coburn has been elected president of the E. & G. Brooke Iron Co., Birdsboro, Pa., and the Richard Ore Co., Wharton, N. J. Mr. Coburn, formerly vice president of the two organizations, succeeds the late Robert E. Brooke.

♦

R. F. Ohmer recently resigned as president of New Wrinkle Inc., Dayton, O., upon reporting for duty Aug. 1 as a colonel in the United States Army Air Forces. Colonel Ohmer is temporarily stationed at Patterson Field, O. A veteran of World War I, Colonel Ohmer was overseas with the 37th Division, entering the service in 1917 from the Ohio National Guard. During his absence, New Wrinkle Inc. is under direction of **J. C. McCorkhill,** general manager.

♦

Stanley C. Schuler has joined the New York public relations section, General Electric Co., New York, as general assistant to **K. G. Patrick,** who is in charge of the office. Mr. Schuler replaces **Lieut. William H. Dinsmore,** now in active service with the Navy.

♦

William A. Harding has been appointed manager of sheet, plate and specialties, Jessop Steel Co., Washington, Pa. He studied metallurgy at Polytechnic Institute, Brooklyn, N. Y., and had been associated the past 20 years with Crucible Steel Co.

♦

James H. Davis, manager, Moraine Products Division of General Motors Corp., Dayton, O., since 1924, has been named special assistant to **E. F. Johnson,** vice president of General Motors in charge of the Dayton divisions and Eastern Aircraft Division. Consolidation of the Moraine Products and Delco Brake Divisions in Dayton has been effected, the new organization to be known as Moraine Products Division. It will be headed by **Bernard A. Brown** as general manager, heretofore general manager of Delco Brake.

Earl S. Patch, active in the development of powdered metal products of Moraine, will continue with similar responsibilities in the new division.

♦

George Frutchey has been named manager of the Chicago office, Lord Mfg. Co., Erie, Pa., manufacturer of vibration insulating equipment, succeeding **George P. Harrington,** who has joined the Navy as a lieutenant.

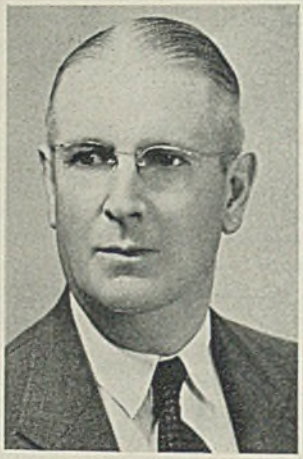
♦

Brig. Gen. Thomas S. Hammond, former president, Whiting Corp., Harvey, Ill., has been appointed chief, Chicago Ordnance District, effective Sept. 1, to succeed **Brig. Gen. Donald Armstrong,** who has been made chief of the Army's

new combat automotive center, Detroit. General Hammond has been associated with the ordnance office since Jan. 21, when he resigned as president and general manager of Whiting Corp. to become the district's production advisor. He became chief of the production service in May and two months later was appointed deputy district chief.

♦

John H. Collier has been appointed sales manager, and **Howard E. Jenkins,** assistant sales manager, Nicholson File Co., Providence, R. I. Mr. Collier joined Nicholson File soon after graduating from Brown University in 1906. From 1907 to 1912 he represented the company throughout the South and Southwest territory. He became assistant sales manager in 1912. Mr. Jenkins entered the employ of Nicholson in 1938, representing the company in the Eastern territory with headquarters in Philadelphia. In 1941 he was transferred to the sales department at Providence.



John H. Collier

H. E. Jenkins

♦

M. B. Elliot has been named manager of sales, Unit Equipment Section, General Electric Co., Schenectady, N. Y. Since 1926 he has served as transformer specialist for the east central district, with headquarters in Cleveland.

♦

Oliver J. Williford Jr., since 1936 assistant general freight agent, Illinois Central railroad, Chicago, has been appointed to the newly created post of assistant manager of foreign freight traffic, with headquarters in Chicago.

♦

Morgan C. Monroe has been promoted to assistant director of industrial relations, and **Frank C. Hargreave** to personnel manager, Republic Aviation Corp., Farmingdale, N. Y. Before joining Republic Aviation last May as employment manager, Mr. Monroe did personnel work for the Connecticut Mutual Life Insurance Co. Mr. Hargreave has been associated with Republic since last September, recently as supervisor of selective service.

♦

W. L. Lentz, manager, American Locomotive Co., announces appointment of five additional assistant superintendents for the company's plant at Schenectady, N. Y. New appointees are **J. W. Biggerstaff, E. W. Bradford, J. P. Fleming, J. A. Graulty** and **J. D. Reynolds.** Mr. Lentz said the action was taken because of the rapid expansion of the plant under the war production program, and the new assistant superintendents will further strengthen the supervisory force of the plant, largest of the company's seven factories.

♦

A. B. Betz, owner and founder of S. A. E. Steels, Cleveland, was honored at a dinner Aug. 18 by company employes and associates on his fiftieth year in the steel warehouse business.

♦

Victor E. Williams, assistant general manager of sales, Organic Chemicals Division, Monsanto Chemical Co., New York, has been promoted to director of sales of that division. **Frederick C. Renner,** assistant general manager of sales, Organic Chemicals Division, has been made general manager of sales, with offices in St. Louis.

♦

Ralph Griffith, associated with the Chicago office of Drive-All Mfg. Co., Detroit, has been advanced to sales manager. He succeeds **C. A. Cowdrey,** who has been promoted to general manager, with headquarters at Detroit.

♦

F. C. Todd, formerly a member of the faculty of Pennsylvania State College, has joined the technical staff of Battelle Memorial Institute, Columbus, O., and has been assigned to research in industrial physics.

DIED:

Frederick Lee Stone, 66, vice president and a director, Universal Atlas Cement Co., United States Steel Corp. subsidiary, at St. Mary's hospital, Rochester, Minn., Aug. 17. Joining the company in 1911 as a salesman, he advanced successively to chief clerk, assistant sales agent, division sales manager, assistant general sales manager, general sales manager, and in 1932 became vice president. The past several years he had resided at the Biltmore hotel, New York.

♦

Frank W. Lindgren, 86, founder, Mechanics Universal Joint Co., Rockford, Ill., now a division of Borg-Warner Corp., in that city, Aug. 17. He also organized Forgings & Stampings Inc., Rockford.

♦

John F. Wyzalek, 47, chief metallurgist, Hyatt Bearings Division, General Motors Corp., Harrison, N. J., and a nationally known authority on heat treatment of metals and carburizing methods, Aug. 8. He joined Hyatt in 1913 as a laboratory technician. Mr. Wyzalek was a member, American Iron and Steel Institute, American Society for Testing Materials and American Society for Metals. He contributed many articles on gas carburizing, heat treating and other metallurgical subjects to technical and trade papers. At his death he was serving as state chairman, War Products Advisory Committee for the ASM.

♦

Clifton W. Edwards, 57, superintendent, Brier Hill plant, Youngstown Sheet & Tube Co., Youngstown, O., Aug. 16, at his home in that city. Beginning his steel career with Bethlehem Steel Co., he joined Youngstown Sheet & Tube at Indiana Harbor, Ind., as a roller 25 years ago, and has been with that company ever since, except for the period from 1930-31 when he was general superintendent, A. M. Byers Co., Ambridge, Pa.

♦

Leonard Wesson, 65, since 1937 operating manager, Universal Atlas Cement Co., United States Steel Corp. subsidiary, New York, Aug. 15, at White Plains hospital, White Plains, N. Y. He joined the cement division of the former Illinois Steel Co. in 1904 as superintendent. From 1919 to 1930 he was assistant general superintendent, Atlas Portland Cement Co. and when Universal Portland Cement Co. and Atlas were merged in 1930, he became assistant operating manager.

♦

Orra L. Hollister, 79, president, Federal Malleable Co., West Allis, Wis., in Milwaukee, Aug. 14.

♦

E. Otto Kollsman, 41, founder and former treasurer and comptroller, Kollsman

Instrument Co., Elmhurst, N. Y., Aug. 12, in Montpelier, Vt. Mr. Kollsman retired from the firm in 1940 when, through merger, it became Kollsman Instrument Division of Square D Co.

♦

William F. Kinsella, 59, vice president and treasurer, Worden-Allen Co., Milwaukee, Aug. 15, in that city. Associated with the company since 1903, he became vice president in 1909 and in 1936 assumed the additional duties of treasurer.

♦

John P. Sykes, who during his 59 years of service with Baldwin Locomotive Works, Philadelphia, advanced from apprentice to senior vice president, at his home in Wallingford, Pa., Aug. 16. Born Sept. 25, 1859, at Charlotte, N. C., Mr. Sykes was apprenticed to the Baldwin Locomotive Works at the age of 20. His advancement was steady and he served in various supervisory capacities. He resigned as vice president and a director on March 3, 1938, and retired from active participation in the affairs of the company.

♦

Mark Winslow Potter, 76, the past six years president, Pennsylvania Coal & Coke Corp., and a former member of the Interstate Commerce Commission, in New York, recently.

♦

John H. Schmeller, 85, industrialist, construction engineer and metallurgist, Aug. 12, in Cleveland. Mr. Schmeller retired in 1940 as president and chairman of the National Bronze & Aluminum Foundry Co., Cleveland, which organization he founded 30 years ago. He held several patents on methods of processing aluminum and other metals.

♦

Hugh M. Rice, 52, vice president, Phelps Dodge Refining Corp. of Illinois, Chicago, Aug. 6, in New York, where he also maintained offices.

♦

Frank B. Crawford, foundry foreman, Union Spring & Mfg. Co., New Kensington, Pa., Aug. 5. He had served as foreman 22 years.

♦

Arthur E. Painter, the past ten years New York representative, Atlantic Steel Castings Co., Chester, Pa., Aug. 14, at the age of 50. Associated with the steel foundry industry most of his life, Mr. Painter was formerly with the Reading Steel Castings Co., Reading, Pa., Bayonne Steel Castings Co., Bayonne, N. J., and Riverside Steel Castings Co., Harrison, N. J.

American Petroleum Institute will hold its Twenty-third annual meeting as originally scheduled, Chicago, Nov. 9-13, but at the Palmer House instead of the Stevens hotel. Plans for the meeting have not been completed.

First Half Steel Earnings Lowest In Three Years

IN THE first half of 1942, when steel production was breaking all prior records, net earnings of steel companies dropped sharply to a total below earnings in any six-month period since the first half of 1939, according to a report by the American Iron and Steel Institute.

After paying taxes and meeting all other expenses of operation, net income of a group of 72 companies representing over 90 per cent of the industry's total capacity, amounted to $116,407,000.

By comparison, in the last half of 1941, reports from a similar group of companies showed aggregate earnings of $167,421,000, while in the first half of last year steel company earnings totaled $188,945,000.

Earnings in the first six months of this year were at a rate representing a return of less than 5.3 per cent on investment in the industry—fully one-third less than the return earned in 1941 and still farther below return earned in the peacetime year 1929.

Payrolls Up 30 Per Cent

Among the principal factors in reducing net earnings this year have been increases in wages, taxes and certain other costs of operation. Steel prices, however, have remained practically unchanged over the past three years.

Payrolls of the companies in the first half of this year, including payrolls of certain subsidiaries which do not make steel, amounted to $969,855,000, or 30 per cent above payrolls in the corresponding period of last year.

The total amount of taxes paid or reserved for payment in the first six months of this year exceeded $392,913,000, or 80 per cent above taxes in the corresponding months of 1941 and almost double the tax payments by the industry in any full year prior to 1941.

Steel company taxes in the first half of this year amounted to over 40 cents per dollar of total payrolls, compared with 29 cents in taxes paid per dollar going into payrolls in the first half of last year.

A total of $72,846,000 in dividends was distributed to the half million stockholders of the companies during the first six months of this year. In the corresponding period of 1941, dividend payments amounted to $73,286,000.

First half aggregate net income of 290 leading industrial groups compiled by National City Bank, New York, totaled $474,583,000, against $725,251,000 in 1941. This represents a decrease from 11.9 to 7.5 per cent in return on investment.

The manufacturing group, comprising 242 companies, had net income during the first six months of $436,099,000, against $688,526,000 in 1941. Their rate of return dropped from 12.4 per cent in 1941 to 7.5 per cent in first six months this year.

United States now has a total of 31 "billionaire" business enterprises whose aggregate assets of more than $66,000,000,000 are the greatest in history.

The Bell System, comprising the American Telephone & Telegraph Co. and subsidiary and affiliated companies, maintains its No. 1 spot. Metropolitan Life Insurance, with assets of $5,648,047,196, was in second place. United States Steel Corp. stood in twelfth place with assets of $2,045,021,000. General Motors Corp. was fifteenth.

Light Alloys Division Organized by A.F.A.

Recognizing the increasing demand for aluminum and magnesium castings and the rapid growth of those divisions of the foundry industry, the American Foundrymen's Association has divided its present nonferrous division to create a new light alloy division. The present nonferrous division, whose membership includes those interested in the production of brass, bronze and light alloy castings, will become the brass and bronze division.

The first step in the organization of the light alloys division will be the appointment of an advisory committee to direct its activities. Among those who have already volunteered for service are Dr. N. E. Woldman, chief metallurgical engineer, Eclipse Aviation division, Bendix Aviation Corp., Bendix, N. J.; W. E. Martin, metallurgist, Sperry Gyroscope Co. Inc., Flushing, N. Y.; Leslie Brown, plant manager, magnesium fabricators division, Bohn Aluminum & Brass Corp., Adrian, Mich.; H. J. Rowe, metallurgical engineer, Aluminum Co. of America, Cleveland; A. T. Ruppe, foundry superintendent, Bendix Products Corp., South Bend, Ind.; Carleton C. Hitchcock, superintendent, R. C. Hitchcock & Sons, Minneapolis.; and B. D. Claffey, vice president and manager, General Malleable Corp., Werra Aluminum division, Waukesha, Wis. Other outstanding members of the light alloys castings industry are being approached to serve on the advisory committee.

Anyone interested in taking part in the activities of the new light alloys division is requested to volunteer his services to R. E. Kennedy, secretary, American Foundrymen's Association, 222 West Adams street, Chicago.

"Housecleaning" in WPB Started by Nelson; Consultant Is Dismissed

WASHINGTON

WAR Production Chief Donald M. Nelson last week served notice on his critics that his patience has been exhausted by an undercover campaign of sniping at his administration of the war production campaign.

"From now on anyone who crosses my path is going to have his head taken off," the WPB chairman, noted for his patience, declared.

First evidence of the new fighting spirit of Mr. Nelson was revealed in the dismissal of Frederick I. Libbey, a WPB engineering consultant, who disclosed a confidential report to the effect the Iron and Steel Branch was inefficient and required reorganizing. The report is understood to have been undertaken as result of the Truman committee investigation and charges that a "black market" in steel operations existed. The WPB Compliance Branch investigated the latter charges and reported they were without foundation.

For several weeks stories have been emanating from Washington, that Mr. Nelson soon would practically abdicate to the armed services in the control of the war production program.

These reports of the diminution of Mr. Nelson's job—never forthright predictions that he would resign—apparently aroused the deliberate and patient WPB chieftain.

"I'm going to get tough enough to get this job done, and the job will be done, you can be sure of that. There'll be no more alibis. I'm sick of them."

Among the charges tossed at Mr. Nelson were that many war plants would be forced to close due to shortage of materials, implying that control of those materials has been mismanaged.

Mr. Nelson stated: "There has been too much loose talk about this program. They say 1000 plants may be shut down for lack of materials. That is wrong.

"In every program there must be adjustments, and we are making those adjustments now. I can see the way ahead and we are going to come out on top."

Mr. Nelson made it plain that he no longer will tolerate "fifth wheels" and misfits in the WPB. One of the most frequent criticisms directed at him has been his reluctance to unburden the organization of nonproducers and nonefficient employes foisted upon him by the administration.

The WPB chief's statements indicate he also is prepared to delineate clearly the demarcation between his agency and the armed services. Mr. Nelson never has admitted that any conflict exists, but subordinate officials in the board say that such conflict is apparent.

PRIORITIES – ALLOCATIONS – RICES

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

M ORDERS

M-15-b-1 (Amendment): **Rubber,** effective Aug. 15. Establishes specifications for manufacture of rubber-covered rolls used in the paper, textile, tanning, steel and other industries.

M-53 (Amendment): **Printing Ink,** effective Aug. 13. Removes restrictions on use of orange mineral (lead oxide) in printing ink. Permits use of varnishes containing glycerol phthalate resins and phenolic resins in making certain inks and gloss overprint varnish if such varnishes were manufactured prior to March 30, 1942.

M-154 (Amendment): **Thermoplastics,** effective Aug. 14. Extends date for scheduling of operations by manufacturers to begin to Oct. 1, pending revisions in thermoplastics control. M-154-a, effective, Aug. 14, restricts use of polyvinyl butyral to war orders. M-154-b, effective Aug. 14, prohibits disposition of methyl methacrylate sheet scrap except to reprocess into sheeting.

M-29 (Amendment): **Tungsten,** effective Aug. 18. Permits delivery of ores or concentrates by any producer, dealer, or processor to dealers or processors for concentration or beneficiation purposes without specific authorization by WPB.

P ORDERS

P-98 (Extension): **Petroleum Industry Materials,** issued Aug. 13. Extends order until Sept. 15.

L ORDERS

L-30 (Amendment): **Kitchen, Household and Miscellaneous Articles,** effective Aug. 15. Reduces iron and steel use in making cooking utensils in August and September to 70% of rate during year ended June 30, 1941. Use in making kitchen ware and essential household articles fixed at a 50% rate.

L-42 (Amendment): **Plumbing and Heating Simplification,** effective Aug. 15. Permits manufacture of pipe fittings necessary for operation of fire protection sprinkler systems and for drain pipes.

L-112a: **Industrial Power Trucks,** effective Aug. 14. Lists approved standard models of trucks which manufacturers are permitted to build.

L-154: **Steam Surface Condensers,** effective Aug. 19. Schedule II prohibits use of copper, copper base alloy, nickel or tin in tube sheets. Requires tubing for condensers to be made of Admiralty or Muntz metal.

E ORDERS

E-1-b (Amendment): **Machine Tools,** effective Aug. 13. Provides for reallocation of tools after certain quotas have been filled.

PRICE SCHEDULES

No. 2 (Amended)—**Aluminum Scrap and Secondary Ingot,** effective Aug. 20. Establishes maximum prices for segregated solid scrap other than 2S, for aluminum drosses, skimmings, grindings, sweepings, sawings and spatters. Reduces maximum prices for all grades of obsolete scrap except pure cable by 1 cent. Establishes methods for determining maximum prices for all grades of secondary ingot not previously covered. Places ingot prices, formerly f.o.b. point of shipment, on modified "carload freight allowed" basis.

No. 10 (Amendment)—**Pig Iron,** effective Aug. 21. Adjusts prices on shipments from Buffalo when made all-rail to points formerly supplied by barge.

No. 136 (Amendment)—**Machine and Parts,** effective Aug. 19. Sets March 31, 1942, as base date for pricing special gages.

No. 204—**Idle or Frozen Materials,** effective Aug. 20. Establishes formulas for pricing such materials sold under Priorities Regulation No. 13.

Contractors Asked To Use Standardized Equipment

WPB has appealed to all contractors in the fields of power plant construction and oil refinery and synthetic rubber plant construction to use, insofar as possible, only equipment of standard design.

Howard Coonley, chief of the Simplifications Branch of the Conservation Division, in letters to designers and constructors of power plants, oil refineries and synthetic rubber plants, pointed out that almost all materials used in this construction are on the critical list.

R. L. Vaniman Succeeds Kanzler As Chief of WPB Auto Branch

R. L. Vaniman, Detroit, has been appointed chief of the WPB Automotive Branch by A. I. Henderson, deputy director general for industry operations. Mr. Vaniman succeeds Ernest Kanzler, who recently was appointed deputy chairman for program progress of the WPB. Mr. Vaniman has been assistant chief of the Automotive Branch.

Million Kilowatts of Power To Be Added

More than a million kilowatts of hydro power will be added by July, 1944, at five Bureau of Reclamation multipurpose irrigation projects in the West.

Additions will bring the total operating capacity of reclamation power plants in 12 states to 2,500,000 kilowatts. The potential annual output will be more than 20,000,000,000.

WINDOWS of WASHINGTON

Sufficient ships available to haul war materials, but nonessential seaborne traffic appears doomed . . . Future of trade union movement believed imperiled as rash actions of locals increase public resentment

WASHINGTON

COMMUTERS and other travelers of late have observed vast accumulations of military supplies at various seaports on both coasts. These and other observations have resulted in fears that all might not be well in moving our armament across the seas to the various theaters of war. Rumors and questions have drifted in to Washington; these reflect a rather widespread impression that military goods are not moving as they should. Many people fear there is insufficient cargo space. Many cite government leases of warehouse facilities and wonder whether this indicates a bad shipping situation.

It can be stated on the best authority that there is no foundation for such fears. Our goods are moving abroad in the scheduled volume. Persons who observe large stores of military goods, it is explained, should understand that it is necessary to assemble huge quantities of all sorts of supplies at the various depots so that shipments abroad may be balanced. Ships must be loaded and gotten under way without delay. They cannot be held up by a lack of this or that item. Hence the reason for maintaining complete stocks of all supplies involved at the various depots.

Task Not Easy

There is no reason, according to reliable information, to fear any change in this situation. There will continue to be plenty of ships to move war supplies in a volume that will meet the existing schedules.

The job of providing cargo space for these shipments of military supplies is not an easy one. It is being accomplished by the virtual elimination of commercial shipping. In fact, what few instances of nonessential commercial shipping still remain are slated to disappear. The effect will be another contribution to the "lean but healthy" economy our people have been told to expect. Many items used in our daily lives which depend on seaborne transportation are due to become scarce and disappear. But the supply of bottoms for exporting military supplies is to be sufficient at all times. By various means, such as complete co-ordination of American and British merchant fleet movements, we are assured of our ability to carry on a large military effort.

Self-Perpetuation, First Law of Labor Leadership

Labor leaders at the national capitol are secretly worried about the future of the labor movement in the United States. Nobody knows better than they that the country as a whole is dissatisfied with the performance of organized labor in this war up to the present time. They fully realize the possibility of eventual consequences from mounting public indignation over a consistent record of demands for increases in pay and closed shop and maintenance of membership contracts.

The question naturally arises: Why do they not follow a course that would merit public approval?

The answer to this question is that human nature is what it is—and no more. Labor leaders cannot be statesmen. By the very nature of their position they must be politicians and pressure men. To remain leaders they must demand what is wanted by their followings. Union memberships contain many rugged individuals who have firm convictions as to their rights. They usually are patriotic Americans; sometimes, like many other Americans, they put self-interest first. Labor leaders are confronted with complex problems. Their chief concern is to keep on being leaders—and that accounts for many aspects of the overall labor picture that may seem strange to the casual observer.

That the top leaders are sincere in demanding full production for the war without any work stoppages, cannot be doubted. However, they do not have control of local unions or the leaders of these local unions. It is the rash conduct of locals that is the chief worry of the top leaders. To any who wonder why the top leaders do not establish a certain degree of discipline over the locals, the answer is that they just do not rebuke locals and leaders of locals. In that respect they are in the same position as members of congress who have to keep the goodwill of their constituency in order to remain in office.

In connection with labor, it is an interesting fact that manufacturers who come here to serve in various capacities in the government and who come into contact with labor leaders soon develop a more sympathetic attitude toward labor in general than they felt while they were working at their normal jobs.

A few days ago a dollar-a-year man in an important post in the War Production Board was told about a number of instances involving labor offenses. One of them, for example, had to do with a case where men in a certain plant worked July 4 at time-and-a-half pay only to take off a day at regular pay during the following week.

"Labor is not any worse offender than any other element in our social structure," he commented. "For every case of bad labor conduct we find a bad case of management. The old mid-week golf game continues to hold up pretty well. Someone here was telling of his amazement at the large number of cars from various states to be seen at the recent Kentucky Derby.

"I believe the average American, whether he is laborer or something else, is a good citizen at heart and is willing to pitch in and give his last ounce of effort when he understands the real extent of the emergency. A lot of people are not yet awake—but they are due to wake up very soon when the first large casualty lists start to come in. It probably will take that to make them realize we are in a war."

Important Possibilities In Use of Boron in Alloys

Hardly a week goes by without some new development, either announced or unannounced, having to do with wartime steel metallurgy. The latest idea to receive consideration is the use of boron as an alloying element. As this is something new, the exact effects of boron are not yet known. However, certain steel companies have been studying boron additions.

As a result of preliminary data that have been accumulated, it is possible that some of the NE steels of the chromium-nickel-molybdenum type will be pepped up with boron.

It has been found that too much boron causes entire loss of ductility, resulting in a steel that is brittle. But experience to date indicates that 0.003 per cent boron in a steel containing 0.50 chromium, 0.50 nickel and 0.25 molybdenum gives greater hardenability without hurting the ductility of the steel too much. Results up to the present time suggest the possibility of re-

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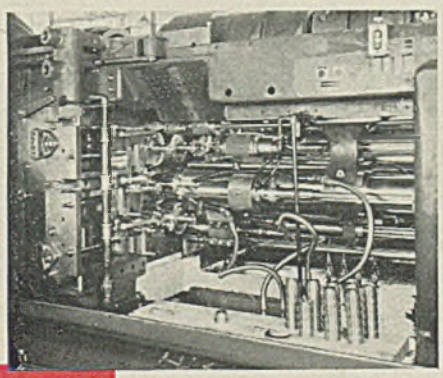

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ducing either or both the carbon and manganese contents by such an addition of boron.

The objective at which the boron investigation is launched is a new type of steel that will have abrasion resistance combined with impact resistance. If present data prove conclusive the new boron alloy steels are intended for use in gears, certain forgings, and in reciprocating parts which must endure severe wear and without failure by breakage.

Army To Use More Substitutes for Critical Construction Materials

WASHINGTON

FURTHER restrictions on the use of critical materials have been instituted by the War Department in its $7,500,000,000 construction program.

A revised "List of Prohibited Articles for Construction Work" for barracks and buildings is considerably more drastic than the original list issued April 1 by the Army and Navy munitions Board.

In the new list, restrictions continue severe on copper, rubber, steel, zinc, lead, and aluminum. Chromium, magnesium, and nickel, are virtually barred. Additional prohibitions limit further the use of drying oils, fuel oil, wool, mahogany and aircraft grades of spruce.

The Army has frequently innovated substitutes in its construction work, in many instances long before private building felt the pinch. Months ago, plans were changed and specifications altered on cantonments, airfields, ordnance plants, and installations for the Services of Supply. Minor changes in specifications often save tons of critical materials.

Use of copper and brass, along with structural steel and steel plate, has been drastically curtailed or eliminated entirely where possible by the Corps of Engineers, which is in charge of Army construction. Normally 140,000,000 pounds of copper would be required on a construction program of the size and scope the Army is doing, but one-fourth that amount will suffice on the basis of present indications.

Copper flashing for roofs and walls is replaced by flashing of asphalt-coated steel. Brass in bathroom fixtures has virtually disappeared. Various flush valves were re-designed to halve the brass content. On faucets alone some 35,000 pounds of brass will have been saved by the end of 1942.

A considerable amount of rubber insulation has been eliminated by the use of weather-proofed wiring, and open knob and tube insulation. Wire covering of fibrous paper being substituted for rubber sheathing.

Large tonnages of steel have been diverted to other war purposes. For some time, concrete, wood, and sheet steel have been going into structures of the Services of Supply wherever they could supplant steel plate. For the last quarter of 1942, this conservation policy has slashed steel plate requirements for construction uses to 48,000 tons, whereas 202,000 tons would be needed on the basis of specifications as written on Nov. 1, 1941.

There now are wooden spans in airfield hangars and storage plants; concrete in columns; wood and reinforced concrete in storage tanks. Grease traps of vitrified china supplant cast iron in their Army mess hall function of collecting garbage and recovering fats for the manufacture of glycerine. Three big purchases since May 1942 have saved 2250 tons of cast iron on this one item. Vitrified china in sinks, lavatories, and bathroom and kitchen fixtures has replaced many tons of metal.

Shower cabinets are made of pressed wood wallboard, as are spray cabinets for sterilizing dishes.

Hot water boilers and heaters are being re-designed with a safety factor that is lower, yet adequate. This will cut by one-fourth the total steel requirements needed for such boilers, with an indicated shift from 2000 tons of plate to 1500 tons of sheet metal on projects now in sight. Space heating systems are being changed from high steam pressure to low, so that cast iron can be used in lieu of steel plate.

Most kitchen equipment is largely of sheet steel or iron coated with porcelain enamel. Substitutions were made long ago on small sizes of utensils. Cooks' tables and pan racks are made of wood. Elaborate dish washing apparatus is simplified to conserve metal. Stainless steel and monel metal are eliminated, except where indispensable.

Copper screening has been eliminated in favor of zinc-coated steel. A plastic screen fabric for use in the tropics is being considered.

Construction of Electric Power, Light Lines Halted

WPB has halted further construction of electric power and light projects which had been permitted under prior authorization with respect to projects 40 per cent complete on Dec. 5. The ban is designed to conserve critical materials.

The WPB action, taken through issuance of Amendment No. 3 to Preference Rating Order P-46, does not affect the construction of important war projects which have been or may be specifically authorized by WPB.

Amendment removes from P-46 the authority to all utilities to complete construction projects 40 per cent complete on Dec. 5, and provides that there may be no additions or expansions to electric systems except as specifically authorized by the Director General for Operations of the WPB.

Army Buys 880,000 Trucks; Many To Have Wood Bodies

In one day recently the Army purchased 880,000 trucks and trailers of various types in 64 separate contracts with 41 manufacturers, the War Department announced last week. Total cost of the vehicles will exceed $1,500,000,000.

Majority of the new trucks will have wood bodies, conserving critical metal. Steel-bodied cargo trucks are still required for some purposes, especially for tropical usage because it resists insect and weather damage.

Conversion to wood bodies indicates a saving of some 75,000 tons of steel in 1942, and probably 350,000 tons in 1943. It applies to cargo body trucks of 1½-ton capacity and heavier.

Aside from the steel conserved, the substitution of wood bodies for steel means that many small manufacturers will participate in the orders. Likewise the hardware will be made primarily by small concerns, upon the insistence of the Purchases Division of Services of Supply. Substitution of wood for steel bodies began in April.

Reduce Steel Allowance for Kitchen Utensil Production

Use of iron and steel in the manufacture of kitchen utensiles and household articles has been further reduced in Amendment No. 6 to Limitation Order L-30.

During the period from Aug. 1 to Sept. 30 iron and steel needed in the manufacture of cooking utensils may be used at 70 per cent of the rate of use during the 12 months ended June 30, 1941. This is a reduction from the previously permitted use of the iron and steel at a 90 per cent rate.

During the same two-month period iron and steel may be used in a second group of articles, consisting mainly of kitchen ware and essential household articles, at a 50 per cent rate.

War Contract Price Readjustments To Be Primarily Reappraisal of Costs

WASHINGTON

POLICIES and procedures to be followed in the overall renegotiation of war contracts for the purpose of lowering costs were outlined last week by the Price Adjustment Boards of the Army, Navy and Maritime Commission.

Each of the three agencies has established separate boards, which will work together in assigning war contracting companies to the department, commission or Army supply service for which the company does most of its war work.

Each company will renegotiate before only one price adjustment unit, and settlements thus reached will be made on behalf of all departments and supply services.

No fixed method for determining a reasonable profit is contemplated by the renegotiation units. A statement by the three agencies sets forth the policies to be followed:

"The renegotiation program is essentially one of reducing contract prices which may involve eliminating or recapturing excessive profits.

"The overall profit is taken as the primary basis of renegotiation, and not the individual contracts.

"The right of industry to a reasonable profit is recognized as fundamental."

The price adjustment boards emphasize that no rigid formula will be followed, but rather that a flexible procedure will be employed.

"An operating profit of a given per cent may be too high in one situation, and too low in another. Stated simply, such profit is to be related to volume of production. Congress obviously intended, in requiring this program, that these flexible procedures should obviate the need for imposing a flat percentage profit based on volume. Profits are to be computed before federal taxes, since it is not the function of the price adjustment boards to vary profit margins so as to shift or circumvent the tax burden imposed by Congress, through war tax laws.

No Fixed Formula

"There is no fixed nor inflexible formula, or mode of procedure. The situation of no two companies is exactly alike. Due consideration is given, among other things, to relative efficiency, risks, financial record, extent of conversion to war purposes, and performance in the war effort.

"Detailed audits or complete scrutiny of a war contractor's books and records are not contemplated for the program is undertaken in the spirit of cooperation. However, certain basic information may be required."

That certain types of risks deserve special consideration is recognized by the price adjustment units. Among these are increases in labor and materials costs; inexperience with new types of production; complexity of manufacturing technique; and delays attributable to unavailability of materials.

"Special situations arise where a company converts all-out to war purposes, and become financially extended," the agencies states. "This is an important factor to be taken into consideration.

"The work of these price adjustment boards, in treating with the overall problem, will not obviate the duty of contracting officers (unrelated to the boards) to continue to survey the specific contracts in their care. The boards desire to encourage contractors to adjust costs under individual contracts, wherever there would otherwise result an excessive overall profit margin for the company. This may avoid the need of overall readjustments by the price adjustment unit to which the company has been assigned for review.

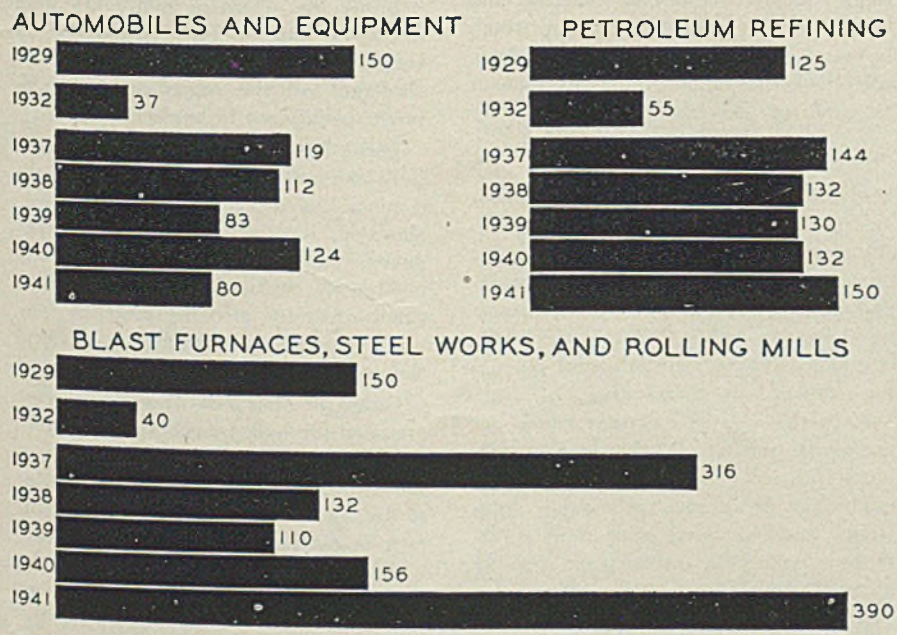
"The agreements on reduced profits usually cover fiscal periods, and so require estimates on the unfilled portions of the contracts. However, it is the policy to allow original agreements to stand unless the actual figures with respect to such factors as costs, volume of production, or nature of product prove to be materially at variance with the estimates upon which the settlements are based. In the final review, if it is shown that increased profits have resulted from extra effort by the contractor to reduce costs or increased production, consideration will be given to this factor.

Army Operations Decentralized

"The Navy and Maritime boards handle all their cases in Washington. The Army board, however, is decentralizing its operations as much as possible. Price adjustment sections will function in the field procurement offices, as well as in Washington, in behalf of the supply services and the materiel command of the Army Air Forces. This should relieve much congestion and obviate the need for many company executives to travel to Washington for renegotiations.

"This decentralization leaves the War Department board, which is responsible

Capital Expenditures Compared



CAPITAL expenditures for manufacturing plant and equipment during 1941 are estimated at slightly more than $5,000,000,000, exceeding the 1929 figure by 83 per cent and nearly nine times the amount spent in 1932. Recent outlays have been caused primarily by the need for additional war plant facilities and have been financed extensively by federal funds. Above charts, prepared by National Industrial Conference Board from data by the Department of Commerce, show capital expenditures in three selected industries

to the Under Secretary of War, concerned primarily with governing policy and procedure of its underlying price adjustment sections, whose recommendations and findings it will review. It will assign companies for renegotiation proceedings.

"The War Department board will conduct renegotiation with any company whenever because of the size of the company, the dollar volume of the contracts involved, the number of contracting services interested, new questions presented or for any other reason it appears that renegotiation by Price Adjustment Sections of the Supply Services or the Materiel Command of the Air Forces is impracticable."

The price adjustment boards will proceed on the belief that it is not the intention of industry to reap undue profits on war contracts and that where contract prices are found too high that the cause was lack of foreknowledge of costs and due to increased volume of output with consequent reduction of unit costs.

"The renegotiation program really is a tribute to the mass production proficiency and progressive technology of American industry.

"Numerous war contracts were rush-order jobs where there could be little foreknowledge of costs, but actual experience now supplies a realistic measure of these costs. Hence the renegotiation program is primarily in the nature of a reappraisal of costs."

Ceilings Over Prices of Idle and Frozen Inventories Established

WASHINGTON

FORMULAS designed to simplify the pricing of idle or frozen materials sold under Priorities Regulation No. 13 are established in Maximum Price Regulation No. 204, issued by OPA.

The price regulation is based on the principle that no purchaser of idle or frozen inventories should pay more than he would be forced to pay had the goods been purchased from his regular supplier.

The new regulation provides:

1. Wherever a specific dollar and cents maximum price exists which is applicable to the sale of idle or frozen materials by their present holder, the maximum price established by such regulation shall apply.

2. No maximum price is provided for sales to the original supplier of the material, or to another producer of the material on the grounds that the original supplier or other producer must resell at an established ceiling.

3. In the case of materials sold to any other authorized buyer, for which no specific maximum price in dollars and cents terms exists, and which are sold in the same form in which they were originally purchased, the seller shall ascertain the maximum price which the original supplier is permitted to charge for the same or similar material and apply that maximum price to his sales.

4. In cases where the original seller no longer exists, or no longer sells the material in question, the seller of idle or frozen materials is permitted to charge a price not in excess of the actual delivered cost to him.

5. Idle or frozen materials which have been fabricated, processed, or otherwise altered, or alloyed, assembled, mixed or otherwise combined so that they no longer are in the form in which originally purchased by the seller, are put in two classes for pricing purposes.

In the first class are materials which have been fabricated or combined into a form in which other producers will find them readily usable for further fabrication or assembly. In such cases, the regulation permits the seller to receive a price equal to his cost of materials and labor, plus the percentage markup which he would have received had he been permitted to complete the fabrication or assembly into his normal product.

May Be Sold at Scrap Prices

In the second class are materials which are not usable in their existing state in any currently permissible productive process. Since the fabrication or combination which has taken place possesses no economic value under present circumstances, these materials must be sold for scrap or salvage purposes.

6. In the case of materials which are not usable and for which a definite maximum price for sale as scrap has been established by a maximum price regulation, that maximum price shall apply. If there is no OPA ceiling price, and the material is sold to a scrap dealer, no maximum price is established by the regulation. This is in line with the provisions of Supplementary Regulation No. 1 to the General Maximum Price Regulation.

However, if the materials are sold as scrap to industrial consumers and if there is no specific maximum price for their sale as scrap, waste, or salvage, Regulation No. 204 establishes a maximum price equal to 80 per cent of the delivered cost of the material to the seller.

A provision is contained in the new regulation whereby OPA can grant exception from all price regulations for the sale of materials to a government agency under the terms of any government program for the purchase of surplus stocks.

Maximum Loading of Freight Cars Required by ODT Order

More efficient utilization of railroad freight cars and locomotives is sought in an order requiring maximum loading of cars carrying civilian freight, issued last week by Joseph B. Eastman, director, Office of Defense Transportation.

General Order No. 18, which becomes effective Sept. 15, prohibits railroads from accepting for shipment, with certain exceptions, any freight cars which are not loaded either to their marked load limit or to their full visible capacity.

Tank cars, flat cars, and cars containing less-than-carload freight are excluded from the order's provisions.

"Conditions are such," Mr. Eastman said, "that even now railroad motive power is being used close to capacity. The heavier loading of the cars which will result from this order will do more than save cars. It will also save motive power, a result presently more important."

Declaring that troop movements and war freight will continue to increase in volume, Mr. Eastman said ODT must anticipate also a further diversion of freight from truck lines as a result of the shortage and the retirement of equipment that cannot be replaced.

Order divides freight into two classes, bulk and nonbulk. Bulk freight means commodities which have to be forked, shoveled, scooped or mechanically conveyed. Nonbulk freight is defined as any commodity enclosed in containers which can be handled piece by piece, or "any other commodity not included within the term bulk freight."

Order provides that where closed cars are used for bulk freight the commodity must be loaded to within 18 inches of the car roof as measured at the sides of the car or to the marked limit, whichever is the lesser. In the case of cars with lined or sheathed side walls, the loading must be confined to a point where the commodity will not spill over the sheathing. Full use of all possible stowage space is required in the loading of nonbulk freight.

Provisions of the order may be disregarded in cases where maximum loading would create a transportation hazard, or result in damage to the lading.

WPB Investigation Disproves Charges Of "Black Market" Steel Operations

WASHINGTON

NO EVIDENCE that "black market" operations exist in the steel or steel warehouse industry was disclosed by an investigation by the WPB Compliance Branch. The investigation resulted from charges made by Frank Higgins, an associate of Higgins Industries Inc., New Orleans, before a congressional investigating committee recently that a "black market" existed in the steel warehouse trade and that the warehouses were bulging with all types of steel that could be obtained by paying a price above the ceiling set by OPA.

The Compliance Branch reported that there was no indication that steel products had been shipped to the Higgins company in violation of WPB orders.

The investigation showed, however, evidence that some steel warehouses, in addition to the 22 penalized last spring in other cases, may have violated WPB quota regulations.

As result of the latter indication, the Compliance Branch will intensify its current warehouse survey to ascertain all the facts. If additional violations are uncovered, punitive action will be initiated against the violators.

During the course of the investigation, members of the Higgins family agreed that the term "black market" had been used ill-advisedly. Andrew Higgins Sr., head of the firm, was quoted: "I wouldn't actually say there is such a thing as a 'black market' by that term for it is business as usual. There is nothing illegal technically or otherwise in the selling spoken of. It isn't even vaguely a 'black market'."

Admits Jobbers Deserve Premium

In making use of the term "black market," Frank Higgins said he meant there is now and has been for some time, available to the Higgins Industries Inc., a supply of various iron and steel products.

"This steel is offered to Higgins Industries and other consumers by salesmen representing steel warehouses," the Compliance Branch reported. "Several lists containing such offers were supplied to the investigators. All of these offers stipulated that orders must be placed in less-than-carload lots, and the steel was priced at the LCL price prescribed by Price Schedule 49, which is considerably higher than the mill price set in Price Schedule 6.

"Frank Higgins also stated that Higgins Industries Inc. was unable to obtain prompt deliveries by placing their steel orders directly with the mills, and they were thus forced to split their orders and purchase through warehouses at the higher prices."

Andrew Higgins Jr., who is directly concerned with placing orders for the company, acknowledged that warehouses were entitled to a higher price than the mills to cover handling and storage costs. He said it was more convenient for the company to buy through warehouses as this eliminated necessity for scheduling requirements far in advance.

Excluding possible violations of the price schedules prescribed by the OPA, the statements and information submitted by members of the Higgins family to the WPB investigators, the Compliance Branch reported, offered no evidence of "black market" operations as the term is commonly understood in this country and in England. No evidence was presented that scarce materials have been diverted from the war program, and all the deliveries cited by Higgins were made pursuant to high-rated defense orders.

Three Possible Violations

"No evidence has been submitted by Higgins of violations of the orders and regulations of the War Production Board," the Compliance Branch continued. "There are, however, three types of possible violations which may be developed as a result of the investigation now being undertaken:

"(a) Warehouse quota violations. Supplementary Order M-21-b prescribes a quota for all steel warehouses and prohibits any such warehouses from receiving steel in excess of its quota. If, as Higgins charges the warehouses of the country are bulging with steel of all types and sizes, this steel may have been received by the warehouses in violation of the quota restrictions. An analysis of the reports compiled as a result of a recent Compliance survey of steel warehouses will disclose whether or not such violations have occurred. A further check will be made of the particular warehouses cited by Higgins.

"(b) Shipments of greater than carload lots. Supplementary Order M-21-b, as amended May 4, 1942, provides that "no warehouse shall make a delivery to any one customer to one destination at any one time from warehouse stock in quantities representing a minimum carload or more, except on specific approval of the War Production Board." The evidence submitted by Higgins of deliveries pursuant to split purchase orders indicate possible violations and attempts to evade this provision by two or three steel warehouses. The Compliance Branch is investigating in detail the operations of these warehouses to determine whether or not their practices constitute such a violation.

"(c) Referring of deliveries to warehouses over other consumers. Higgins stated that his company was always able to obtain its steel requirements promptly from warehouses at LCL prices, but was unable to place a mill order for steel and obtain a reasonable delivery date. This charge carries with it an inference that deliveries to steel warehouses have been preferred by steel producers. Some evidence of this was disclosed in the investigations recently conducted by the Compliance Branch, which resulted in consent decrees against two of the largest steel companies of the country. A further investigation will be made by the Compliance Branch of the receipts of the warehouses in question for the purpose of determining whether or not they have been favored by steel producers."

Houston Steel Operator Accused of Price Violation

OPA attorneys in Cleveland last week obtained a temporary injunction against Willard P. Markle, Houston, Tex., steel distributor, whom they accused of selling steel to the Higgins Industries Inc., New Orleans shipbuilders, at above ceiling prices. The case was an outgrowth of charges by Frank Higgins, an associate in Higgins Industries, before a Congressional committee that a "black market" existed in the steel warehouse industry.

OPA spokesman said Mr. Markle sold the steel at about $20 above ceiling prices, and estimated his profit at about 68 per cent.

Mr. Markle said the steel was fabricated and that he knew of no ceiling prices for such material.

"Those men are talking through their hats when they say I made 68 per cent profit," he declared. "I sold at prices based on cost plus freight, allowing a small profit for myself. I am convinced I was helping out on defense."

Mr. Markle said he was approached by a number of manufacturers "who told me I would be helping defense if I could get them steel that they needed quickly.

"I contacted 55 warehouses, principally in Chicago, Detroit, Buffalo and Cleveland.

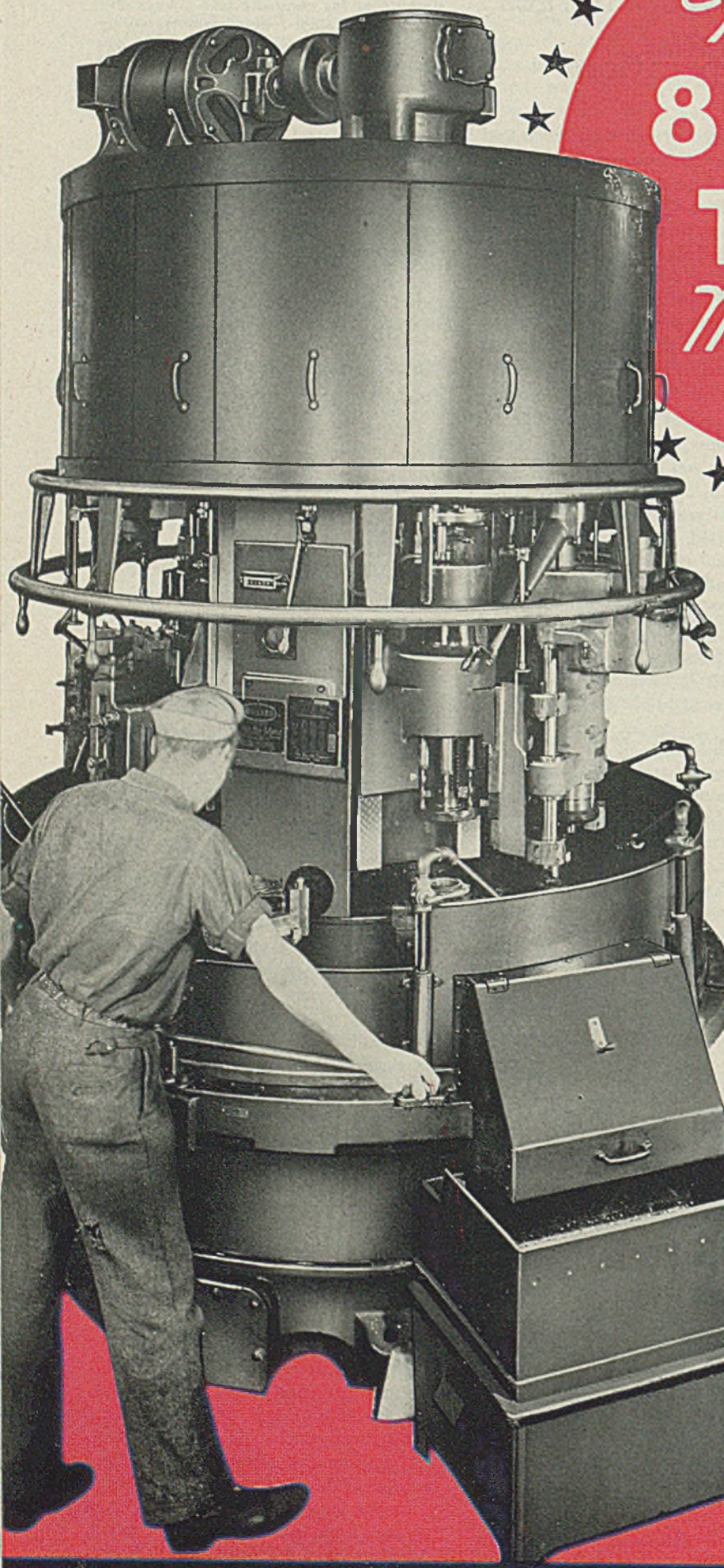
"By going to the warehouses and ordering it fabricated, I could get it immediately. The warehouses charged ceiling prices plus freight, plus the cost of waste, which is heavy in these operations."

Offers Chart of Chemical Compositions of Steels

American Steel & Wire Co. has produced a new chart giving chemical composition limits of AISI, SAE and NE (National Emergency) standard steels. Nearest aeronautical material specifications are included. Size is 14 x 22 inches.

Copies may be obtained without charge from Advertising Department, American Steel & Wire Co., 408 Rockefeller building, Cleveland.

He's An 8-MAN TEAM Mr. Nelson!



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BRIDGEPORT, CONNECTICUT

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

MIRRORS of MOTORDOM

DETROIT

Huge military truck order placed by the Army . . . All is not lost in Detroit, critics to the contrary . . . Ordnance wants 1500 engineers . . . Invasion taxi abuilding

BIG figures come easy these days. Millions and billions are tossed around with gay abandon. One statistician has figured that appropriations for war expenditures made since Pearl Harbor are within a few million dollars of total expenditures made by the national government from the time of George Washington up to Dec. 7, 1941.

Latest big-digit to rock the motor industry is the purchasing by the War Department of some 880,000 trucks and trailers for military use, involving expenditure of $1,500,000,000. (Page 34).

This huge volume of military transport exceeds the entire production of medium, light and heavy trucks for 1937, although it falls short of the 1,042,085 units built last year. However, since May 31, all civilian truck production has been stopped, so the full resources of the commercial vehicle industry, with the exception of some bus production, are available for the military.

In a recent speech, I. B. Babcock, president of Yellow Truck & Coach Mfg. Co. and chairman of the governing board of the military vehicles division of the Automotive Council for War Production, stated, "We won't be in this war so very much longer before our armed forces and their allies will have almost half as many American-made vehicles as there are trucks registered in the U. S." (Truck registrations for 1941 totaled 4,911,000.) Last December a spokesman for the truck industry said the 1941 program of military truck production called for 389,000 units. Since that time, of course, the size of the U. S. Army has been greatly expanded and the need for motorized equipment likewise stepped up.

So, even though the program now under discussion represents over twice the production of military trucks last year, and even though fields and lots in various strategic locations throughout the country are even now packed full of military trucks—gassed, oiled and ready to go—the program of new construction probably is not out of line with needs of the services or outside the ability of the truck industry to produce, especially in view of the suspension of civilian truck output. Further, there has been no inkling as to what period of time the projected 880,000-unit order will cover. It might be a year, possibly two.

One thing which does appear certain is that many new subcontractors are going to be drawn into the truck production picture. Principal reason for this is the switch from steel to wood for many types of bodies. Another is the fact that more emphasis is going to be placed on special types of transport, such as half-tracks and the like, which will call new suppliers into the project to supplement present sources for this equipment. To furnish wood bodies, some of the furniture manufacturing companies may be able to help, relieving to a degree the pressure on companies like Budd which have been rushed to keep up with demand for steel bodies.

Auto Plants Producing War Goods at $5,000,000,000 Rate

The distorted picture of industrial Detroit presented recently in a national magazine had wide repercussions throughout the motor industry which in the public mind is synonymous with Detroit. General opinion is that, while there are bad spots here and there, particularly on the labor side, overall conditions are no worse than in any other large industrial area, and in fact may be a lot better.

Alvan Macauley, president of the Automotive Council for War Production, takes issue with Detroit critics by pointing out that the industry this month is turning out war material for the U. S. and its allies at a rate of $13,600,000 a day and at an annual rate which exceeds by more than 20 per cent the average pace achieved in the peak of civilian production. War production in July was 2½ times that of six months ago and production levels today are far beyond what either the government or the industry itself thought possible at the first of the year. The following tabulation, covering 205 major automotive plants, shows progressive increases in monthly deliveries of war goods:

Month	Deliveries	Annual rate
January	$172,734,000	$2,072,808,000
February	194,851,000	2,338,212,000
March	257,168,000	3,086,232,000
April	286,883,000	3,442,596,000
May	293,626,000	3,523,512,000
June	373,363,000	4,480,356,000
July	413,712,000	4,964,544,000

To single out the Willow Run bomber plant and say that it is typical of Detroit because it has not yet turned out a single complete bomber is just plain nonsense. No Ford official has claimed any ships have been built in their entirety—yet. It takes time to build up backlogs of parts, or "floats" as the industry calls them, and it takes time to start wings and fuselages through the long lines of assembly jigs in the vast plant. It may be necessary to have as many as 100 planes in varying stages of construction before the first one comes off the end of the line.

A similar answer can be given to the latest carping of J. H. Kindelberger of North American Aviation who again has thrown the harpoon into the automotive industry, charging it has yet to complete a single airplane. As a matter of fact, outside of the Ford Willow Run project, no automotive plant has been assigned the task of building complete planes. Lately Nash-Kelvinator has undertaken a flying boat job, but this is too recent to be included. Rash statements like those of Mr. K., and defamatory articles like the one previously mentioned serve no useful purpose unless it be, like the remarks herewith, to fill up some blank pages with print.

The automotive industry's backlogs of war orders now are believed to be better than 12 billion dollars, of which General Motors is said to have around 6 billions, and Ford something under 4 billions. The Ford share is unusually large, considering its normal portion of the automotive market; which makes the job Ford is attempting to do all the more noteworthy. A brief run down the list of war projects in Ford plants shows an amazing variety—military trucks, jeeps, amphibian jeeps, bombers, bomber engines, tanks, two models of in-line engines for tanks and airplanes, "battle wagons," mobile gun carriers, armor plate, Sperry directors and gliders are the principal items, some still to get into production. Not much has been said about gliders at Ford, but they are understood to be multiplace ships for the Air Forces, to be built at a Ford plant in the northern peninsula of Michigan.

The Ford armor plate plant began production within the past few weeks and little can be divulged about this phase of the company's operations except to infer that fabricated and heat treated plate is being supplied for tanks and other armored vehicles, with steel furnished from the Ford open-hearth plant.

Backlogs of war orders are in a con-

tinual state of flux. New orders are added steadily and old contracts are renegotiated as production costs become determined more accurately. On the matter of contract renegotiations it has been the usual policy to renegotiate each individual contract as it comes into production. This appears to be the only practical way to handle the matter, since only after production has started can the true picture on costs and profits be determined. Hence the recent statement from the price adjustment boards of the Army, Navy and Maritime commission is strange.

They state that "the overall profit is taken as the primary basis of renegotiation, and not the individual contracts. . . An operating profit of a given per cent may be too high in one situation and too low in another. Stated simply, such profit is to be related to volume of production." It is difficult to see how overall profits can be renegotiated, since they are determined by the performance on individual contracts. Control of overall profits would seem to be the province of tax laws on excess profits.

The price adjustment boards point out that their work, "in treating with the overall problem, will not obviate the duty of contracting officers (unrelated to the boards) to continue to survey the specific contracts in their care. The boards desire to encourage contractors to adjust costs under individual contracts, wherever there would otherwise result an excessive overall profit margin for the company. This may avoid the need of overall readjustments by the price adjustment unit to which the company has been assigned for review."

This seems to put the burden of contract renegotiation on individual contracting officers, for the specific purpose of relieving the price adjustment boards of the responsibility for haggling with contractors over prices.

Combat-Automotive Center Recruiting New Personnel

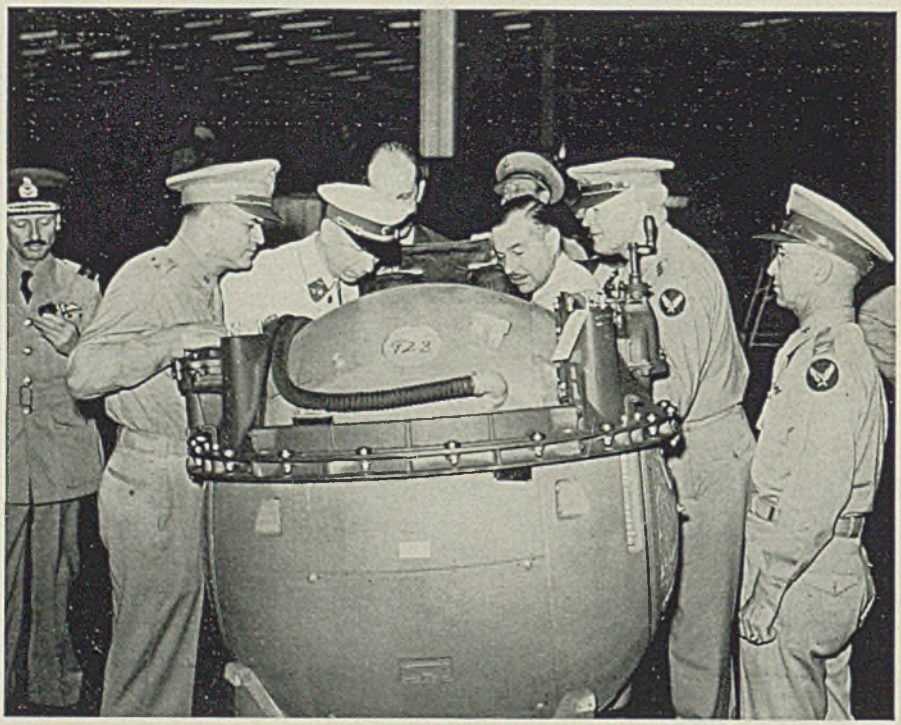
Combat-Automotive center of the Ordnance Department, recently established here by Col. A. R. Glancy, deputy chief of ordnance, now estimates its personnel will number between 2500 and 3500, about half of which will move in from Washington and St. Louis. The balance will be hired here and the section is now looking for mechanical engineers and apprentice draftsmen to build up its staff in the Fisher building, where six floors have been taken over to provide 79,000 square feet of office space and 15,000 feet of laboratory space. Applications should be made at 1600 Fisher building. The Combat-Automotive center is headed by Brig. Gen. Donald Armstrong, former head of the Chicago Ordnance district. The new division is likened to a "vertical slice of the Ordnance Department at Washington." It will have no direct contact with any contractors who will continue to work through the 13 district ordnance offices.

Survey of 25 states and the District of Columbia, handled by the National Automobile Dealers Association, reveals that as of July 1 the decline in passenger car registrations from the same date a year ago, was 3.10 per cent, and in truck registrations 1.62 per cent. Interpolated to a national basis, and adding on losses estimated since July 1, it is figured that restrictions on the use of cars, tires and gasoline have taken about 1,000,000 of the nation's 32,251,737 cars and trucks off the highways. Decline in passenger car registrations in states having gasoline rationing was 3.48 per cent, compared with 2.83 per cent in states with no rationing. One state in the ration area, Virginia, actually showed an increase in car registrations of 1.10 per cent.

Amphibian tractor, or invasion taxi as the Marines call it, being produced in the Graham-Paige plant here, is the vehicle developed by William and Donald Roebling in an effort to provide rescue for persons stranded in marshy lands by floods and hurricanes. Begun in Florida in 1935, the amphibian was first tested on the Virginia coast in 1940, with naval observers on hand. It was immediately put into production in the plant of Food Machinery Corp. and now has been tooled for mass output.

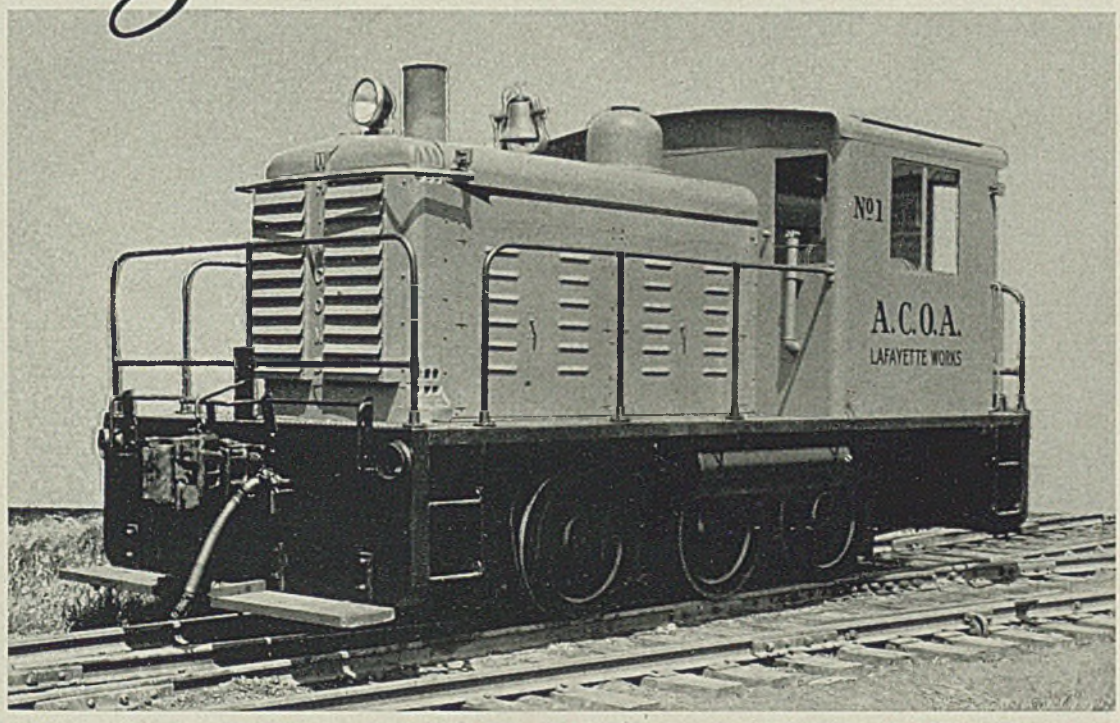
Toothpicks, dish mops, pure mutton tallow, dry ice, canvas foot covers, crash helmets, police whistles and razor blades are some of the odds and ends on shopping lists of the purchasing department at Cadillac. What are they used for in an industrial plant? Well, 100,000 toothpicks recently were requisitioned by the medical department for making applicators, the dish mops are used for applying drawing compound on stampings, dry ice for cooling plating solutions, canvas foot covers for men working inside freshly painted combat vehicles, mutton tallow a lubricant for wooden assembly channels, and the razor blades for cleaning up windows after blacking out with paint. Oh yes, the police whistles; they are used as warning signals to operators of heavy hoists.

Aircraft Gun Turret Power-Driven



FIRST picture to be released of power-driven gun turret being built for the Army Air Forces by Briggs Mfg. Co., Detroit. Turret is described as an aluminum ball about 4 feet in diameter or large enough to enclose a gunner and extending about two-thirds of its diameter outside the airplane. Two .50-caliber machine guns are mounted within and revolve with the entire housing. Group around the turret here, from left to right, comprises Brig. Gen. Benjamin Meyer, of the Army Air Forces; Gen. A. I. Belyaev, chief of Russian Air Forces; H. T. Platz, executive engineer of the Briggs turret division; Lt. Gen. H. H. Arnold, chief of the Army Air Forces; and Col. Alonzo Drake, Central Procurement District, Army Air Forces

WHITCOMB *Locomotives*



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Whitcombs are constantly attacking their own records for economy in operation; for thorough dependability under the worst conditions; for greater efficiency and for minimum maintenance.

These sturdy industrial type Diesel Locomotives absorb the terrific demands made upon them without sacrificing a bit of efficiency or durability. They are always ready to go, standing up under long hours of continuous service day in and day out.

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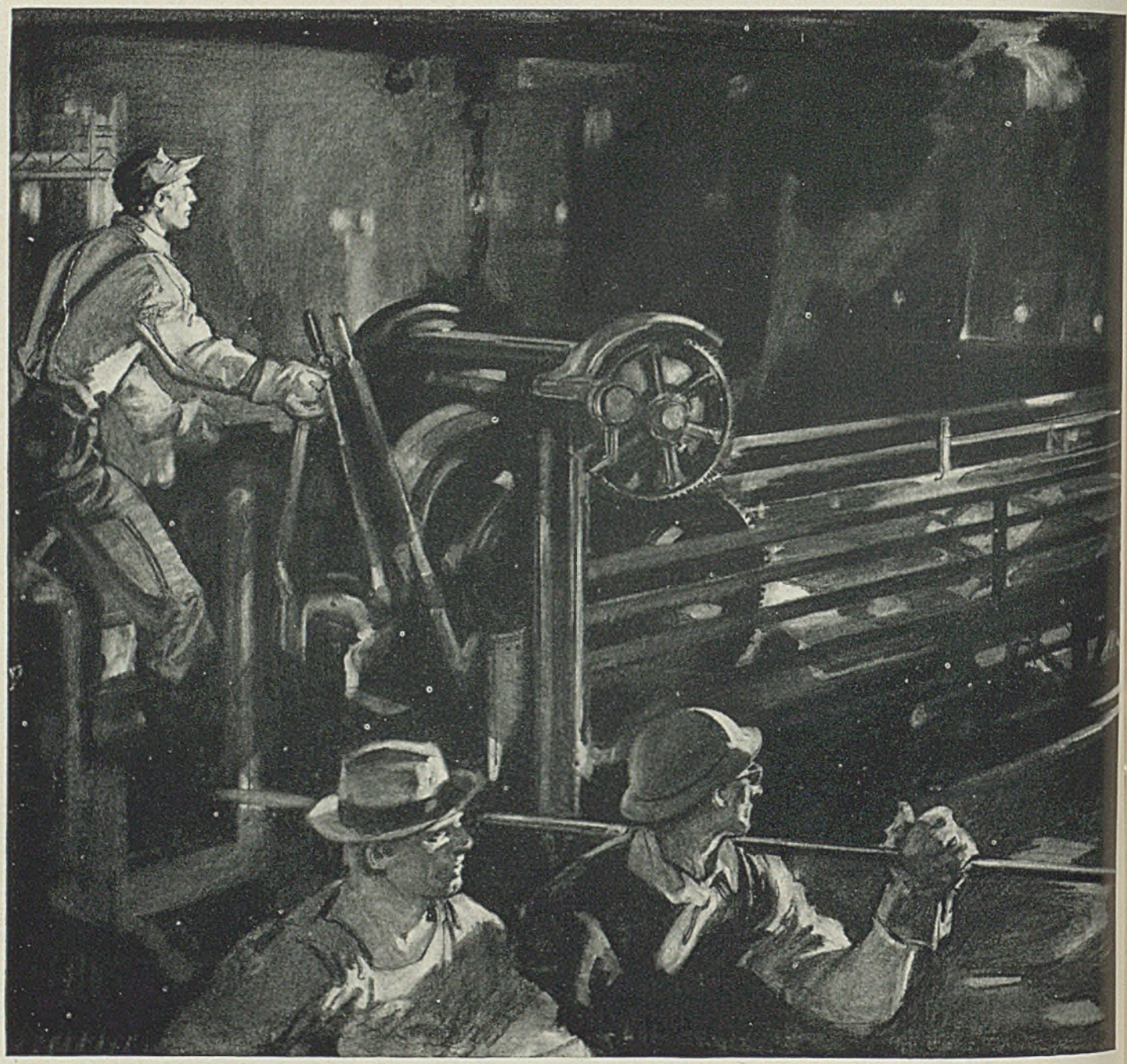

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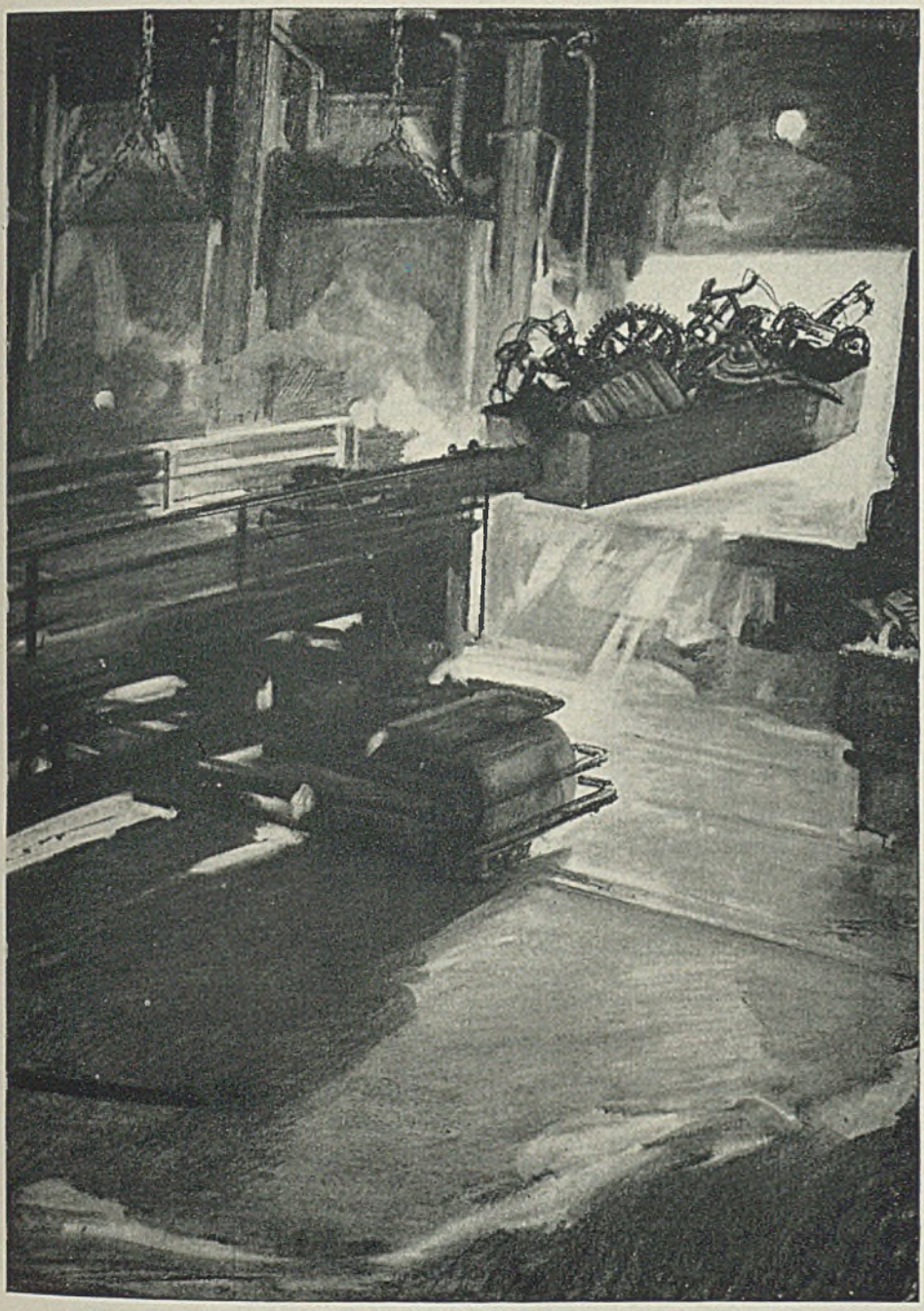
STEEL MEN USE SCRAP FOR MAXIMUM

Like coast artillerymen in action with huge railway guns, skilled steelworkers maneuver their hundred-ton charging machines on tracks up and down the batteries of open-hearth furnaces, charging load after load of scrap metal into the seething cauldrons to make strong, fighting steels. Millions of tons of steel scrap are required to keep these war furnaces going twenty-four hours a day, seven days a week.

In adjoining mill yards trained scrap-men load the charging boxes—rush them up to the charging line. Steel scrap, and plenty of it, is vital to making quality battle-steels at a record breaking pace. In the open-hearth operation scrap quickens the process—makes possible efficient use of the natural resources, iron ore, coking-coal and limestone.

Helping men of steel to obtain scrap now for their



FROM AN ORIGINAL DRAWING BY ORISON MACPHERSON

WAR-STEEL PRODUCTION

war furnaces enlists every industry and business — every farmer and householder. It partners everyone with the steel workers who are fighting this war with their skill and will-to-do.

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH, PENNSYLVANIA

PARTNER TO INDUSTRY IN WAR PRODUCTION

J&L STEEL

SCRAP

Like "mother" in vinegar, scrap steel in open-hearth furnaces activates and stimulates the process, gets refining action of whole batch going in right direction, particularly charge of new molten iron.

½ a battleship, or tank, or sub or big gun is iron or steel scrap that used to be in a discarded tractor, toy, rake, plough, kettle, tool, machine, auto, bathtub, refrigerator. The steel industry in general operates on the basis of 50% scrap, 50% pig iron. Scrap is sorely needed in the war production program. There are millions of tons of it rusting in factories and shops, on farms, in stores, around dwellings. A nationwide campaign is on now to collect and sell to scrap dealers this waste material so essential to winning the war.

The scrap dealer, who pays for waste material turned in to him by individuals, industries or civic and charitable groups, sells it in turn to industry at established, government-controlled prices. However, to make waste material usable for the mills the scrap dealer must properly sort, grade, prepare and bundle it, and also accumulate it in quantities sufficiently large to be shipped efficiently.

Hit Hitler with junk! Every piece of waste iron, steel, copper, brass, lead, rubber, around industrial premises, gathered up and placed where local salvage committees, or Boy Scouts, Girl Scouts, or charity organizations can collect and sell it, will be a blow to the axis.

Industrial executives, with authority to salvage obsolete machinery, tools, dies and all waste that has been created in their operations, are being asked to appoint salvage men, or committees, in their plants to go over the premises with a fine tooth comb and gather the last pound of salvageable junk—particularly iron and steel scrap—which is quickly usable and salable and readily turned into steel greatly needed for war.

Housewives help make bombs by turning in to local salvage committees their discarded appliances of iron or steel. A few hundred worn-out skillets or kettles will make one big aerial bomb.

Gifts of scrap may be made to local charities, service organizations or Defense Councils. If you wish to help government directly, sell your scrap, buy war stamps and bonds.

Obsolete factory equipment, cut up right now and sold as scrap through the regular channels will be a big contribution to our fighting forces. Equipment idle in a factory might also be considered for its immediate salable value as scrap material. The amazing industrial progress going on in America today, rapidly makes obsolete yesterday's machinery and appliances.

Farmers can bomb Tokio, 3 hits per minute for a couple of years, if they will rake up and sell every pound of scrap on the farm.

Activities of Steel Users and Makers

KROPP Forge Co., Chicago, has formed an associate company, Kropp Forge Aviation Co., which will shortly occupy a new plant under construction on property adjacent to the parent concern. A feature of the plant will be mechanical handling of raw materials, finished parts and scrap. Roy A. Kropp is president of both companies.

♦

Commercial Credit Co., Baltimore, and Kaydon Engineering Corp., Muskegon, Mich., have been merged. A. E. Duncan, chairman of the credit company, said the action was an outgrowth of his firm's desire to invest a portion of its resources in financing war production. Kaydon Engineering Corp., producing specialized bearings for war use, will continue under the direction of A. H. Frauenthal, president, and its present management. Facilities of this organization have been expanded several times since production commenced last fall, it was stated.

♦

Penn Metal Corp. of Pennsylvania, Philadelphia, will celebrate the centennial anniversary of its founder, L. Lewis Sagendorph, Sept. 26. Mr. Sagendorph is credited with being one of the first to recognize the importance of pressed metal for the building trades. During his life he obtained 70 patents on processes developed under his supervision. One of his early ventures, Sagendorph Iron Roofing & Corrugating Co., Cincinnati, was purchased in 1889 by the American Rolling Mill Co.

♦

A second expansion within a year is planned by Bissett Steel Co., Cleveland, steel specialty distributor, to increase the firm's warehouse capacity by an additional 18,000 square feet. A line of National Emergency alloy steels has been added to the stock of alloy, aircraft and tool steels and other specialties carried by the company.

♦

Contour Saw Laboratories of the Doall Co., Des Plaines, Ill., was further expanded recently and moved into its own building. The laboratory is a customer-service department devoted to solving problems of narrow blade saw users. Results of tests, with recommendations on materials, blades, jigs, etc., are reported to customers without charge.

♦

The Army took over direct supervision of more than 100 guards in Inland Steel Co.'s Indiana Harbor, Ind., plant, Aug. 14. In a ceremony similar to that conducted in a number of other war production plants in the Chicago area, the guards were inducted as members of the civilian auxiliary to the military police and charged with protecting war materials, premises, and utilities.

Indicative of the extent to which the Army has stepped into the picture is the fact that the members of the auxiliary, upon being received into service, had the Articles of War read to them and by the further fact that they will not be able to give up their duties without formal discharges from the Army.

♦

Aluminum Ladder Co., Tarentum, Pa., has moved its plant and equipment to Worthington, Pa., where the firm now occupies the group of buildings formerly operated by Buffalo Woolen Mills. The company is now engaged 100 per cent on war orders, principally in the manufacture of sheet metal products, both aluminum and light gage steel sheets.

♦

Suprex Gage Co., Ferndale, Mich., has completed a $750,000 expansion program and will be in peak production by Sept. 1. A feature of the new plant is a large temperature control room with a constant 68 to 70 degree temperature.

♦

Ebasco Services Inc., New York, service organization of the Electric Bond & Share Co., has designed an "outdoor" power plant in which main operating parts are exposed to the weather. Only enclosures are those for the operating crews at their instrument panels and controls. Engineers say the design will save 90 per cent of the structure steel required for conventional plants and results in no decrease of operating efficiency.

♦

United States Rubber Co. has received a contract from the Navy Department to build and operate a shell loading plant in North Carolina. The company has created a new shell loading division, headed by Ernest G. Brown as general manager, to handle the assignment. Mr. Brown formerly was production manager of the company's mechanical goods, general products and rubber threads divisions.

♦

Manufacturing sources for $3,201,260 in war goods were located through the WPB regional offices in Detroit, Toledo and Grand Rapids during the month of July. D. J. Hutchins, acting chief of the WPB Detroit region, said ten prime contractors were located for the armed services and that the resulting orders for war materials amounted to $645,806. WPB engineers assisted in locating 88 firms that negotiated subcontracts totaling $2,555,454.

♦

A 300 per cent increase in output of the Tocco division of Ohio Crankshaft Co., Cleveland, has made it necessary for

Bumper Streamers Advertise Bond Buyers

EMPLOYES of Kearney & Trecker Corp. recently appeared on Milwaukee streets with their automobiles bearing "I'm a 10% War Bond Man" streamers on bumpers fore and aft. Ninety-seven per cent of the company's workers are members of the 10 per cent club

the company to lease a two-story factory building in that city to expand production of electrical induction surface hardening and heating machines. The building will increase the division's floor space 50 per cent.

♦

Monthly sales of special steels by Allegheny Ludlum Steel Corp., Pittsburgh, in July reached $9,250,000, an increase of 23 per cent over the 1941 average. The increase resulted from additional electric furnaces and other facilities and from "War Production Drives" in the company's plants.

♦

More than 2600 General Electric employes entered the armed services in May and June, bringing the total to 7653, or 7.4 per cent of all the company's male employes.

♦

Taylor-Davis Inc. has moved its offices and plant to new quarters at the foot of Righter's Ferry road, Pencoyd, Lower Merion Township, Pa.

♦

Gisholt Machine Co., Madison, Wis., announces the following new appointments to its field sales and service personnel. Direct sales representatives and agents: Ray Hering, 1817 N.B.C. building, Cleveland, co-operating with Roy Hunter and C. B. Carr; Earl K. Baxter, 5-168 General Motors building, Detroit, co-operating with U. S. James; B. C. Creene and Steel & Machine Tool Sales Inc., Houston, Tex.; Dawson Machinery Co., Seattle; Foulis Engineering Sales Co., Nova Scotia, New Brunswick, and Newfoundland territories, headquarters at 321 Capitol building, Halifax, Nova Scotia.

Direct service representatives: John T. Murray, 1620 Mutual Home building, Dayton, O.; Grover Pruett and Philip E. Denu, 1060 Broad street, Newark, N. J.; Alfred Math Kuehn, Lockport, N. Y., Pittsburgh and Toronto, Canada, territories, with headquarters at 329 Bewley building, Lockport.

Agents' sales representatives: D. O. Vincent, Atlanta, Ga.; D. M. Ward, covering southern Georgia and Florida, headquarters in Jacksonville, Fla.; Gordon N. Russell Ltd., British Columbia territory, headquarters at 744 Hastings street West, Vancouver; C. B. Spalding, Windsor, Ont.

♦

Cleveland Graphite Bronze Co., Cleveland, will receive $7,000,000 from the Defense Plant Corp. to purchase new tools for an expansion program to increase production of certain aircraft parts. Expansion will require a heavy increase in employes who will work a 48-hour, six-day week with swing shifts to keep the plant in continuous production. Preferred stockholders will be asked to approve a $5,000,000 bank credit to be used principally for carrying increased inventories and accounts receivable.

Hits "Bull's Eye"

FOR BEING the first firm in the United States to have more than 90 per cent of its employes subscribe for war bonds in excess of 10 per cent of their pay, Ex-Cell-O Corp., Detroit, recently was awarded the first "Bull's-Eye" flag to be presented by the United States Treasury. Photograph shows Murray D. Van Wagoner, governor of Michigan, congratulating Ex-Cell-O's nearly 10,000 employes upon their patriotic achievement. His remarks are being applauded by Phil Huber (left), president of the company, and by guest-of-honor Lieut. Jack Sims, U.S.A. of Kalamazoo, Mich., one of General Doolittle's navigators during the famous air-raid over Tokyo

Steel Plant Blackout Leaves Only Slight Glow

Bethlehem Steel Co.'s Lackawanna plant at Buffalo came within one slight glow of refuting the contention that it is impossible to blackout a steel mill without suspending operations during a practice of the company's air raid protection plan last week.

STEEL's correspondent accompanied Plant Superintendent Edward F. Entwisle to an observation tower overlooking the huge properties when the plan was tested. When the alert signal was flashed the entire area was thrown into darkness, except for the faint glow of hot ingots in one open hearth division.

The big strip mill could not be seen from the tower, 133 feet high. Neither could the open hearth division, nor the 100 miles of railroad tracks.

The test resulted in no decrease in steel production, according to Mr. Entwisle.

Government To Acquire River Barge Fleet

PITTSBURGH

Defense Plants Corp. has formulated a plan for expansion of petroleum carrying by river barges, according to sources here, which includes conversion of a large number of steel cargo barges and the construction of a fleet of wooden barges.

Sixty steel barges, comprising the fleet of Inland Waterways Corp., government transportation operators on the Ohio-Mississippi system, will be the first to be converted. An additional 200 steel barges will be purchased from independent fleets, the total having a carrying capacity of 2,500,000 barrels of oil. After conversion, which is to be carried out by Inland Waterways, the barges will be purchased outright by Defense Plant Corp., and will be allocated to various barge lines on a charter basis.

The cargo carrying capacity of these converted units will be replaced by a fleet of wooden barges, to be built under the direction of DPC. Two sizes will be built, about 200 units of each size. In addition, it is understood DPC will shortly launch a construction program whereby United States Army Engineers will supervise construction of a number of wooden oil barges for service on Gulf coast and Atlantic seaboard via the inland waterways.

Women chemists are being employed in an expanded research program at the central experiment station of Hercules Powder Co. at Wilmington, Del. A night research shift has been established to broaden the work without adding further to buildings while materials are scarce.

Canada Prohibits Hoarding of Iron, Steel Products

TORONTO, ONT.

TO SUPPLY rising war demands for iron and steel scrap, the Department of Munitions and Supply has prohibited the hoarding of these materials in Canada, whether in the form of machinery or as scrap. The order, issued by F. B. Kilbourn, steel controller, provides that, without a permit, no person may retain in his possession after Sept. 15, any scrap metal weighing 500 pounds or more. Scrap dealers and scrap consumers are not affected.

For the purpose of the order scrap metal includes machinery, structural steel or any other article or commodity containing iron or steel, which is not serving an immediate vital purpose.

"Although the order is broad enough to take in passenger cars and trucks not now in essential use, it is not our intention to order the disposal of such vehicles," Mr. Kilbourn stated.

"We will, however, insist on the application of the order to vehicles which are in automobile graveyards."

Steel in partly completed buildings, and machinery now in actual operation in nonwar plants, are covered by the order, but will not at present be affected. "The object of the order," Mr. Kilbourn stated, "is to compel the disposal of old or obsolete machinery, or scrap metal, which has been held for a better price, or because of some imaginary future need. Such hoarders will be dealt with severely if they do not comply with the regulation."

The order also provides that if anyone, after Sept. 15, comes into possession of scrap metal weighing 500 pounds or more, he must dispose of it within 20 days. If the owner of a machine, or other metal defined in the order as scrap, believes that he cannot dispose of it by Sept. 15, to a national salvage committee, or any recognized salvage agency, or if he believes he would be serving a useful purpose by retaining it, he must send in a report to the Used Goods Administrator of the Wartime Prices and Trades Board in Toronto. His report must reveal the description, quantity and location of the scrap metal. After Sept. 15, anyone, other than a scrap dealer or consumer, who is in possession of scrap metal weighing 500 pounds or more, which he has not reported, will be subject to a fine up to $5000, or imprisonment up to five years, or both.

"The time has come," Mr. Kilbourn stated, "when the shortage of steel calls for drastic measures. Nearly half a million tons of scrap are needed to produce steel for ships, guns, tanks, planes and other war supplies. It is essential that we obtain that scrap."

Releasing the above order, Mr. Kilbourn made special reference to farmers. He stated that farmers must dispose of any machinery in their possession which is not now in use. "Farm machinery which is employed for seasonal purposes is not affected, but if a farmer has a machine which he will never use again, he must dispose of that machine at once. If he can sell it as a usable machine, so much the better. If not, then he must either sell it or give it away for scrap."

New Tank Gun in Production

Canada has started production of a new and improved rapid-firing tank machine gun, according to C. D. Howe, Minister of Munitions and Supply. Known as the Browning 0.30 calibre tank machine gun, the new weapon is being made on the latest design of the United States Army experts. It will be fitted to tanks for Canadian, as well as British and Russian use. Simultaneously, the minister announced, Canada is speeding up the monthly output of Browning aircraft machine guns. He stated: "Now that we have completed most of our plant expansion, we are fast approaching all-out production. Evidence of this is contained in the production figures for the Browning aircraft machine gun. More than half the total quantity of these guns so far produced in Canada were turned out during the past three months."

War contracts on an ever increasing scale are being placed by the Department of Munitions and Supply, covering all lines of war materials. The comptroller of the treasury stated that outlays by the federal government for war purposes during July amounted to $302,858,779 of which $190,358,779 was on Canadian account and $112,500,000 to finance expenditures of the United Kingdom. As a result of the July expenditures, more than half of Canada's $1,000,000,000 "gift to Britain" has been used up, with total expenditures in this regard since April 1 at $548,928,633. Canada's direct war expenditure over and above this sum was $671,612,820 in the same period. Total Canadian government receipts from April 1 to July 31, were $742,059,633 compared with $484,250,397 in the same period in the previous fiscal year.

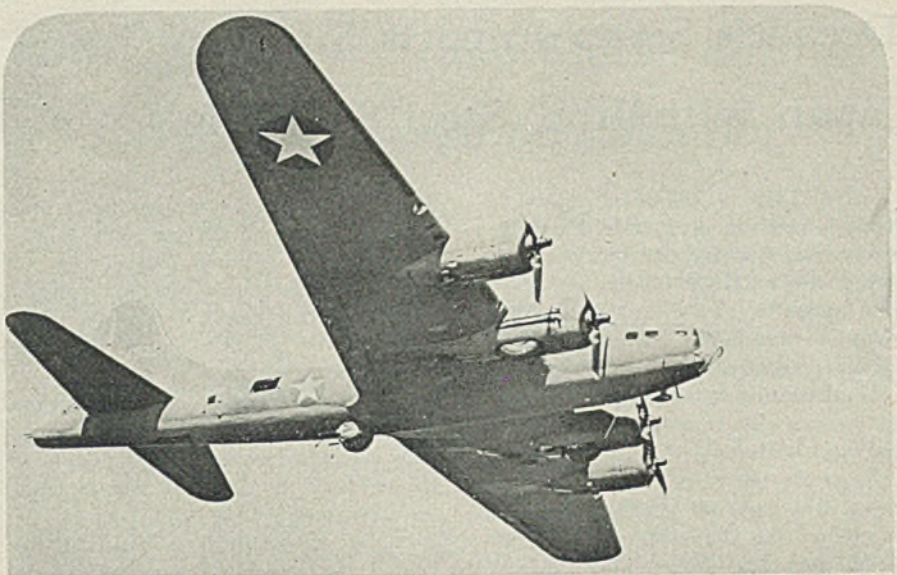
Shipbuilding contracts totaling $140,000,000 have been authorized for British Columbia shipyards, which are in addition to the $261,000,000 in contracts previously awarded to shipbuilders in that area. The new awards include both cargo and naval vessels as well as smaller craft.

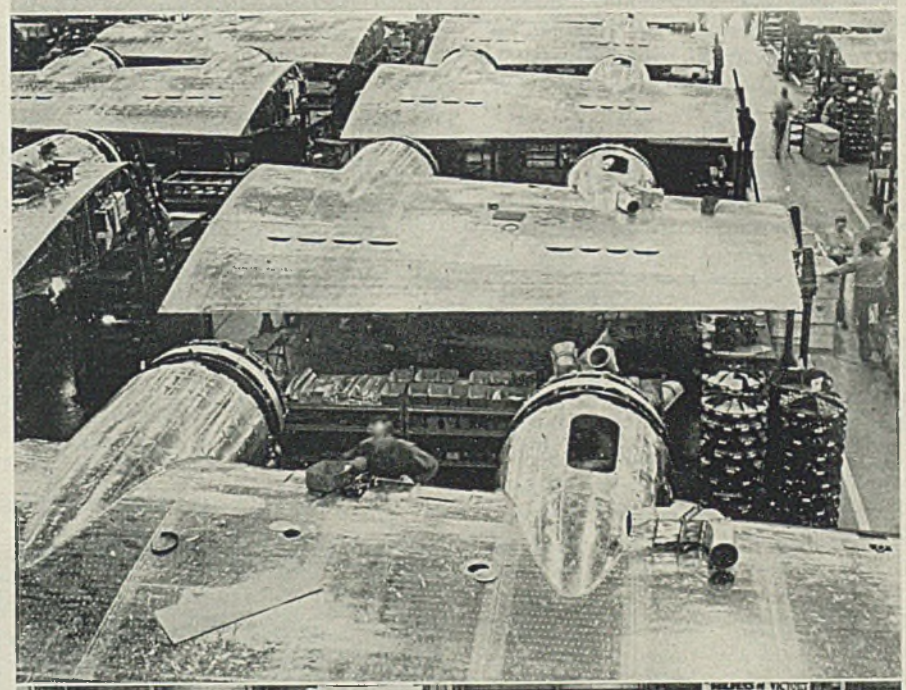
Veteran Sawmaker Meets Tokio Bomber

GEORGE METZGER, 85 years old and for 72 years an employe of Henry Disston & Sons Inc., Philadelphia, talks with Lieut. Thomas C. Griffen, Army Air Force flyer who bombed Tokio with Gen. Jimmy Doolittle. Left to right: Lieutenant Griffen; Mr. Metzger; George Jeffrey, Disston personnel director; S. Horace Disston, president of the company; and Maj. R. D. Walsh, Army Ordnance Department

Flying Fortress Output Doubled Since Dec. 7

EIGHTH in a long line of four-engined Flying Fortresses is this latest model produced by Boeing Aircraft Co., Seattle. Top of page, a completed plane is given a test flight over Mt. Rainier near Seattle. Center photo shows wing line where motors and many other items are added. Photo shows inboard section; outboard section of wing is constructed in a different plant. Lower photo shows long rows of fuselages, awaiting wings and engines and guns. Boeing has more than doubled production of Flying Fortresses since Pearl Harbor. NEA photos





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Kindelberger Says Huge Cargo Planes Impractical

Huge cargo planes, such as the 200-ton model proposed by Henry J. Kaiser, and the 70-ton Mars, are impractical according to J. H. Kindelberger, president, North American Aviation Inc., Inglewood, Calif. He estimated five years would be required to get into production of the 200-ton model.

Mr. Kindelberger, in a conference with newsmen in Washington, urged maximum production of the current new types of proven transports, the 32-ton four-engined craft.

He declared "the present type of cargo plane is as good as we can get" and that "there are no better carburetors, propellers or wings than are in production." Regardless of size, he said, airplanes require proportionately the same amount of gasoline to carry a ton of cargo the same distance.

"Burn Another Inch, Build Another Ship"

Recommendation that welders use electrodes down to a 2-inch stub was made last week by Lincoln Electric Co., Cleveland.

Although every 14-inch electrode can be turned to this length stub, workmen sometimes throw away 3 1/3 inches, and some even discard as much as 6 inches.

Use of merely another 1 1/3 inches on the average stub would be sufficient to add another 5½ boats to the nearly 60 are welded cargo vessels being turned out in the United States each month.

If the average ship welder discarded a 6-inch stub, the company estimates, enough electrodes to weld 25 ships a month would be wasted.

A. E. Davis, Lincoln vice president, recommends the slogan: "Burn Another Inch and Build Another Ship."

Decade's Scrap Imports Supply Japan with Iron, Steel Stockpile

"ANALYSIS of published reports of Japanese production of pig iron and steel ingots since 1930 indicates the possibility that a substantial part of the tonnage of scrap imported in the past decade may today be constituting a stockpile for the Japanese steel industry."

The foregoing statement is from a current news release from the American Iron and Steel Institute.

"Over the ten years 1931-1940, Japan imported a total of 11,600,000 tons of scrap from the United States, and additional tonnages from other sources. Furthermore, Japan, like this country, produces scrap as a by-product of fabricating steel products into finished commodities."

In a comparison of United States and Japanese production, the institute says:

"American steel plants are now producing about as much steel every month as the steel industry of Japan can turn out in a whole year.

"For more than a year the total tonnage of steel ingots produced in the United States has averaged about 7,000,000 tons per month, and in some months has approached 7,400,000 tons.

"By comparison, the best available reports indicate that the aggregate capacity of all steel plants in Japan proper, occupied China, and Manchukuo is in the neighborhood of 7,200,000 tons per year.

"On that basis, Japan ranks sixth among the steelmaking nations of the world, trailing behind the United States, Germany, Russia, the United Kingdom and France. Total steel capacity of the United Nations is estimated to be nearly 131,000,000 tons per year, more than twice the capacity of all steel plants in Axis Europe and Japan.

Must Import Alloying Elements

"Available statistics indicate that a very substantial portion of certain major steelmaking raw materials must be imported into Japan by water.

"Japanese iron and steel plants probably can obtain 100 per cent of their requirements of coal and limestone from mines within Japan proper, yet there is apparently a great insufficiency in annual production of other strategic materials like iron ore, manganese, chromium and nickel. Only tungsten, of all the major alloying elements, is available in Japan and Korea in sufficient quantities.

"Mines in Japan, Korea and Manchukuo can produce only about 20 per cent of the iron ore needed to keep the Japanese steel industry running at capacity, only about 20 per cent of the manganese ore required, and only 10 per cent of the chromium ore requirements. Nickel, another essential alloying metal, is not mined in either Japan, Korea or Manchukuo.

"Those percentages are based on the assumption that the wartime demands for alloy steels in Japan are in proportion to the needs of the American war program for alloy steels.

"Before the outbreak of war with the United Nations, Japan imported nearly 80 per cent of annual iron ore requirements from China, Malaya and Philippines. Today, of course, Japanese troops occupy most or all of those areas, but incoming shipments must pass through waters in which American submarines are operating.

"Japan's pre-war sources of imported manganese ore included India, Malaya, China and the Philippines. Of these, only India is now shut off as a source of supply, but the water haul from the other sources is hazardous.

"The 90 per cent of Japan's annual chromium needs which must be imported came principally from India, South Africa, New Caledonia and the Philippines. Of these pre-war sources, only the Philippines is today open to Japan. For nickel, the nearest source of supply to Japan has long been the island of New Caledonia. Since American troops are quartered on New Caledonia, it may be assumed that shipments of nickel are no longer going from there to Japan."

53-Year-Old Saginaw Bridge Turned in by Grand Trunk

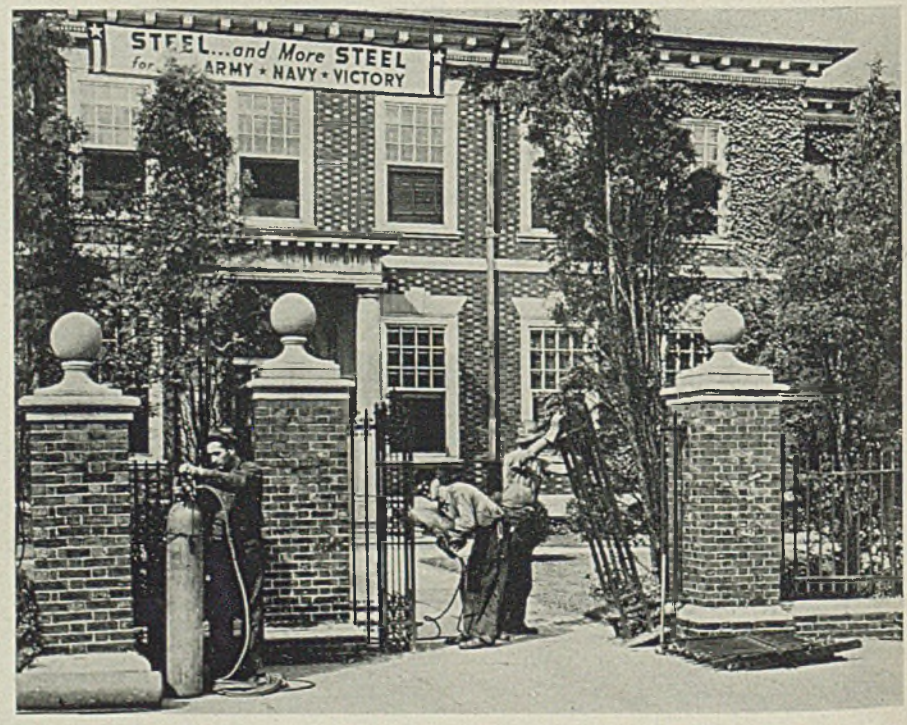
SAGINAW, MICH.

One of this city's historic railroad bridges, the 800-foot span built across Saginaw river by the Grand Trunk railroad in 1889, is being dismantled and turned over to the war production scrap pile. The bridge, located in downtown Saginaw, is the second such structure the Grand Trunk has voluntarily converted to war usage in recent months in this area.

A huge 1400-foot steel span owned by this carrier at Bay City, connecting the east and west sides of town, was dismantled last spring and given to the War Department for use in constructing other bridges, notably one across the Potomac river near Washington.

According to Grand Trunk and WPB

Steel Company Uses Its Fence for Scrap



Robert W. Wolcott, president, Lukens Steel Co., and chairman of the American Industries Salvage Committee which is directing the current national salvage campaign, turns 2275 pounds of iron fence over to salvage. The fence, in use since the front wing of the Lukens' main office was constructed in 1902, is here being demolished by members of the company's riggers' department

officials, the Saginaw bridge has a steel section 346 feet long that contains approximately 180 tons of steel and wrought iron. It is a swing-span structure, with a fixed span 155 feet long and a swinging section 191 feet long.

WPA Workers Collect 100,000 Tons of Scrap

WPA employes have gathered 100,000 tons of scrap metals from rural areas and by removing abandoned street car rails from city streets, Brig. Gen. Philip B. Fleming, federal works administrator and acting commissioner of works projects, reported last week.

From April through July, WPA turned in 54,000 tons of metals collected from farm areas, using WPA or local government trucks. Recently the Army has turned over 100 former CCC trucks to the WPA to be used for scrap collection.

Between last October and June, 44,900 tons of steel rails were removed.

2000 Unused Lamp Posts at Chicago Available for Scrap

CHICAGO

A survey of potential iron and steel scrap being made here at the request of the Office of Civilian Defense has disclosed that the city of Chicago has 2000 unused cast-iron lamp posts which can be removed and made available to the war effort.

These posts, each weighing 350 pounds, aggregate 310 gross tons. It is estimated that cost of salvage, including removal, cartage and subsequent repair of sidewalks and curbs, will amount to approximately $12 each, whereas the posts are worth only about $2.50 as scrap.

The proposition will be brought to the attention of the newly-organized War Metals Inc. in the next three weeks. This agency was set up to subsidize the gathering of scrap, where cost of laying metals down at steel mills is in excess of the ceiling prices.

Ford Boats Requisitioned

Two more vessels of the Ford Motor Co. fleet, the barges LAKE SAPOR and LAKE FRUGALITY, have been requisitioned by the War Shipping Administration, bringing to 12 the number of ships in the fleet turned over to government service. The barges were originally a part of the 100 freighters bought by Mr. Ford from the War Shipping Board after the first World war, their engines having been removed and 62 feet added to their length, to make keel length 313 feet. Neither saw service in the last war, not being completed until 1919.

Steel Industry's Scrap Stocks Shrink 40 Per Cent in Eighteen Months

STEEL mills' inventories of scrap iron and steel have shrunk approximately 40 per cent over the past 18 months of record-breaking steel production, and now represent an average for the entire steel industry of between two and three weeks' supply at the present rate of consumption, according to the American Iron and Steel Institute.

Compared with the total of 3,934,000 tons of scrap on hand at American steel plants on Jan. 1, 1941, the latest figures reveal that on July 1 of this year only 2,429,000 tons of scrap were in the mills' storage yards.

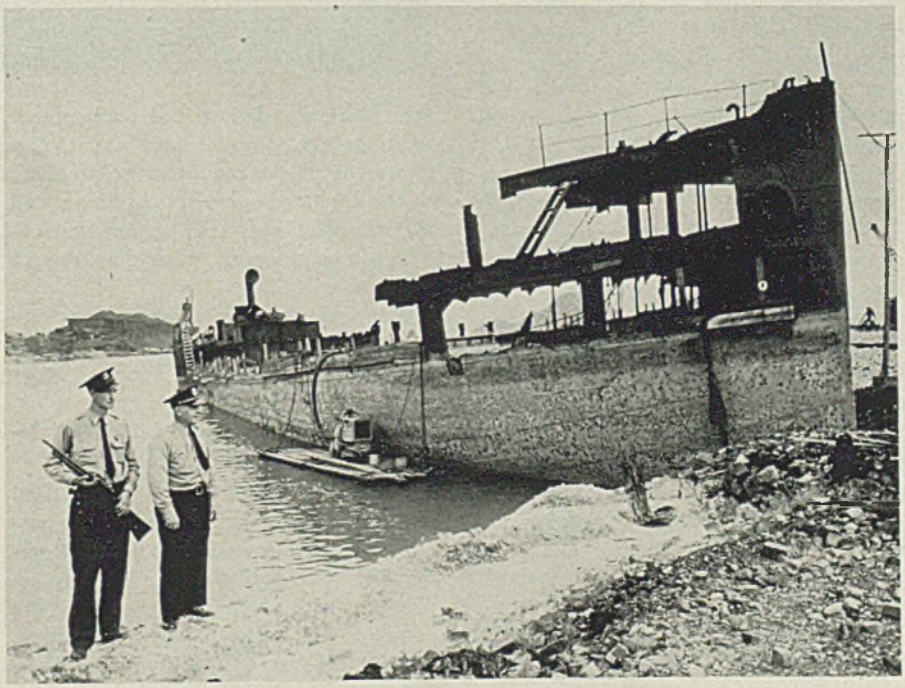
The tonnage on hand at the opening of 1941 was a satisfactory stock, representing over six weeks' supply at the average rate of consumption during 1940. The shrinkage since then has put the steel industry on a hand-to-mouth basis insofar as scrap is concerned, and has prevented steel production from reaching full capacity.

Despite their inability to obtain their full requirements of scrap for steelmaking, steel producers have nevertheless been able to produce more steel in the first half of 1942 than in any previous six-month period on record. This has been accomplished by using a greater than normal production of pig iron in steel furnaces, and also by charging large amounts of iron ore into steel furnaces.

Reflecting emergency practices designed to maintain steel production at peak volume despite the scrap shortage, producers of open-hearth steel now are consuming 580 tons of pig iron for every thousand tons of steel they produce, as against their 1941 average of using 557 tons of pig iron per thousand tons of open-hearth steel. Similarly, 46 tons of iron in the form of iron ore and mill scale are now being consumed in the open hearths per thousand tons of steel produced, compared with 42 tons in 1941.

On the other hand, the use of scrap per thousand tons of open-hearth steel produced has declined from 523 tons in 1941 to 507 tons this year. Producers of electric furnace steel have likewise made some changes in their practice. Since scrap is only a minor material in making bessemer steel, however, there has been no such drastic changes in bessemer practice.

Sunken Lake Vessels Raised for Old Metal



ONE-TIME oil tanker, the J. OSWALD BOYD, *which foundered in a storm on Lake Michigan six years ago, has been raised and is being salvaged for scrap. The Special Projects Salvage Section of the War Production Board is giving impetus to the raising of sunken lake vessels that can be salvaged. Wide World photo*

End Use Code To Be Simplified By Amendment

CLEVELAND

DETAILS of a proposed amendment of Priorities Regulation No. 10 which would set up a new Production Code to supplant the Allocation Classification System, were explained here last Tuesday by WPB officials before an audience of more than 1000 business men.

This was one of a series of meetings scheduled for each of the 13 regional centers of WPB.

The revision in PR-10 is expected to be announced officially shortly before the end of this month, with the new Production Code becoming effective Aug. 31, it was stated. Changeover from the Allocation Classification System now being employed is not seen likely to prove unduly confusing, since most of the basic principles in use of code letters and code numbers are retained in the new plan. However, several important changes are indicated.

To Simplify Classifications

In general, the proposed revision would result in simplification. For example, the five classes of purchasers for which Allocation Classification symbols now are used—USA, USN, IL, FP and DP—are to be condensed into three groups, Army, Navy and All other.

A change which is expected to help eliminate some of the recent confusion over correct symbol marking of orders for repair, maintenance and operating supplies is the introduction of an additional number in each of the major number classes, to be used exclusively in identifying such supplies.

Code numbers under the proposed plan generally follow the pattern of the Allocation Classification System, Classes 1.00 through 7.00 being reserved for military equipment and the remainder for industrial and civilian products. Some changes are made in the subdivisions of these classes, however, and two new classes are added. One of the latter covers maritime items and the other is for repair, maintenance and operating supplies for businesses which have no code number of their own and are to transmit customer's symbols in ordering materials.

A new code number also is introduced for steel warehouses and other distributors who resell metals in substantially the same form as it was received.

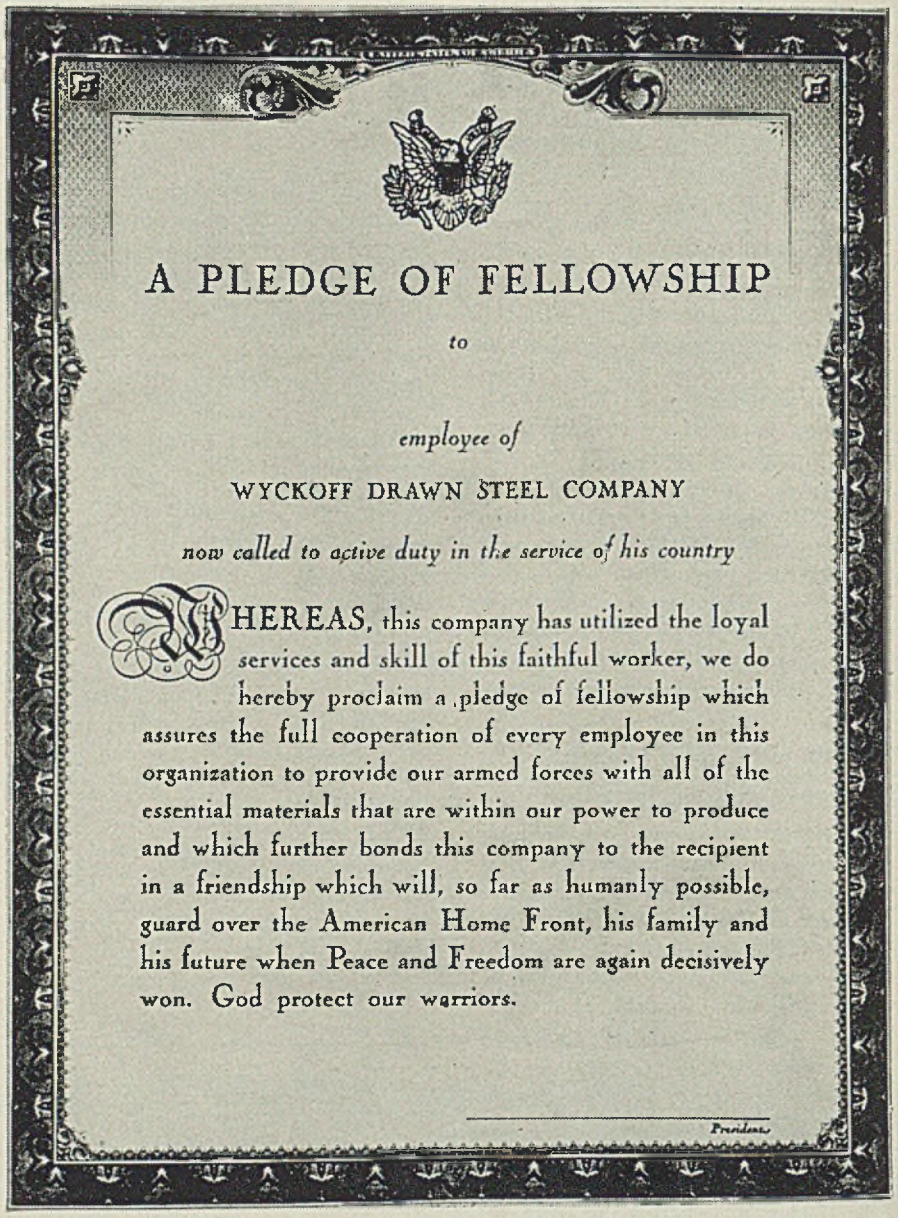
Purchases of raw materials prior to processing are exempt from the code.

Operation of the Production Requirements Plan was discussed at a subsequent meeting here. Applications on PD-25A for fourth quarter requirements are being received in large number, but it was stated that no additional third quarter applications can be processed unless they are sent in at once.

Many third quarter applications are continuing to come in from companies deciding voluntarily to operate under PRP, even though they are not required to do so under terms of Priorities Regulation No. 11.

Companies which do not submit third quarter applications immediately are now advised that they cannot be accepted under PRP until next quarter. The only exceptions to this rule are new companies or plants just ready to begin production.

Aug. 10 was the deadline for filing fourth quarter PRP applications by companies whose use of the plan is mandatory, and the time for accepting voluntary fourth quarter application will also be limited, it was explained.



A PLEDGE OF FELLOWSHIP

to

employee of

WYCKOFF DRAWN STEEL COMPANY

now called to active duty in the service of his country

WHEREAS, this company has utilized the loyal services and skill of this faithful worker, we do hereby proclaim a pledge of fellowship which assures the full cooperation of every employee in this organization to provide our armed forces with all of the essential materials that are within our power to produce and which further bonds this company to the recipient in a friendship which will, so far as humanly possible, guard over the American Home Front, his family and his future when Peace and Freedom are again decisively won. God protect our warriors.

President

Wyckoff Offers Soldiers "Pledge of Fellowship"

Wyckoff Drawn Steel Co., Pittsburgh, is honoring employes called to duty in the Army, Navy and other branches of the armed forces with "A Pledge of Fellowship," signed by J. T. Somers, president. The pledge assures full co-operation of employes to provide the armed forces with all the essential materials within their power to produce.

Further, it "bonds this company to the recipient in a friendship which will, so far as humanly possible, guard over the American Home Front, his family and his future when Peace and Freedom are again decisively won." The name of the man honored is placed in large letters on the certificate, which is stamped with the company seal, and then attractively framed and mailed to his family. A folder is being distributed to all Wyckoff employes, telling them about Wyckoff workers' part in the Victory program.

Activity Index Moves Slightly Upward

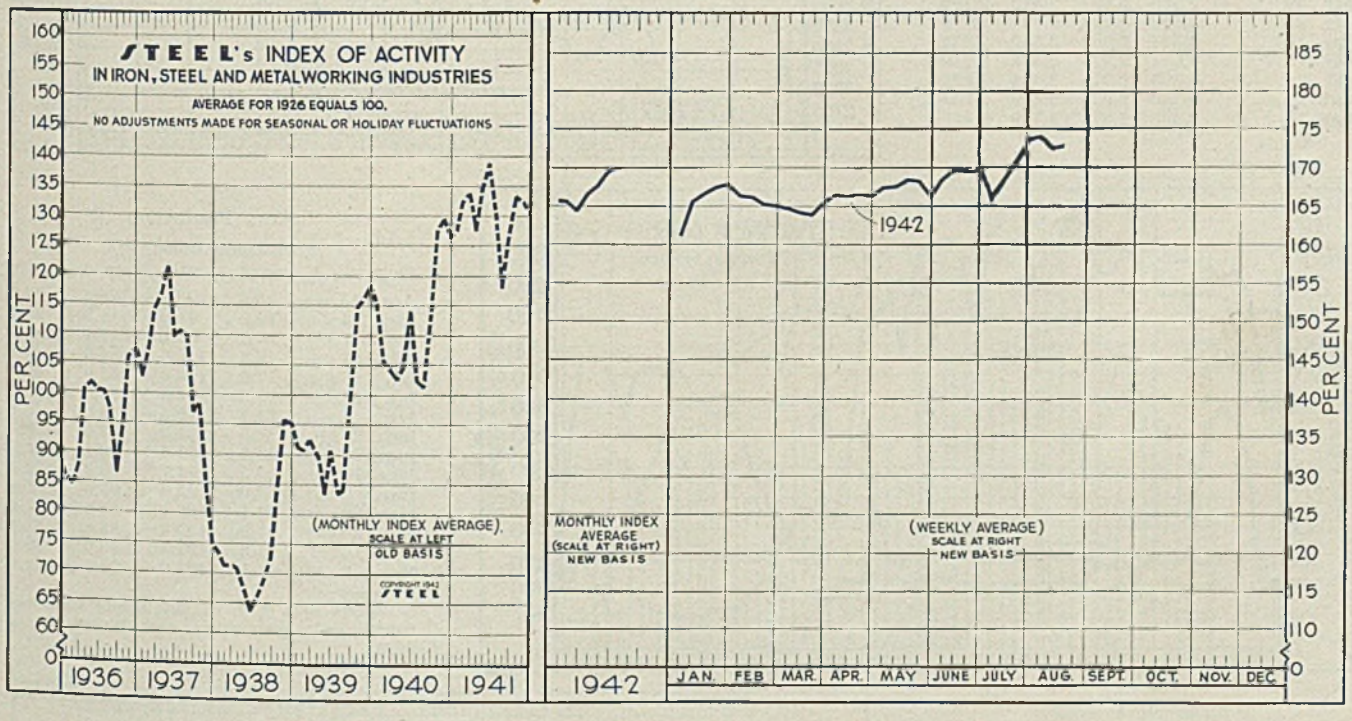
REFLECTING an upturn in electric power consumption and revenue freight carloadings, STEEL's index of activity turned slightly upward during the week ended Aug. 15. In that period the index stood at 172.9, compared with 172.8 in the preceding week and 172.1 in the like period a month ago.

The national steel rate eased one-half point to 97 per cent in the week of Aug. 15. The peak rate recorded this year was 99.5 in the period ended May 16. Steel ingot production has fluctuated between the narrow range of 96 and 99.5 per cent to date this year. Necessary open hearth furnace repairs and shortage of steel scrap have been the chief factors in preventing capacity steel output.

Electric power consumption climbed to a new all time peak of 3,654,795,000 kilowatts during the latest period. This compares with 3,637,070,000 kilowatts in the preceding week and represents an increase of 12.9 per cent over that recorded in the like 1941 period.

Revenue freight carloadings rose slightly to about 855,000 cars in the week ended Aug. 15. In the like period a year ago freight traffic totaled 890,374 cars.

In a few months new production facilities for steel, aluminum, magnesium and other needed materials are expected to be brought into operation. This should result in another marked upturn in production of armaments. In the meantime the chief problem is to bring the production program into better balance through more systematic distribution of the scarce materials.



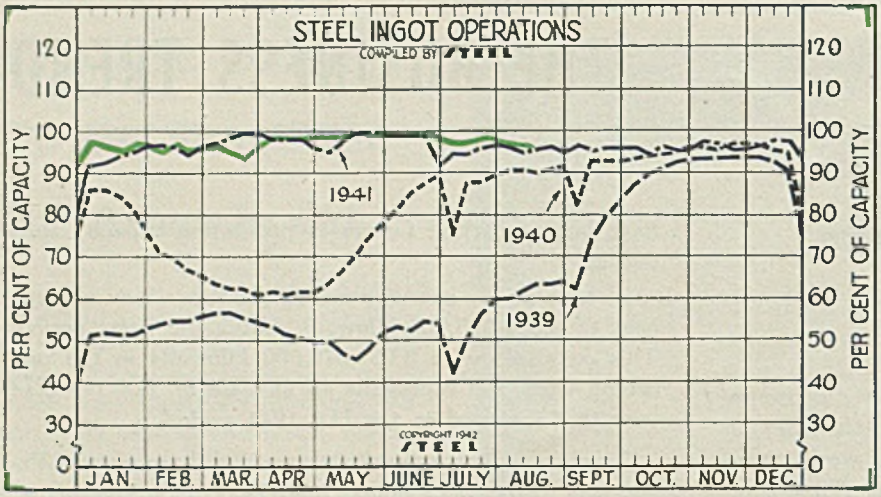
STEEL'S index of activity advanced 0.1 point to 172.9 in the week ending Aug. 15:

Week Ended	1942	1941
June 13	169.8	138.7
June 20	169.5	138.7
June 27	169.8	138.8
July 4	166.5	120.9
July 11	168.9	133.4
July 18	172.1	133.2
July 25	173.6	132.9
Aug. 1	173.8	123.3
Aug. 8	172.8	117.5
Aug. 15	172.9†	118.2

†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	102.3	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.	....	118.1	101.1	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4
Sept.	....	126.4	113.5	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3
Oct.	....	133.1	127.8	114.9	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2
Nov.	....	132.2	129.5	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4
Dec.	....	130.2	126.3	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3

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



Steel Ingot Operations

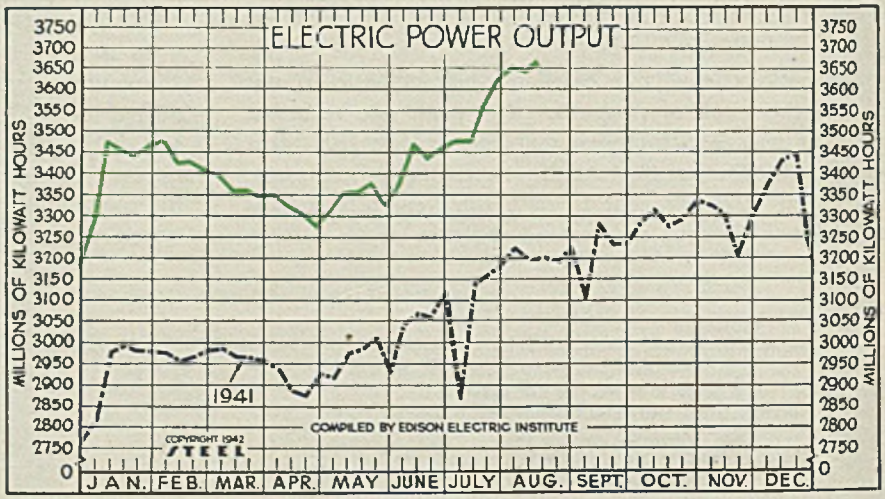
(Per Cent)

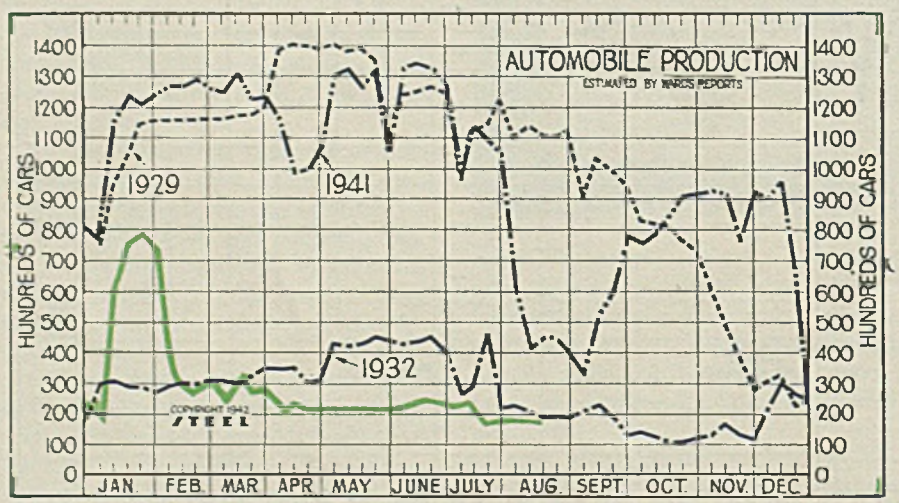
Week ended	1942	1941	1940	1939
Aug. 15	97.0	95.5	90.0	63.5
Aug. 8	97.5	96.5	90.5	62.0
Aug. 1	98.0	97.5	90.5	60.0
July 25	98.5	96.0	89.5	60.0
July 18	98.0	95.0	88.0	56.5
July 11	97.5	95.0	88.0	50.5
July 4	97.5	92.0	75.0	42.0
June 27	98.5	99.5	89.0	54.0
June 20	99.0	99.0	88.0	54.5
June 13	99.0	99.0	86.0	52.5
June 6	99.0	99.0	81.5	53.5
May 30	99.0	99.0	78.5	52.0
May 23	99.0	100.0	75.0	48.0
May 16	99.5	99.5	70.0	45.5
May 9	99.0	97.5	66.5	47.0
May 2	99.0	95.0	63.5	49.0
April 25	98.5	96.0	61.5	49.0
April 18	98.5	98.0	61.5	50.5

Electric Power Output

(Million KWH)

Week ended	1942	1941	1940	1939
Aug. 15	3,655	3,201	2,746	2,454
Aug. 8	3,649	3,196	2,743	2,414
Aug. 1	3,649	3,226	2,762	2,400
July 25	3,626	3,184	2,761	2,427
July 18	3,565	3,163	2,681	2,378
July 11	3,429	3,141	2,652	2,403
July 4	3,424	2,867	2,425	2,145
June 27	3,457	3,121	2,660	2,396
June 20	3,434	3,056	2,654	2,362
June 13	3,464	3,066	2,665	2,341
June 6	3,372	3,042	2,599	2,329
May 30	3,323	2,924	2,478	2,186
May 23	3,380	3,012	2,589	2,778
May 16	3,357	2,983	2,550	2,235
May 9	3,351	2,975	2,516	2,239
May 2	3,305	2,915	2,504	2,225
April 25	3,299	2,926	2,499	2,244
April 18	3,308	2,874	2,529	2,265





Auto Production

(1000 Units)

Week ended	1942	1941	1940	1939
Aug. 15	19.2	45.6	20.5	13.0
Aug. 8	19.2	41.8	12.6	24.9
Aug. 1	18.3	62.1	17.4	28.3
July 25	18.3	105.6	34.8	40.6
July 18	17.9	109.9	53.0	47.7
July 11	23.0	114.3	65.2	61.6
July 4	22.7	96.5	52.0	42.8
June 27	22.9	127.9	87.6	70.7
June 20	23.2	133.6	90.1	81.1
June 13	22.3	134.7	93.6	78.3
June 6	22.0	133.6	95.6	65.3
May 30	21.5	106.4	61.3	32.4
May 23	21.6	133.6	96.8	67.7
May 16	21.8	127.3	99.0	80.1
May 9	21.5	132.6	98.5	72.4

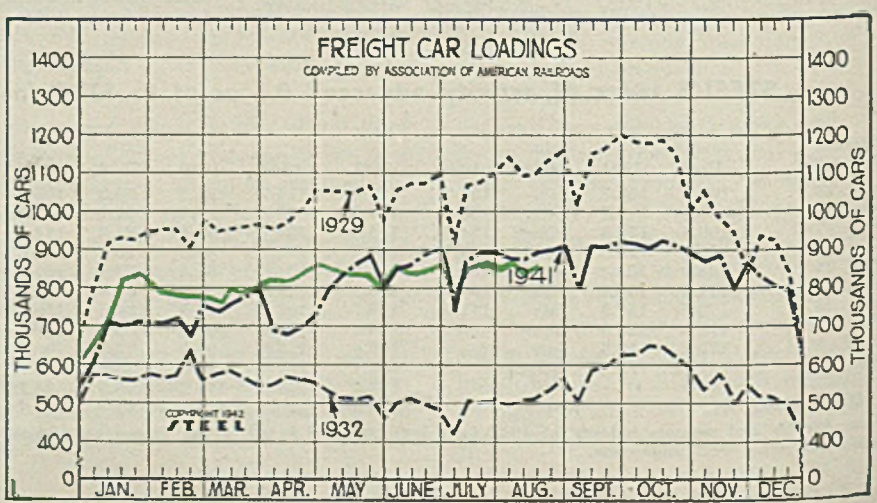
Figures since Feb. 21 last include Canadian trucks and automobiles and United States trucks.

Freight Car Loadings

(1000 Cars)

Week ended	1942	1941	1940	1939
Aug. 15	855†	890	743	674
Aug. 8	850	879	727	665
Aug. 1	864	883	718	661
July 25	856	897	718	660
July 18	857	899	730	656
July 11	855	876	740	674
July 4	759	741	637	559
June 27	853	909	752	660
June 20	840	886	728	643
June 13	833	863	712	638
June 6	855	853	703	635
May 30	796	802	639	568
May 23	838	866	687	628
May 16	839	861	679	616

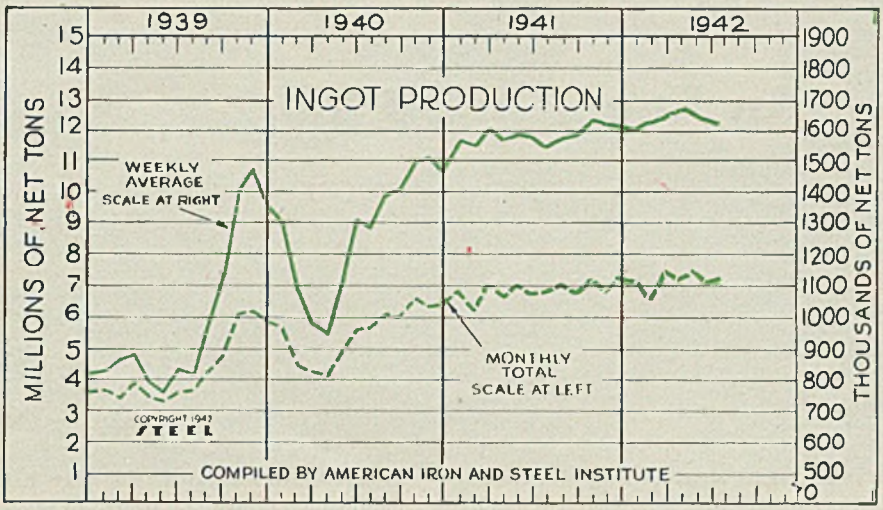
†Preliminary.

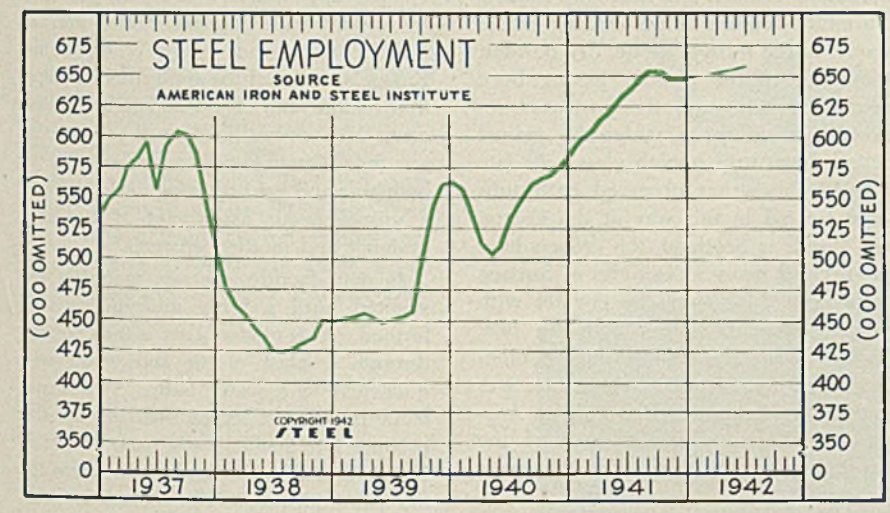


Steel Ingot Production

(Unit 100 Net Tons)

	Monthly Total		Weekly Average	
	1942	1941	1942	1941
Jan.	7,124.9	6 922.4	1.608.3	1.562.6
Feb.	6,521.1	6 230.4	1.630.3	1.557.6
Mar.	7,392.9	7.124.0	1.668.8	1.608.1
April	7,122.3	6.754.2	1.660.2	1.574.4
May	7,386.9	7,044.6	1,667.5	1,590.2
June	7,022.2	6,792.8	1,636.9	1,583.4
July	7,148.8	6,812.2	1,617.4	1,541.2
Aug.	.....	6,997.5	.....	1,579.6
Sept.	.....	6,811.8	.....	1,591.5
Oct.	.....	7,236.1	.....	1,633.4
Nov.	.....	6,960.9	.....	1,622.6
Dec.	.....	7,150.3	.....	1,617.7
Total	.....	82,836.9	.....	1,588.7





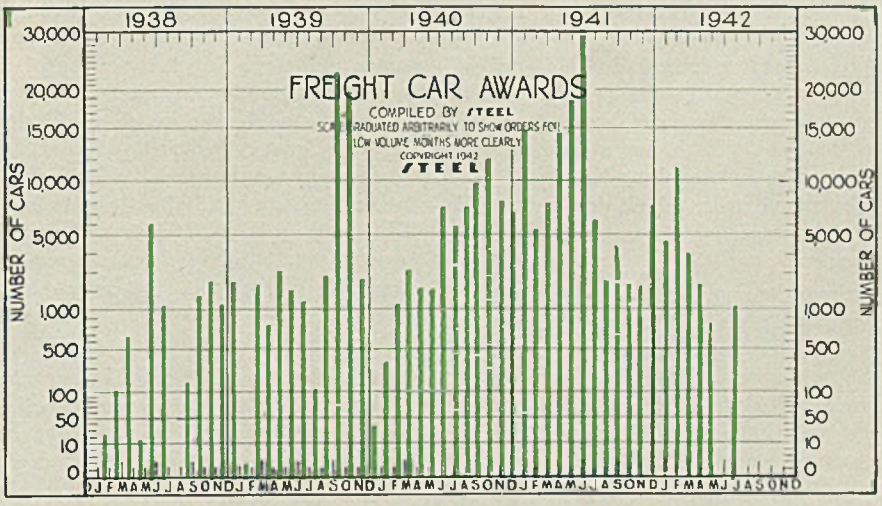
Steel Employment

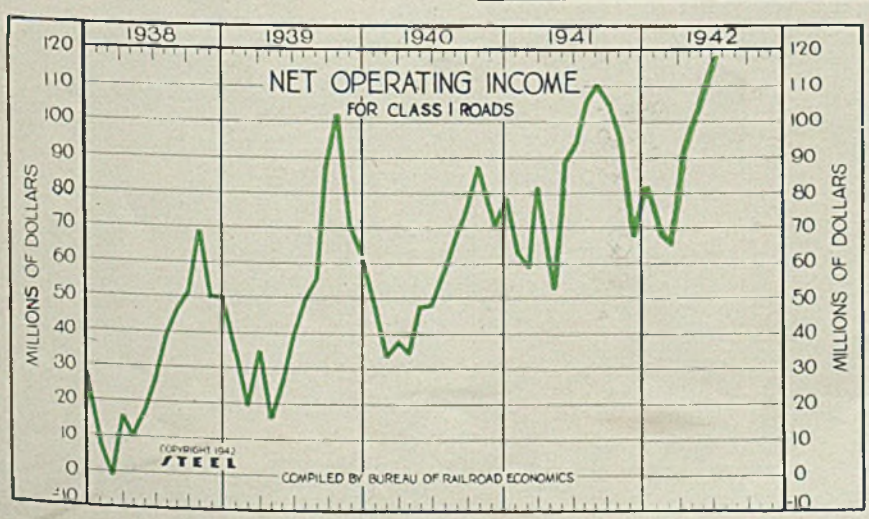
(000 omitted)

	1942	1941	1940	1939	1938
Jan.	651	598	556	451	475
Feb.	651	603	538	453	461
Mar.	653	613	514	455	455
Apr.	654	621	503	452	445
May	656	632	510	448	436
June	659	638	535	451	425
July	...	648	549	453	424
Aug.	...	654	560	458	427
Sept.	...	652	565	502	431
Oct.	...	646	568	545	436
Nov.	...	645	577	561	450
Dec.	...	646	585	563	449

Freight Car Awards

	1942	1941	1940	1939
Jan.	4,253	15,169	360	3
Feb.	11,725	5,508	1,147	2,259
March	4,080	8,074	3,104	800
April	2,125	14,645	2,077	3,095
May	822	18,630	2,010	2,051
June	0	32,749	7,475	1,324
July	1,025	6,459	5,846	110
7 mos.	24,030	101,224	22,019	9,642
Aug.	.....	2,668	7,525	2,814
Sept.	.....	4,470	9,735	23,000
Oct.	.....	2,499	12,195	19,634
Nov.	.....	2,222	8,234	2,650
Dec.	.....	8,406	7,181	35
Total	.....	121,499	66,889	57,775





Class I Railroads
Net Operating Income

(Unit: $1,000,000)

	1942	1941	1940	1939
Jan.	$68.97	$62.02	$46.01	$32.95
Feb.	66.49	58.48	32.86	18.64
Mar.	92.39	80.63	37.03	34.38
April	102.03	52.57	34.12	15.32
May	109.63	88.63	47.41	25.17
June	118.73	93.26	48.09	39.17
July	. .	106.31	57.73	49.00
Aug.	. .	111.32	66.53	54.57
Sept.	. .	104.07	74.72	86.53
Oct.	. .	93.66	87.64	101.72
Nov.	. .	68.76	72.00	70.41
Dec.	. .	80.55	78.79	60.95
Average	.....	$83.29	$56.84	$49.02

*Indicates deficit.

An Enameling Plant

CONVERTS

To War Production

ENAMELING is an ancient art. Long before the Christian era, men had learned to apply enamel to earthenware and brickwork and to use it in the fashioning of jewelry and trinkets.

Among the ruins of the valley of the Nile and Greece of olden time, ample evidences have been discovered of the ability of these long forgotten peoples of the Old World to decorate the walls of their homes and public buildings in this way and to adorn their womenfolk with enamel cloissone, in which the contours of the design were formed of thin strips of metal soldered to the base.

From the countries bordering the eastern end of the Mediterranean, the art spread westward to Rome and thence to the Isles of Britain, along with the Roman legions, where its evidences appear together with other vestiges of Roman occupation. Throughout the Middle Ages enameling flourished in all its glory, reliquaries, pyxes, church candlesticks and even the altar itself being decorated in this way. In this more prosaic, and perhaps sophisticated age in which we live, shop fronts, advertising signs and kitchen ware are its most familiar expression.

From the application of enamel to pottery and glass and thence in turn to gold, silver and copper, we arrive at the widespread industrial development of enameled iron ware concurrently with the rise of the steel industry. Early in the nineteenth century, cast iron parts first received attention, the part being thoroughly cleaned and heated to redness in a muffle furnace before dusting on the enamel in the form of a fine, dry powder. Adherence of the powder having been secured in this way, the part was returned to the furnace, where the enamel melted down to a smooth glass. As late as 1912 the writer observed bath tubs being treated in this way at the Carron Iron Works in Scotland, the process having survived many vicissitudes of furnace inefficiency, blackening by contact with furnace gases, blistering and the like. Finally, about the middle of the nineteenth century, enameled sheet iron was produced on a commercial scale in Austria and Germany, and the era of the vast industrial expansion of the process began.

While space forbids more than the briefest reference to the extended story of enamel technology, it may be of interest to note that an enamel may be defined as a glass to which the desired degree of opacity and shade of color have been imparted by metallic oxides and other elements, including certain salts. The principal constituents of granite, namely quartz and feldspar, constitute the body of the melt. These, when associated with a flux such as borax, soda ash, or others, result in a glass.

This glass would be more or less transparent but for the presence of opacifiers such as tin oxide, antimony, and so forth, which serve to scatter the light and give the enamel its characteristic white, opaque appearance. Color is provided by cobalt oxide, copper oxide, iron or nickel oxide, and many other stains. Enamels designed for application to sheet iron include the cobalt and light-colored coats laid down next to the metal to secure adherence; white cover coats in both soft and acid resisting varieties; and a miscellaneous assortment of beading, graining and mottled enamels.

In manufacture, the raw materials are smelted until a fairly uniform glass is formed. This molten glass is then poured through a blast of air and water and quenched in a water bath. This treatment has the effect of breaking up the product into small pieces, each of which is intersected with cracks which render the subsequent milling operations relatively easy. The "frit" which results from the quenching operation is commonly dried and delivered to the enameler in this condition.

The milling of the "batch" is carried out in ball mills which consist essentially of metal cylinders revolving about a horizontal axis and lined throughout with porcelain brick. As the mill revolves, the

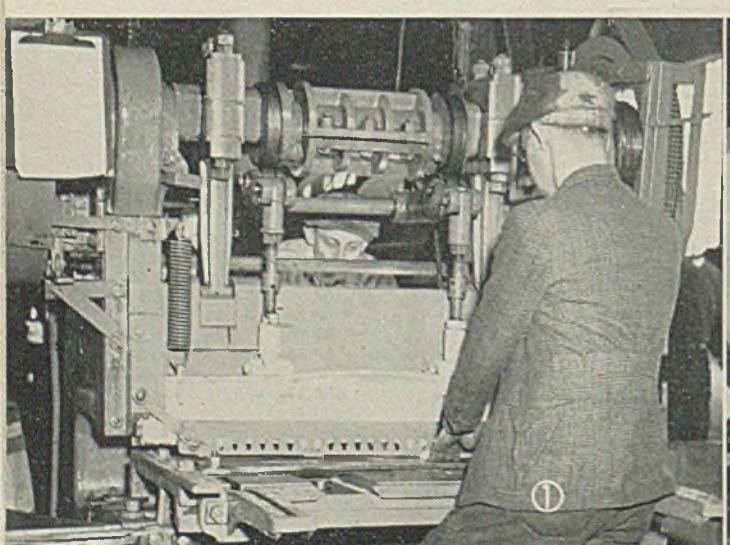


Fig. 1—Typical squaring shear, provided with the usual blank holder and safety guard

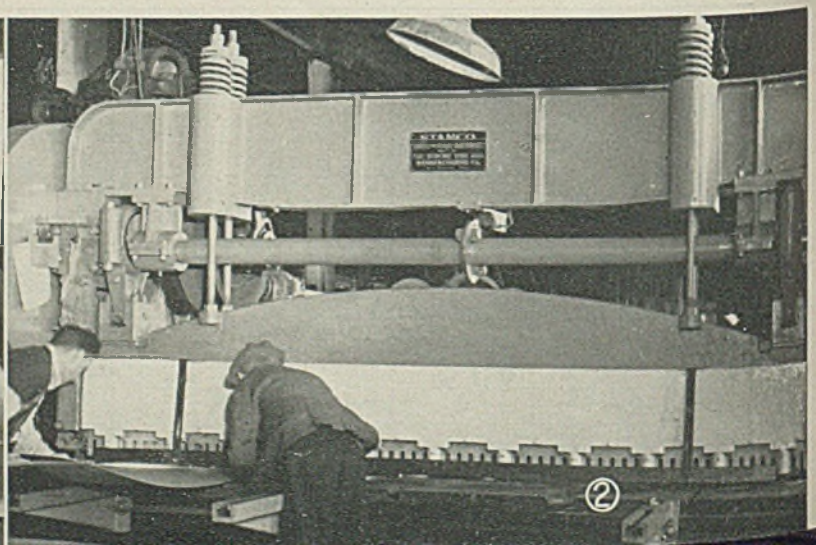


Fig. 2—This 10-foot shear was used for cutting out large signs. All illustrations courtesy Baltimore Enamel & Novelty Co.

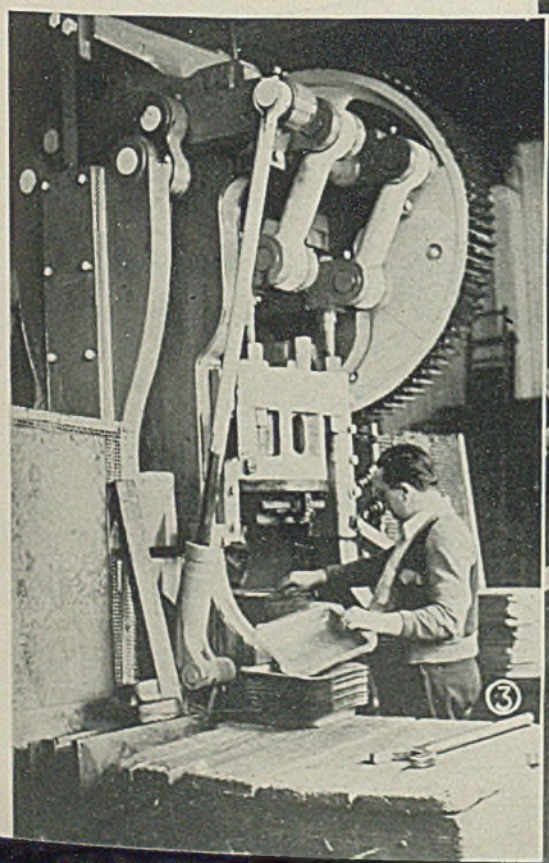
By ARTHUR F. MACCONOCHIE
Head, Department of Mechanical Engineering
University of Virginia
University Station, Va.
And
Contributing Editor, STEEL

balls which may be made of hard white porcelain or consist of natural flint pebbles from the northwestern coasts of Europe, are carried up inside the cylinder and cascade downward as they approach the highest point of the path. It is here in the mill that the floating agents such as clay and gums, opacifiers and colors are mixed with the frit and water in the wet process together with soluble compounds such as borax, magnesium sulphate, sodium carbonate, etc., whose electrolytic action controls the properties of the "slip". It will be apparent that without benefit of the floating agents, a finely ground enamel containing about 30 per cent of water, would quickly sink to the bottom of the enamel-

(*Please turn to Page 74*)

Fig. 5—Spraying paint on an ammunition box. Enamel sprays available in a porcelain enameling plant can readily be applied to spraying a wide variety of paints and lacquers

Fig. 6—One of the jobs for which the sheet metal department was suited was found to be the manufacture of ammunition boxes shown here. These are being built for the merchant marine



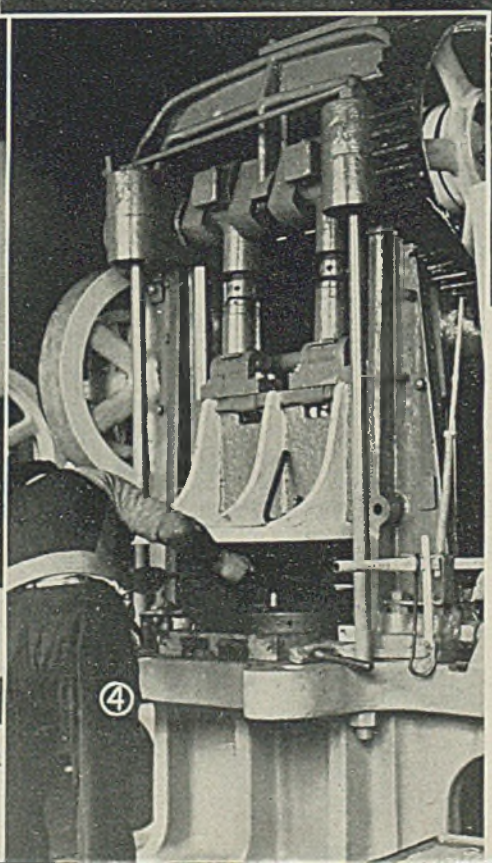


Fig. 3 — Double-action Bliss drawing press with a stroke of 12 inches, making it capable of handling a 6-inch draw

Fig. 4 — Short-stroke blanking and trimming press—typical of equipment found in those porcelain enameling plants that handle their own sheet metal fabrication work

Production

. . . . a valuable production shortcut for every metal-

WAR PRODUCTION industries, hampered by the acute scarcity of skilled workers for their high-speed production and assembly lines, now can take advantage of a practical method which already has been found to alleviate the labor problem.

What is it? A system of "production illustrations" developed by Douglas Aircraft Co., and already adopted at a number of other large war plants as an aid in the training and absorption of new employes.

Banish any thought that "production illustrations" is some new combination of words contrived by a "bright boy" in a red-tape office who never saw a production line. It wasn't. George Tharratt, now chief engineer of the Adel Precision Products Corp., Burbank, Calif., played a leading role in development of the method at Douglas Aircraft Co.

It has been successfully used there for more than two years in hundreds of ways, on many assembly lines, and by both skilled and unskilled workers. Results have been consistently good, and the system has been adopted elsewhere by men who know what they are doing. Included in the list of those now using "production illustrations" in addition to Douglas, or who soon will be, are Ford Motor Co., Pullman-Standard Car Mfg. Co., Briggs Body Co., Murray Corp. of America, as well as Boeing Consolidated and Lockheed-Vega aircraft companies.

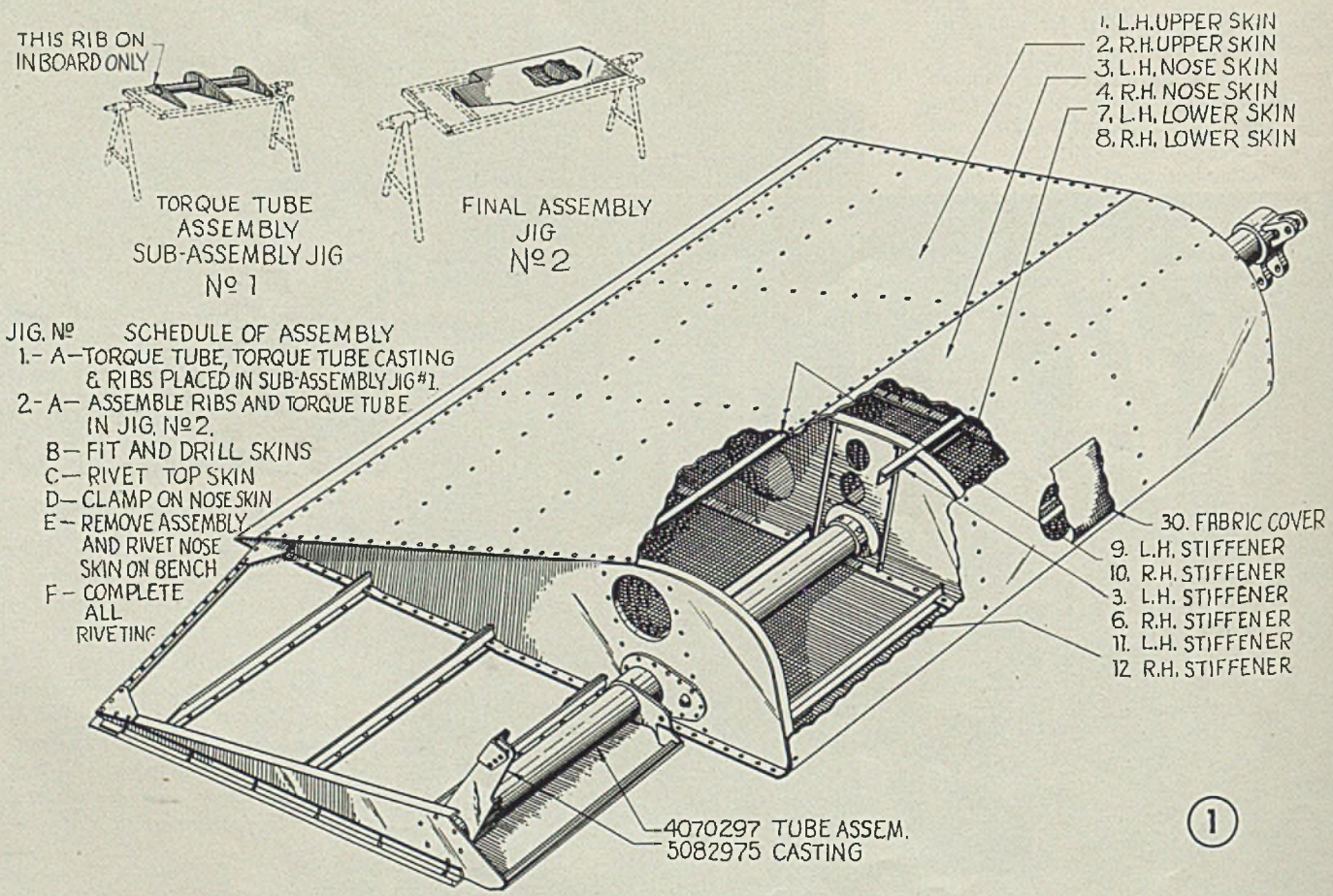
"Production illustrations 'bust the bottleneck' of blueprint reading requirements for our assembly lines", says C. T. Reid, director of education for the Douglas Aircraft Co. And, what is just as easy to take, they reduce assembly time, slash costs and will have widespread peacetime use. They are not just a war-production technique.

The method is easy and quick to install, does not require revamping of established departments, fits neatly between engineering and production departments, interpreting them one to the other. It is best set up as a subdivision of the engineering department.

This almost unbelievably useful new method is a gift to industry by Douglas and Mr. Tharratt. Means of adopting it will be provided by the United States government.

Arthur E. Raymond, vice president in charge of engineering for Douglas, terms production illustrations as ". . . . unique, cutaway, three-dimensional drawings which portray, in simple fashion, the manufacturing details and greatly speed the planning and operation of assembly lines for mass production."

In their early stages, production illustrations were more correctly "sales illustrations", being cutaway drawings, some in actual or proposed colors, of Douglas planes, made for the purpose of visualizing proposals to prospective buyers. Then the "European War" came to Douglas through extensive orders from England and France. Mass production of Douglas military planes for the first



Illustrations

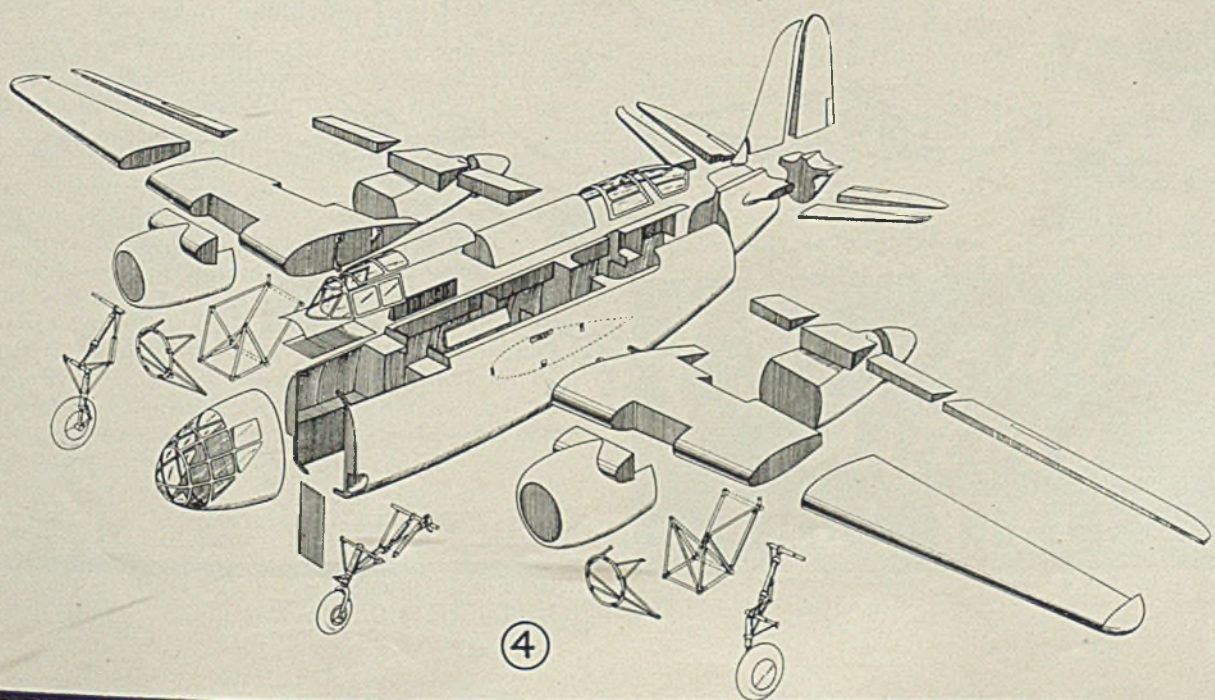
working plant

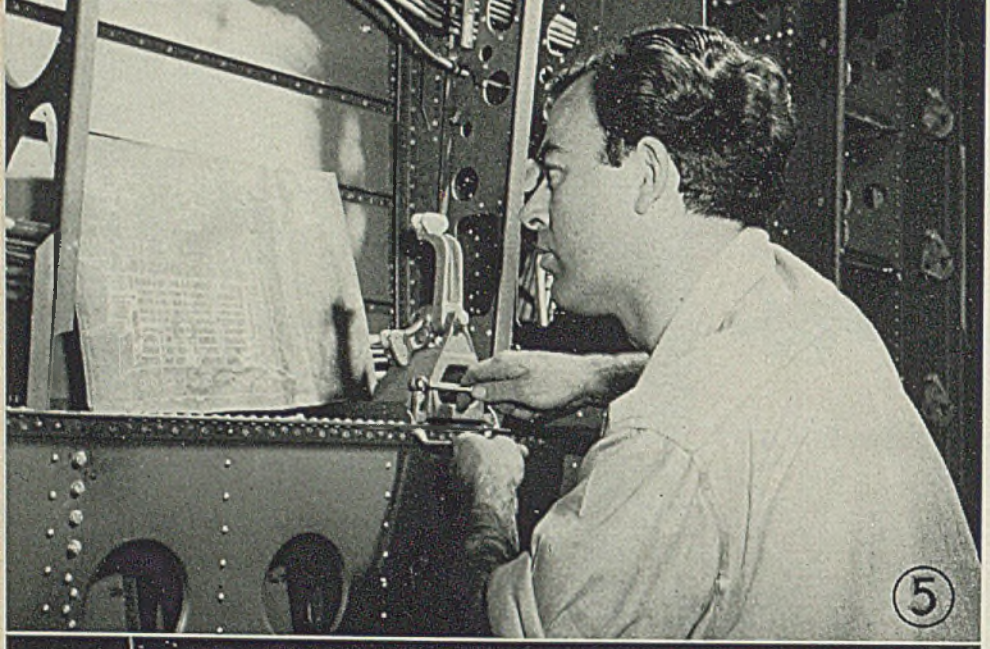
Fig. 1—Typical unit breakdown of inboard wing flap for Douglas attack bomber. Sheet also carries sketches of jigs and complete schedule of assembly operations as well as identification of all parts

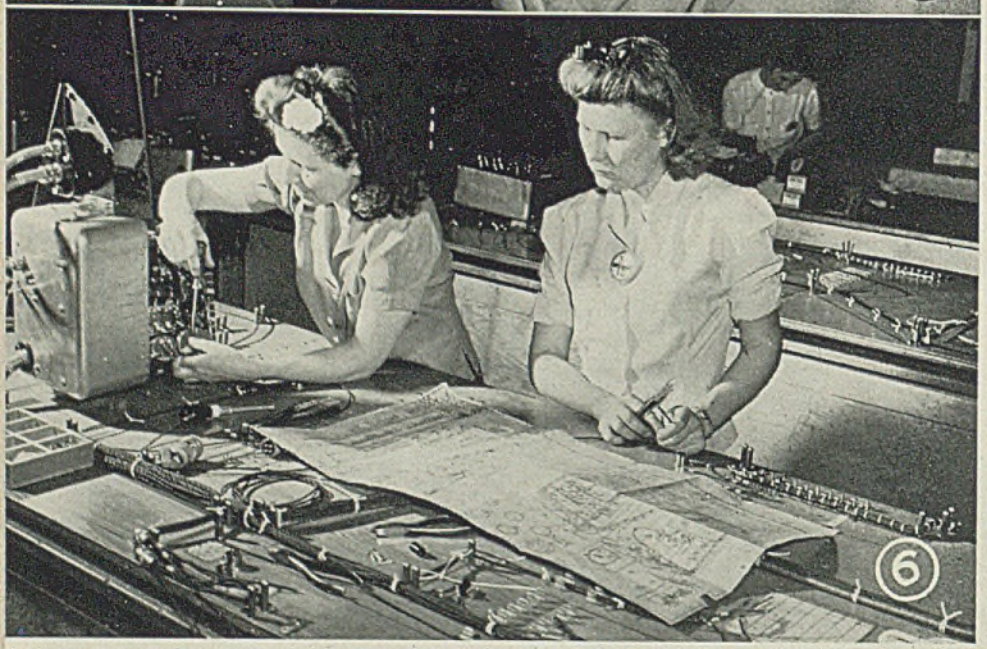
Fig. 2—Engineering blueprints of the conventional type sometimes were as much as 40 and 50 feet long. As shown, these had to be spread on the floor along the assembly line and there studied by men trained to read and interpret them properly. In general, simplified and easy-to-understand production illustrations are now used entirely in shop departments, with conventional blueprints used only by supervisors and engineers

Fig. 3—At left is N. V. Karstens, production illustrations engineer in charge of the group of artist-engineers who make the unique production illustrations at the Douglas Santa Monica plant. At right is his assistant, John Noble

Fig. 4—Typical production breakdown of Douglas attack bomber. Note arrangement of parts is same as that of assembled plane with all parts in positions close to final placement. Assembly is easily visualized by untrained worker







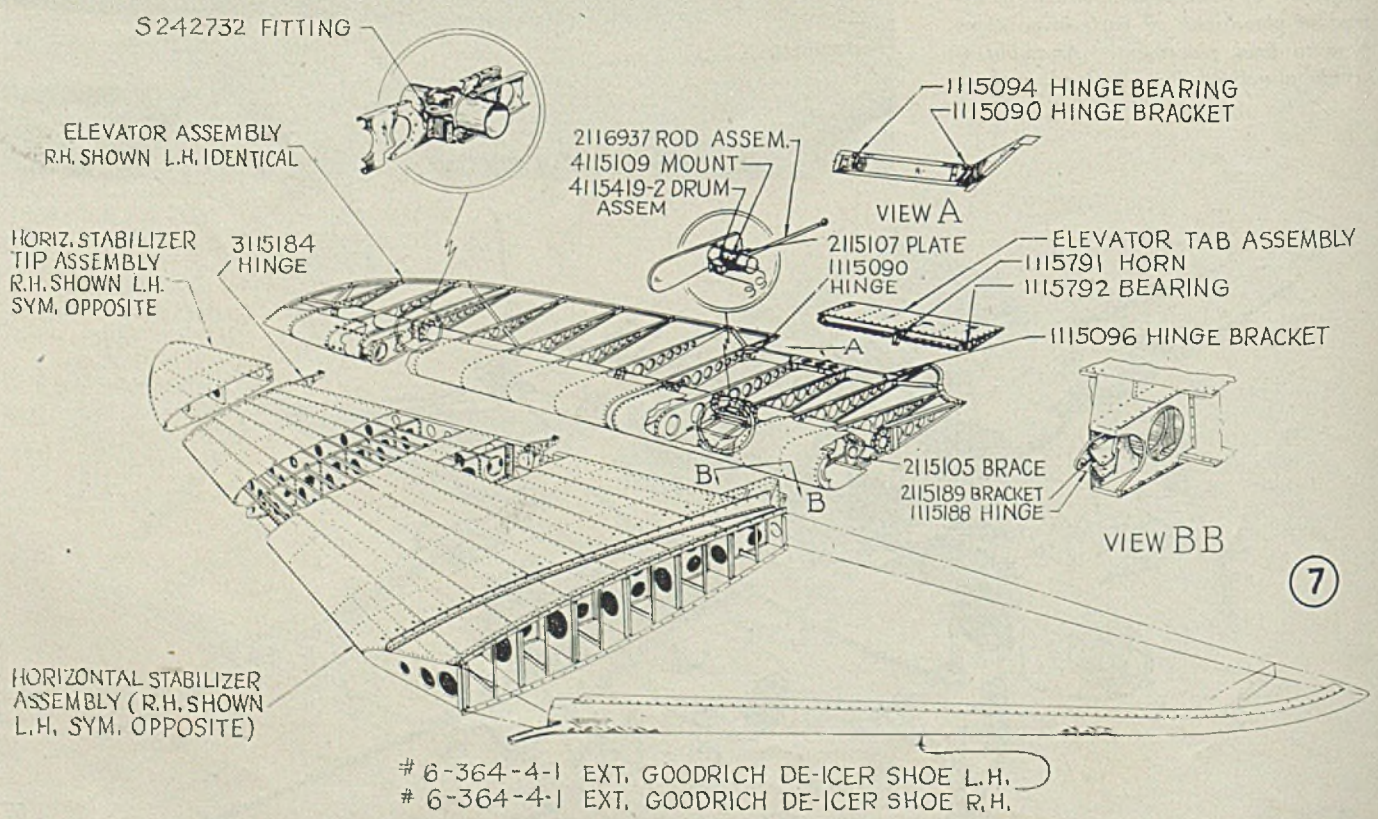
time became a possibility. Into the breech went Engineer Tharratt and his small group of artist-engineers, drawing production-line proposals in easy-to-understand sketches. Ideas for special equipment, new tools and new methods of manufacture were passed from department to department in picture rather than wordy-description form.

It was found that a proposal needing approval could be explained to a production illustrations man verbally and sketched and re-sketched by him until it accurately conveyed the originator's ideas and would permit the proper au-

Fig. 5—Ruel Short, fuselage assembly line worker, shown using a production illustration on the job. With Douglas only a few months, Short previously served as a salesman for a wholesale grocery concern. He had a natural background of mechanical aptitude but no actual aviation work. His comment on production illustrations—"I don't know how I could have gotten along without them"

Fig. 6—At left is Margaret Walker, a former electric motor worker; at right, Virginia Rhodes, a former salesgirl in a store, now working with Miss Walker. Neither had any experience in the type of work they are now doing. They are shown using production illustrations during one of their first days at Douglas. Both said production illustrations were a great help in learning their new jobs

Fig. 7—Production illustration of horizontal stabilizer, elevator and tab for a Douglas military airplane



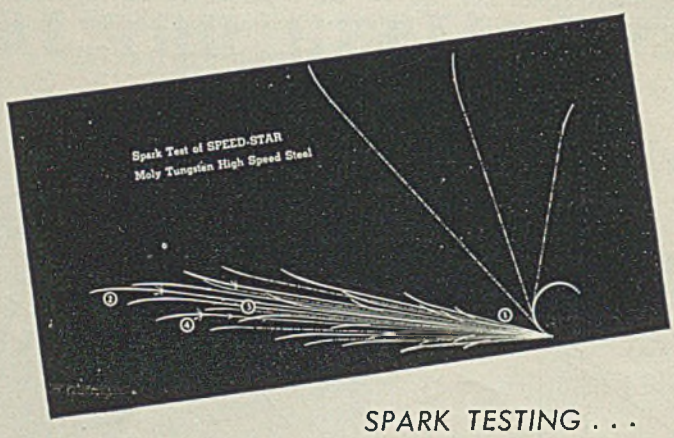
What About Your Tool Steel Scrap?

Get in the Scrap
FOR VICTORY

Before you say you haven't any around your plant . . . think a moment! In almost any plant, over a period of years, things accumulate.

For example, obsolete dies, tools, jigs and fixtures made of carbon and alloy tool steels get put aside in some storage corner. Broken or worn-out tools can be found in odd places throughout the tool room, machine shop and the plant in general.

Now the time has come to houseclean every corner, every storage bin, every possible hiding place to dig out such obsolete, discarded, broken or worn-out tools.



SPARK TESTING . . .
An aid to identifying Tool Steel Scrap

By holding the unknown piece of tool steel against an emery wheel, and watching the pattern of the spark stream, you get a quick indication of the major alloys present. To help your men become familiar with Spark Testing, a new Chart has been prepared by our own testing department. Ten different spark diagrams are shown on the Chart. These diagrams indicate the spark characteristics that identify each Carpenter Matched Tool Steel. With the Chart as a guide, men can readily become familiar with this method of steel identification. Not only is it helpful in separating mixed scrap, but Spark Testing is also valuable in identifying pieces of tool steel that have become mixed in stock. A note on your company letterhead will bring you one of these Carpenter Spark Testing Guides, made up in the form of a large Wall Chart 21" x 30" in size—showing the identifying *pattern* of the spark streams.

★ ★ ★ ★ ★ ★

Start them on their way back to usefulness via the scrap route. They are urgently needed to make up the scrap shortage that is curtailing America's war production.

You can render your country a service by organizing a scrap salvage drive in your plant at once. Explore all the departments—collect every bit of metal you can find—don't overlook those old tools—the alloys they contain are vital to war production.

For help in identifying tool steel scrap for salvage, see the Spark Testing Method described below.

Spark Test of SPEED-STAR
Moly Tungsten High-Speed Steel

The spark stream is full, having many heavy carrier lines (1)—light in color, and varying in length and thickness. The thicker ones are continuous, while the thinner ones are disjointed.

- *The thicker lines gradually swell into bright orange tongues (2) having a slight curvature, some upward and some downward. There is a tendency for some ghost-like lines to be carried around the periphery of the grinding wheel. Some few sprigs (3) and an occasional suppressed burst (4) are visible.*

SPARK CHARACTERISTICS OF VARIOUS ELEMENTS are clearly described on this chart. And complete instructions are given for *Spark Testing* tool steels.

THE CARPENTER STEEL COMPANY
139 Bern Street, Reading, Penna.

Carpenter MATCHED TOOL STEELS

thority to pass upon its merits quickly and intelligently. If found to be sound, the idea, in sketch form, was ready for the engineers, who then could plan it in detail for actual construction.

Engineers, likewise, found production illustrations a handy means of interpreting their work to superintendents, lead men and workmen on the assembly lines. Under normal conditions, perhaps, this would not have been necessary. But, converting an airplane plant from "job shop" methods to a new mass-production system posed hundreds of problems never before encountered. And not the least of them was where to get assembly line workers and train them to do jobs that had never before been done in the way this new system would require—all the while racing with delivery deadlines made doubly important by the terrible urgency of the English and French war machines' desperate needs.

Starting with four artistically-inclined engineers, George Tharratt gradually built a production illustrations staff that included "dozens of specially trained engineer-artists", the exact number a military secret now. So successful was their new product, "easily understood drawings", it was decided to acquaint other plants faced with similar problems with it and assist them, where requested, to adopt and adapt it to their needs. Among the first to avail themselves of the offer was the Boeing Aircraft Co.

During their visit to the Douglas plants in California, Edsel Ford, president and C. E. Sorenson, production manager, respectively, of the Ford Motor Co., inspected production illustration developments and declared they would inaugurate the method in that company's now rapidly-developing aviation division.

Others in the aircraft industry now using production illustrations are Consolidated Aircraft Corp. and the Vega division of the Lockheed Aircraft Corp. Recently J. E. Shea, methods engineer of the Vega plants, explained his company's use of the method as follows:

"In many cases, the major problems of engineering are minor problems in the shop, and, conversely, the major problems of the shop are not adequately covered in design drawings by the engineers. To bridge this difference and facilitate visualization of assemblies, illustrative sketches were introduced at the time our 'Ventura' model was released from engineering to the shop.

"The first sketches were drawn free hand in isometric style, run off on the ditto machine and distributed to the shop. Tests were then made to determine the value to assemblers on the floor. Two crews, one with an illustrated sketch and one without, were assigned to assemble the left and right-hand wing spar respectively. Crew 1, working with sketch, completed the first unit in 1.9 hours. Crew 2, working without sketch, completed the first unit in 5.4 hours.

"The inspection department used about the same proportion of time. This time differential, on a structural item, is greatly magnified on functional installations such as electrical and plumbing.

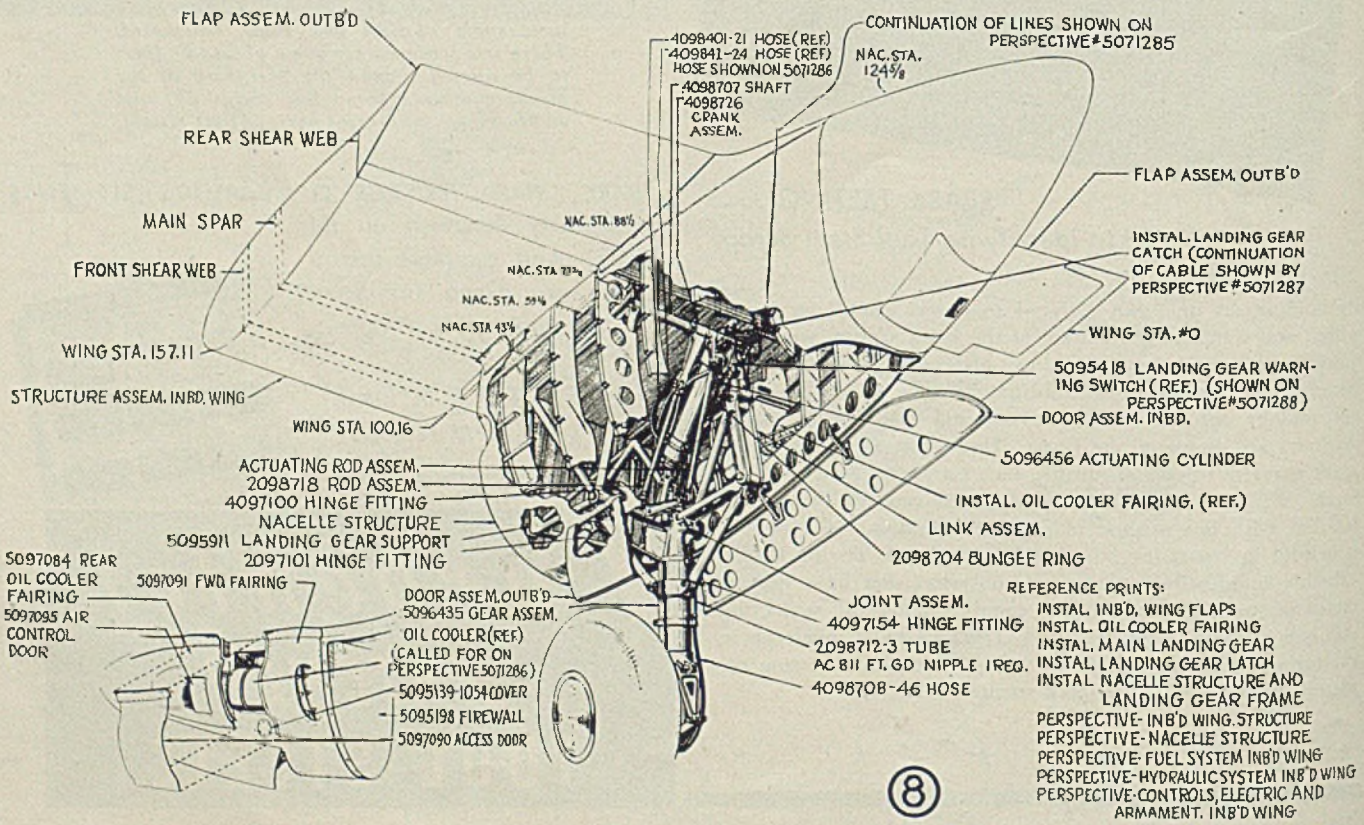
"To search through dozens of engineering electrical prints to find installation data for parts that must be installed in the subassembly departments is a slow and laborious task. It is a task that requires a man well trained in blueprint reading. Then in order to transmit the knowledge he has gained to a new man or learner he must be able to create the visualization in the mind of the learner, by either a word picture or sketch. We have found that an expert on blueprints may be lacking in the ability to describe to someone else a picture he has in his mind. In which case, our difficulties in lack of trained men are increased by restrictions in the field of supervision."

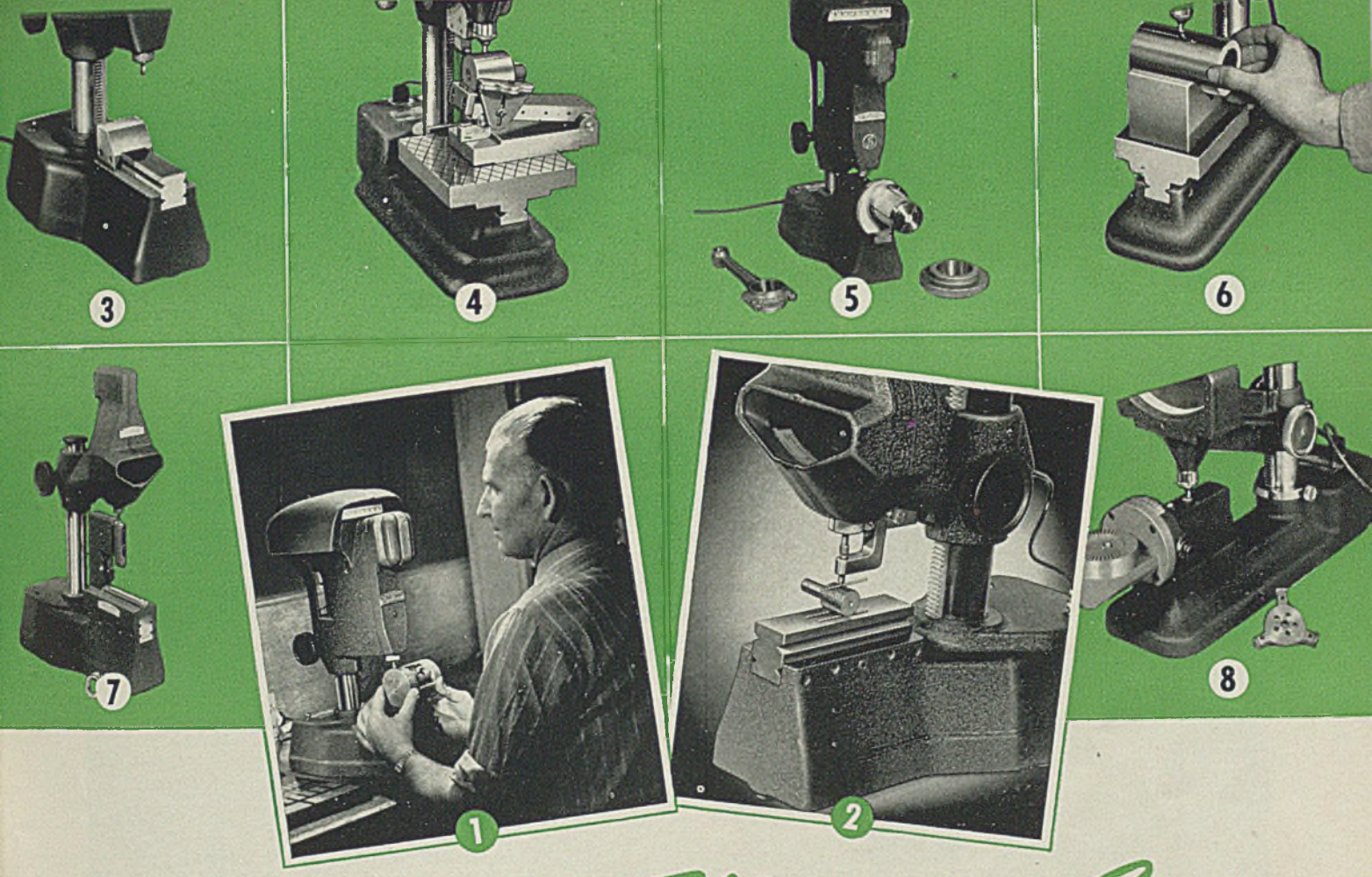
Production illustrations are of great value in co-ordinating inspection and production on the proper method of assembly or installation.

Another important use is ready visualization of tooling and handling equip-

(*Please turn to Page* 79)

Fig. 8—Engine nacelle and landing gear shown in the form of a production illustration





ARE YOU GETTING *Maximum Service* FROM YOUR VISUAL GAGES?

1 Equipped with plain and serrated anvil for the checking of width, thickness, height, or outside diameter.

2 Equipped with flat anvil and thread wire attachment for checking pitch diameter of screw threads.

3 Equipped with standard backstop for accurate and rapid positioning of work being gaged.

4 Equipped with wide anvil and Sheffield sine bar fixture for the checking of tapers.

5 Equipped with Sheffield Internalgage for the checking of inside diameter, taper, and out-of-round.

6 Equipped with wide anvil and V-block for checking outside diameter of cylinders and bushings.

7 Equipped with fixture to check ball diameter of an inner ball race.

8 Internalgage with fixture to check a depth.

The Sheffield Visual Gage is used for many purposes. If you are not familiar with all of them, the outline here may suggest a means of increasing the effectiveness of your gages and the variety of work they do.

Sheffield Visual Gages are used:

In the Inspection Department

For the final inspection of close tolerance manufactured parts.

For the classification of such parts as the basis for selective assembly.

In the Tool Room

To check fixed size gages for wear.

To check precision gage blocks for wear.

To check the dimensional accuracy of tools.

In the Production Shop

To provide machine operators with an accurate check on work in process.

In the Receiving Department

To check dimensional accuracy of purchased parts and sub-assemblies on arrival.

In the Laboratory

To provide maximum accuracy for measurements of all kinds.

THE SHEFFIELD CORPORATION

SHEFFIELD GAGES

DAYTON, OHIO, U. S. A.

REFRIGERATED TIPS

...increase welder output 3 to 10 times

...cut tip dressing time 75 to 90 per cent

...end point pickup, giving better welds

...cut mushrooming, improving uniformity

...enable thermocouple in tip to automatically control sequence of current applications to refine grain and temper spot weld, thus greatly improving quality of weld and bringing many hitherto critical steels into the realm of weldability

By HAROLD LAWRENCE
Metallurgist and Welding Engineer

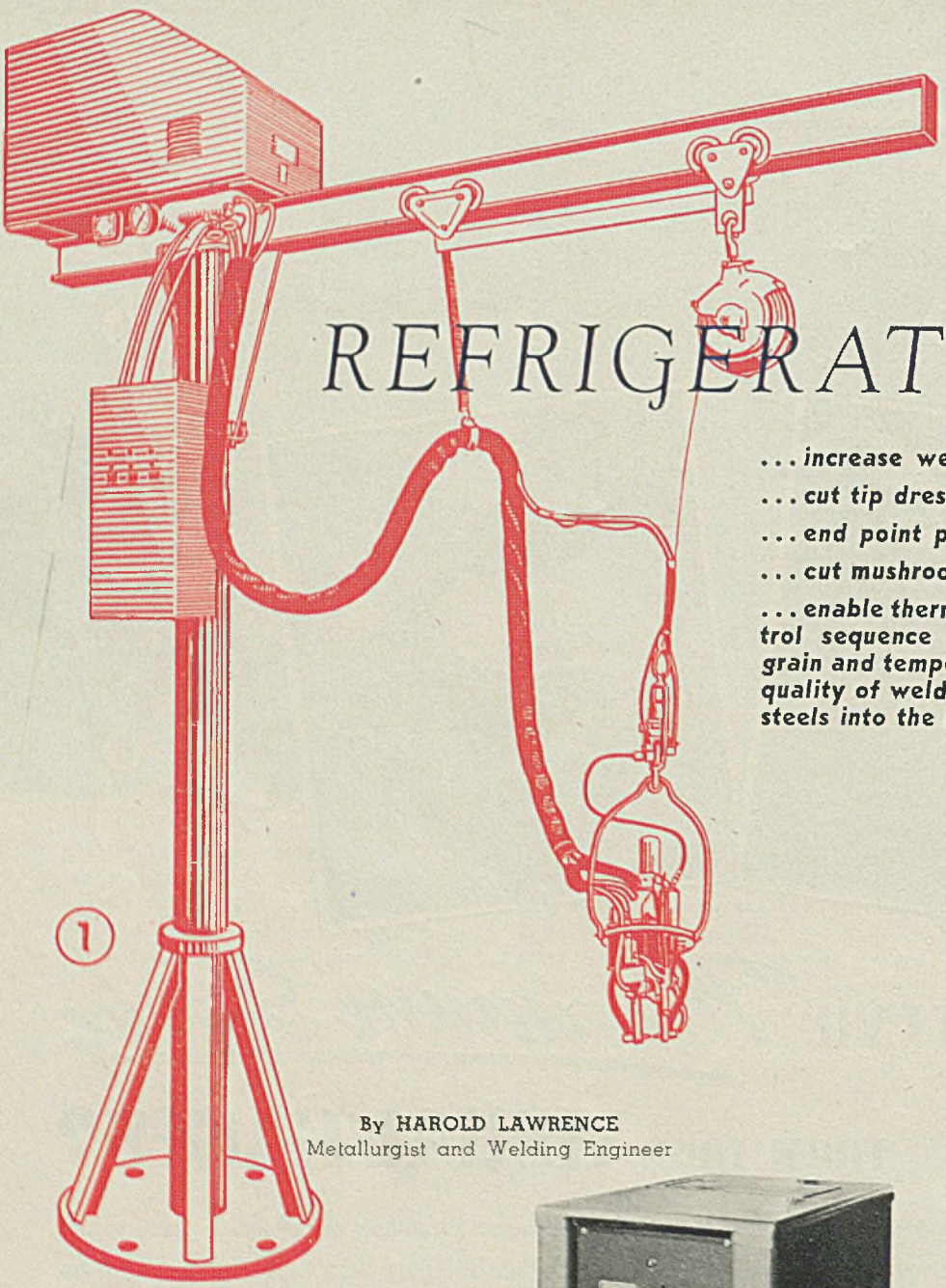


Fig. 1—Portable as well as stationary welders can be fitted with a refrigeration unit

Fig. 2—The Frostrode cooling unit is small and compact

THE BATTLE of production calls for the most efficient use of both machines and manpower to keep the streams of armament flowing to all the battle sectors of the United Nations.

With the demand for spot welding at an all-time peak, this means squeezing the greatest possible number of spot welds out of each piece of equipment to allow the machines available to increase this output.

With the "Frostrode" welding process, distributed through the Frostrode Division of the Weltronic Corp., Detroit, the goal of expanded output per machine is being reached. As will be pointed out, refrigerated tips are also making possible a revolutionary advance in the field of spot welding through the development of the "Temp-A-Trol" forge welder, which uses temperature control to weld, heat treat and temper the spot.

Increased production is served because the Frostrode process enables the user to get more production with less equipment; because from three to ten times more welds may be made without point dressing; because the down time on a production run is reduced by as much as 75 to 90 per cent; because point pick-up is almost completely eliminated; and because tip mushrooming is minimized.

Spot welding is no different from the other welding processes in that the

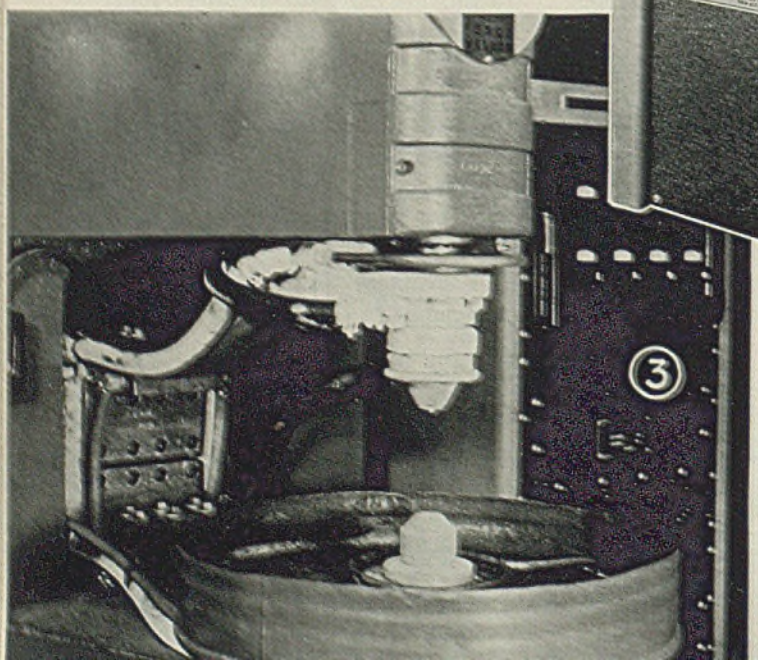


Fig. 3—This Temp-A-Trol forge welder employs refrigeration to make possible the incorporation of a thermocouple on one of the electrodes. This permits the operation to be controlled by weld temperature rather than controlled current and time which does not allow for many variables. This is the type of machine which with the control shown can apply a grain refinement treatment as well as a tempering treatment to the spot weld

"Yes, our streets are paved with gold"

"You needn't worry, son, about what will happen here after we've won the war. I can see more happiness ahead than we have ever known.

"I came here from the Old Country half hoping to find gold in the streets. And true enough, I found it, but in a way I didn't expect.

"It's in the happiness we have because we are Americans. There's this pretty home, with its garden and shady trees. The automobile we all enjoyed. Your mother's electric refrigerator, washing machine and vacuum cleaner, that save her strength and give her more time to have fun with us. The radio, that no one keeps us from listening to whenever we feel like it.

"This is the gold I see in the streets of America. I see freedom, which is the finest of all gold. For freedom gives us what money cannot buy—the chance to get the happiness we want by working for it.

"Our enemies in Europe and Asia will never succeed in taking all this away from us. We are free and they are not. Free men always fight better. So we will win. Then you will learn for yourself, son, that our streets are paved with gold."

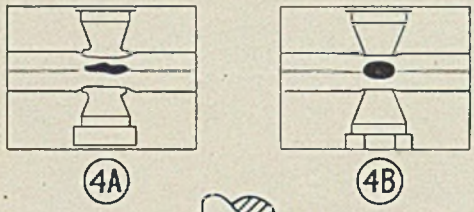
Revere Copper and Brass Incorporated was born at the time when America's system of free individual enterprise was first threatened from abroad. Paul Revere established this business to help our infant Navy prepare for the War of 1812 that lay ahead.

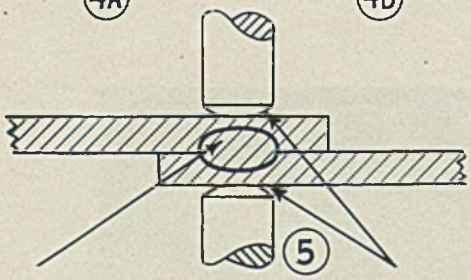
For 141 years, Revere has continued to serve the same principles of freedom by helping tens of thousands of American working men to find security and happiness, to serve themselves not only by producing, but by enjoying the fruits of their work.

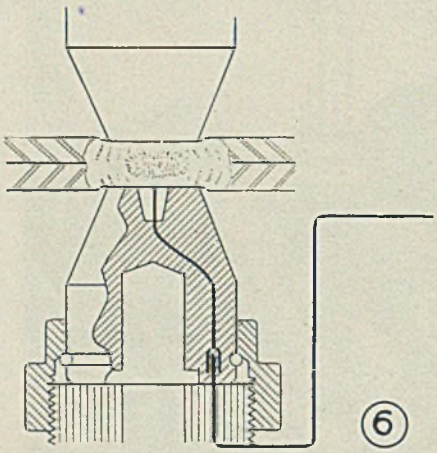
Under this system, free men will win the war. Under it they can likewise win the peace. When that time comes, Revere expects to bring more thousands of our people the opportunity to rebuild their standard of living to levels still higher than before. For we believe that in this way alone can we keep faith with those who have fought.

REVERE COPPER AND BRASS INCORPORATED

★ *Founded by Paul Revere in 1801* ★







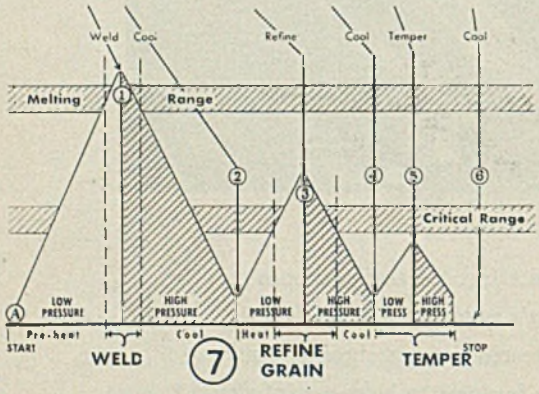


Fig. 4—Frequent interruptions to production spot welding occur when tips mushroom and require frequent dressing as shown at 4A. Cause is inherently insufficient cooling which is remedied with refrigerated tips as shown in 4B where low surface heat minimizes mushrooming and the need for frequent redressing of the tips

Fig. 5—In spot welding, heat is wanted at the junction of the two sheets to be joined not on upper and lower surfaces contacting the electrode tips because surface heat causes pickup or alloying of the work with the electrode. Mushrooming and burning of work also may result

Fig. 6—Heart of the Temp-A-Trol forge welder is the thermocouple electrode—made possible by refrigeration—which actuates the Temp-A-Trol control

Fig. 7—Diagram showing welding and heat-treating cycles applied automatically under precise control in the Temp-A-Trol welder

operating factor (indicating that portion of the total time during which the machine is in operating order) limits the output from any machine. Water cooling enlarged the field for spot welding by making possible fairly long runs before tip dressing became necessary.

However, the expanding uses of spot welding have increased the number of welds to be made so that water cooling is inadequate to meet stepped-up production schedules. Refrigeration appears to be the solution to the problems created by the heavier demands on spot-welding equipment. Since refrigeration greatly reduces down time for maintenance of electrode tips, the operating factor of the spot welders reaches gratifying levels.

Avoids Softened Tips

When cold brine replaces cool water, the tips are kept from overheating and softening, even on heavy high production work. Since softened tips are given to mushrooming under pressure as in Fig. 4A, the avoidance of tip softening as in Fig. 4B saves much down time that would otherwise be devoted to tip dressing. Expressed in terms of production improvement a single campaign may show from 300 to 1000 per cent more welds.

Excessive point trouble has been a problem in welding both aluminum and heavy steel. The characteristic low electrical resistance of aluminum coupled with its great heat conductivity requires the use of high welding currents. High currents mean large heat generation with its attendant alloying of the aluminum being welded and the copper of the tip of the spot welder. However refrigerating the tip removes most of the heat from the tip and so reduces the problem of pick-up to one of almost no consequence.

As heavy steel sections demand both a long time at welding heat followed by application of high point pressure, there is a strong tendency toward mushrooming of the points. This results in short electrode life; introduces faulty spots; and makes not only for frequent but also for protracted machine down time. Removing the surface heat with refrigerated electrodes cuts down the interruptions from the aforementioned causes to a worthwhile extent.

In the final analysis the object is to reduce the temperature at the contact between tips and metal. As is well known, resistance welding depends on the existance of resistances to current flow. When welding two pieces together there are three points of resistance at which heat will be generated. One point of resistance is between the upper electrode and the first piece of metal; the next point is between the two pieces of metal; and the third point is between the lower piece of metal and the lower electrode. Only the middle point of resistance is valuable, while the other two are definitely harmful because they result in generating heat at the extreme upper and lower surfaces of the work: Fig. 5 illustrates fundamentals involved.

Not all of the benefits from well-cooled electrode tips will be found under the heading of increased production. Instead the quality advantages cannot be overlooked in view of the emphasis placed on this factor by the omnipresent ordnance inspectors who are safeguarding the work under their supervision. Better welds, less burned metal, undisputed prior heat treatments and more perfect corrosion resistance of Alclad have all been attributed to the use of refrigerated tips.

Consistently better welds result from a distinctly reduced tendency toward external flashing and from lessened tip mushrooming. As the controls are generally set for an established welding condition, any change in tip size and shape affects the contact area and upsets the pre-arranged welding cycle.

Too, heated tips on large work may introduce more than the desired amount of heat into the weld. These circumstances may bring about *burned* metal in steels of susceptible analysis with oxide envelopes forming around the grains and interfering with the inherent ductility of the structure. Controlled temperature in the electrodes helps to lessen the danger of this phenomenon.

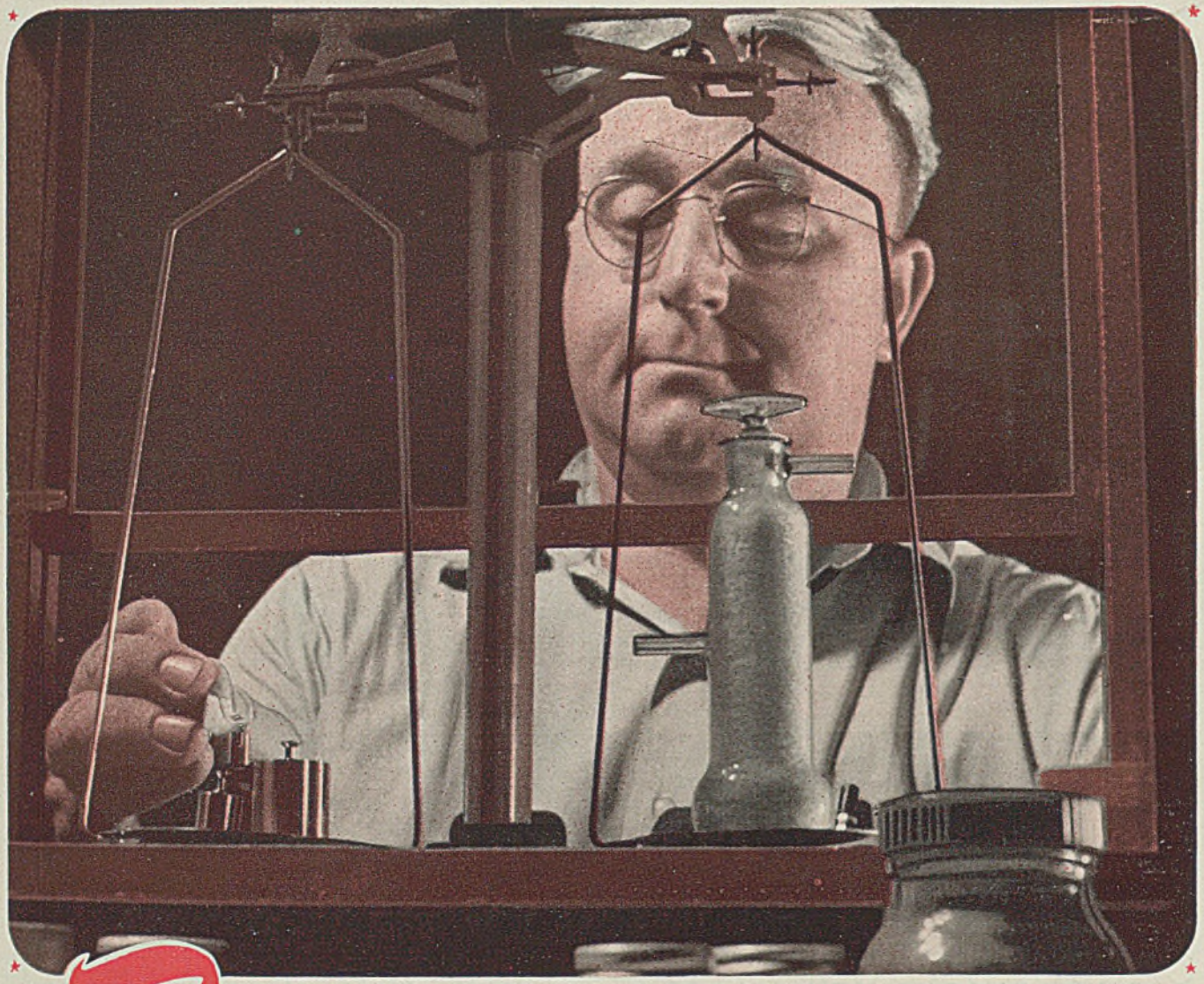
Cooler Tips Improve Weld

Improved welds in armor and other heat-treated plate become possible because of the cooler tips.

Annealing of the hardened surfaces, a condition that might otherwise be brought about by hot tips, is avoided when refrigerated tips are in contact with the treated surfaces.

Alclad, of course, depends for its resistance to corrosion upon the thin layer of pure aluminum that is exposed to the corrosive atmosphere. Any alloying of this surface with electrode material poisons the aluminum and brings about a condition of lessened corrosion resistance. Since, as has been mentioned before, the cold tips eliminate pick-up, Alclad welded by this process retains its original great corrosion resistance.

Although cost considerations are more or less secondary to those of production speed and quality, they must not be overlooked. This is especially true since lower costs permit the purchase of more units under an established budget. Refrigerating electrodes saves man-hours of labor through increased output resulting from less down time; saves cooling



OEM Photo by Palmer, in an Allegheny Ludlum Plant.

Rx FOR ALLOY STEEL

[Accurate to 1/1000 of 1 per cent]

QUALITY in the manufacture of stainless steel—that is, high fidelity to the properties required, and consistent uniformity over shipment after shipment—requires constant control and research.

In Allegheny Ludlum laboratories, chemists weigh the elements of each stainless melt to determine its exact composition. Analysis is determined to 1/1000 of 1%, for each element in the steel. Nothing is left to chance that will prevent waste of these vital alloys, or protect the faithfulness of the steel to specifications.

That is the background of Allegheny Stainless when it comes to you as a raw material. And it's only half the story. The major importance today lays in what you *do* with the steel . . . how fast you turn it into finished war equipment and parts; how little of it is wasted in rejects or spoilage. Stainless steel is a critical material; even the use of a high alloy, where a lower one would do the job, is a loss out of the nation's reserves.

• Can you improve your use of stainless, either to save time or material? All of our technical resources, printed or personal, are ready to help you.

AL
STEEL FOR THE NATION'S WELFARE

Allegheny Ludlum
STEEL CORPORATION
GENERAL OFFICES: PITTSBURGH, PENNSYLVANIA

water in amounts as great as 80 to 90 per cent; saves material from the scrap heap because of fewer rejections of faulty welds; saves electrodes by increasing the life obtained from them; and saves expenditures for new equipment by almost doubling the production from each machine over that possible with the older conventional types. Fig. 2 shows the cooling unit that does the work, while Fig. 1 illustrates that the cooling system may be applied to portable as well as to rigid, stationary units.

Yet another advantage in the use of refrigerated tips occurs in the "Temp-A-Trol" forge welder made by the Progressive Welder Co., Detroit, and shown in Fig. 3. Here a thermocouple, as depicted in Fig. 6, is imbedded in the electrode. It is used to control the operation of the welding machine rather than the conventional controls based on regulation of "current" and "time". Without refrigeration it would be impossible to use an imbedded thermocouple in direct contact with the metal at welding temperature. Both welding and heat treatment of the completed spot are made possible by this device.

The usual spot weld has a coarse grain structure which has proved to be adequate for many requirements. However, there are times when the fine grain structures associated with a heat-treated weld would be more desirable. The "Temp-A-Trol" welder will make a weld by bringing the temperature to an exact predetermined value above the melting point regardless of normal variations in metal thickness, varying induction losses and the like. In a second step, the spot is brought to a temperature which will control the grain refinement by proper final decomposition from the original austenite. In the third and final step, the weld may be drawn or tempered, if desired, to produce the exact physical properties needed. And all this is done completely and automatically in accordance with pre-established conditions. Fig. 7 shows a complete "Temp-A-Trol" welding cycle.

Also Heat Treated

As alloyed and high-strength steels assume more prominence in present-day spot welding activities, the introduction of controlled heat treatment in spot welding makes possible the introduction of this resistance welding method in applications for which it was formerly unsuited. Brittle heat-affected zones as well as weld sections with improper grain structures were serious handicaps to the spot welding of certain steel analyses. Today, with post-heating a possibility, the elimination of some locked up stresses while bringing the weld and affected zone to their optimum conditions extends the general utility of the spot welding method. And, conversely, the welding of face-hardened armors may be done without destroying the surface treatment by using refrigerated tips with a cycle controlled by weld temperature. Just enough time and temperature, *and no more*, becomes possible.

Thus in addition to the many benefits already realized since the introduction of refrigerated tips, the field has been enlarged through thermocouple control for precision heat treatment of spot welds. The thermocouple, without restricting tip dressing in any degree, measures the temperature at the surface of the weld, thereby making it possible to repeat results consistently and automatically under a wide variety of conditions of welding. Temperature difference from the surface to the weld nugget is closely related, thus enabling the controls to be set for proper results.

Refrigeration of electrode tips has improved production and weld quality. By permitting thermocouple control, it brings many hitherto critical steels into the realm of weldability. Certainly refrigeration has brought spot welding a long step forward.

CARBORUNDUM STORY IS TOLD IN EXHIBIT

The important part which man-made abrasives play in the fabrication of edge tools, precision instruments and other steel products is graphically presented in a recently opened exhibit at the Museum of Science and Industry in Chicago. Donated by the Carborundum Co. of Niagara Falls, N. Y., the display presents the story of Dr. Edward Goodrich Acheson's creation of carborundum 51 years ago and traces the development of its manifold modern industrial uses.

Portray Production

Focal center of the exhibit is a huge conical mound of carborundum crystals, set on a black marble base and slowly revolving beneath ceiling flood lights, which cause the irridescent crystals to glow and sparkle with rainbow beauty.

Production of the "Carborundum" brand of silicon carbide and "Aloxite" brand of aluminum oxide is portrayed in dioramas representing sections of the Carborundum Co. factory. Printed cards explain operation of the electric furnaces, then the processes of crushing and grading the abrasives, the making of grinding wheels, disks, sheets and belts required for different industrial purposes and the truing of abrasive wheels.

By H. H. Slawson

A display case close at hand shows steel slabs in the process of being worked down by a rough shaper, a milling cutter, coarse, medium and fine grinding wheels, until the "ultra" finish required for auto parts, precision tools and other products is attained. Graphs giving scientific surface readings indicate what each step accomplishes.

Manufacturers of simple grinding and surfacing machines have supplied actual equipment used for the practical tasks assigned to abrasives throughout the industrial world. A huge photomural montage provides life-size glimpses of that same world of machines shops, woodworking, cutlery, shoe and other factories.

Turntables set in alcoves and operated by the visitor permit examination of edge tools, automobile and airplane parts, and other common objects in whose precise production abrasives are essential.

One unique feature is a "guessing game" where, on pressing a button, one can verify his guess as to the comparative hardness of various materials. Strongly registered thereby is the fact that, next to the diamond, man-made carborundum is the hardest substance in the universe, with aloxite a close contender.

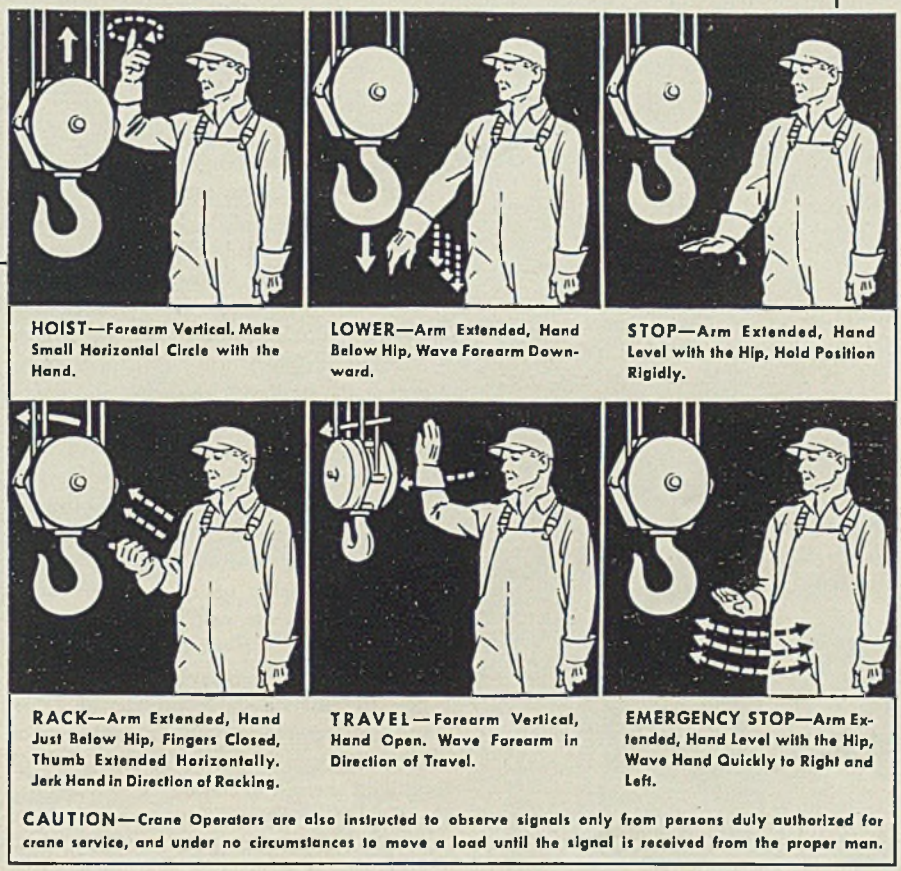
"Talkie" Tells Story

A talking motion picture recreates the historical moment which climaxed Dr. Acheson's search for a better abrasive than those previously available for grinding, and the film continues with a tour of Carborundum's plant and a trip through industrial America. Especially impressive is one statement coming from the sound track. Dr. Acheson's first carborundum crystals, you are told, sold at the rate of $880 per pound. Today you can get a pound for a few pennies. Packed into that is the story of a typical American industrial enterprise which started humbly and today enjoys an influence on this modern machine age which no one can measure.

STANDARD SIGNALS

. . . . make crane operation safer and faster

By F. M. BLUM
Assistant Manager
Crane Division
Harnischfeger Corp.
Milwaukee



OPERATING an overhead traveling crane efficiently and safely calls for teamwork. The man at the controls and the floormen must use the same "language"—which means a clear-cut signal system.

Without such signals, a moving crane hook, with or without a load, can be as great a menace to safety as it is an aid to handling materials. This is more true now than ever before with so many plants crowded and busy with hustling war work and with a constantly increasing number of inexperienced men entering factory jobs. Today, when the nation needs productive man power so badly, safety regulations are more important than ever.

To step up crane efficiency and as an extra precaution against accidents, now is a good time to make sure that your cranemen know and use the standard operating signals illustrated in the accompanying diagrams. These signals are universally used. They are simple, easy to remember, and can be learned with only a few minutes of practice.

HOIST—Forearm vertical. Make small horizontal circle with the hand.

LOWER—Arm extended, hand below hip, wave forearm downward.

STOP — Arm extended, hand level with the hip, hold position rigidly.

BACK — Arm extended, hand just above hip, fingers closed, thumb extended horizontally, jerk hand in direction of racking.

TRAVEL — Forearm vertical, hand open, wave forearm in direction of travel.

EMERGENCY STOP—Arm extended, hand level with the hip. Wave hand quickly to right and left.

As a further precaution against trouble, it would not be out of order for plant foremen on floors using overhead cranes to put floormen through signal drills at periodic intervals. This will assure adherence to the standard signal system. Plants using crane crews are less likely to experience trouble on this score.

In any event, it is quite important to instruct the crane operators to observe signals from a crewman and under no circumstances to move a load until signal is given by some one duly authorized to direct movements of the crane.

Ferric Sulphate Cleans Scale Formed on Brass

Ferric sulphate has been found by Monsanto Chemical Co., Everett, Mass., to do a good job of removing ugly black smut and red cuprous oxide scale from the surface of brass.

The stain and scale in the manufacture of brass buttons, for example, are formed by the annealing operation which removes internal strains set up by the stamping and forming of the cold metal. It is necessary that the stain and scale be completely removed to obtain a mirror-like surface when the brass is burnished.

The advantage of ferric sulphate, according to Monsanto, is that it removes the stains more quickly and with less loss of metal, thus better preserving the design on the button as well as conserving metal.

Ferric sulphate is used for the same purpose in the manufacture of brass cartridge cases. Since the making of a cartridge case consists of a series of drawing and annealing operations, it is essential that all scale and stain be removed before each draw or there is likelihood of fouling or breakage of the drawing dies.

Less Vital Metals Used In Laminated Contacts

Gibson Electric Co., Pittsburgh, is now offering its Gibsiloy contacts in laminated metals in which Gibsiloy materials and base metals are combined to obtain the best features of each.

Use of Gibsiloy as a facing on the contact surfaces with an inexpensive base metal for backing material is reported to lower contact costs and conserve vital metals. Contacts are offered in both inlay and overlay types.

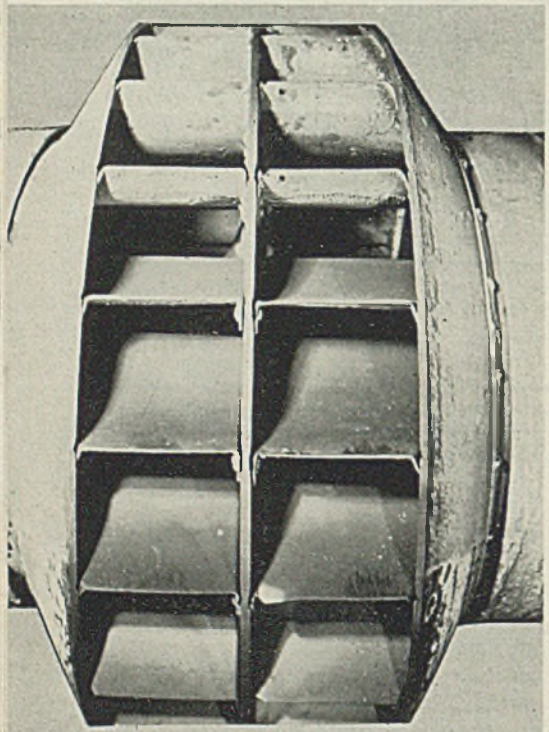
FLY ASH EROSION

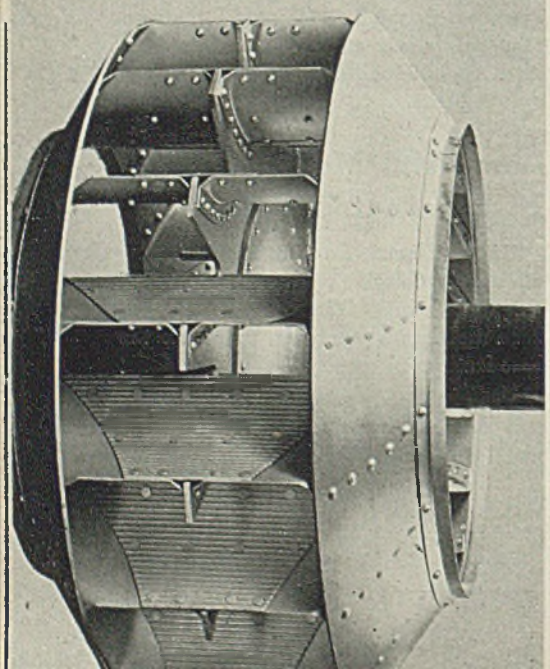
In Steel Mill Boilers

By J. H. REID
District Engineer
B. F. Sturtevant Co. Inc.
Pittsburgh

COMBUSTION ENGINEERS have applied the term "fly ash" to the solids entrained in the waste gases which result from the combustion of pulverized coal in suspension. Fly ash erosion in steel plants presents the same problems as it does in any other power house fired with pulverized fuel, be it domestic, industrial or public utility.

Ash always has bulked largely as a nuisance factor in the combustion of coal regardless of whether furnace units are pulverized or stoker fired. It is well, therefore, to bear in mind that "ash is ash" and presents similar problems regardless of the type of firing used.





Few deposits of hydrocarbons are so pure that they will lend themselves to the chemical process known as combustion without leaving a solid residue. Coal contains such a residue. To utilize combustibles to their full value, man must accept the bad with the good and devise ways to economically burn the fuel nearest at hand, even though it contains a high percentage of noncombustibles.

It is commercially impractical to separate ash from coal prior to introducing it into the combustion cycle. Like nitrogen which makes up a large percentage of combustion air, ash must be tolerated in this combustion cycle and disposed of when the cycle is complete. Unlike nitrogen, fly ash is a stable product and does not again combine with air as do carbon and nitrogen. It must be disposed of, without the aid of nature.

Coal from many different seams is used in pulverized fuel fired furnaces. Most coal deposits have been classified. Many of them contain 10 to 15 per cent ash. Some power plants burn refuse coal which may have an ash content in excess of 20 per cent.

Little data are available on the actual chemical analysis of ash from different coal deposits. A chemical analysis of one sample is given here to indicate the materials that make up the product fly ash.

Coal	Freeport Seam
B.T.U. content	12 to 13000
Ash content of coal, %	12 to 13
Combustible in fly ash, %	8.7
Silica, %	40.6
Aluminum oxide, %	36.7
Iron oxide, %	9.6
Magnesium & calcium oxide, %	2.0
Sulphur dioxide, %	—
Moisture & other impurities, %	2.4
Total	100
Fineness,	68 per cent less than 38 micron

The period between the first and second World War was devoted to the development of high-pressure steam generating equipment. Although not recognized so clearly, it also was devoted to the high pressuring of equipment into a given space.

In steel plants, economy requires that the steam be generated close to the center of the plant. Conserving space (real estate) becomes highly important also conserving materials. This has resulted in packing steam generators into restricted space. The practice of installing new combustion equipment in existing buildings further has tended to increase the amount of heat liberation per cubic foot of combustion space, and this in turn necessitates high delivery velocity of air to the combustion zone and equally high exit velocity of the waste gases of combustion.

The net result of this trend in design has been two to three and even five times as much heat liberation per cubic foot of space, with a resulting increase in the amount of coal and air supplied to this space and liberation of steam, gases and ash from that space.

The inevitable results of high combustion rates readily are seen in the waste gases of combustion. Much of the ash residue is tapped off or deposited in the boiler sections. The percentage of ash that does reach the boiler uptake depends on the design of combustion unit, the class of coal and its state of preparedness, also, the skill of the operators. Fineness of pulverization has a great influence on this factor. In the average unit, probably 30 to 50 per cent of the ash reaches the boiler uptake. This means a dust loading of from 2 to 3 grains per cubic foot of flue gas.

The combustion cycle being complete at the boiler uptake or air heater outlet, the waste gases can be liberated to atmosphere. The fly ash also can be disposed of in the same way. The result will be pollution of the atmosphere and serious erosion of the induced draft equipment.

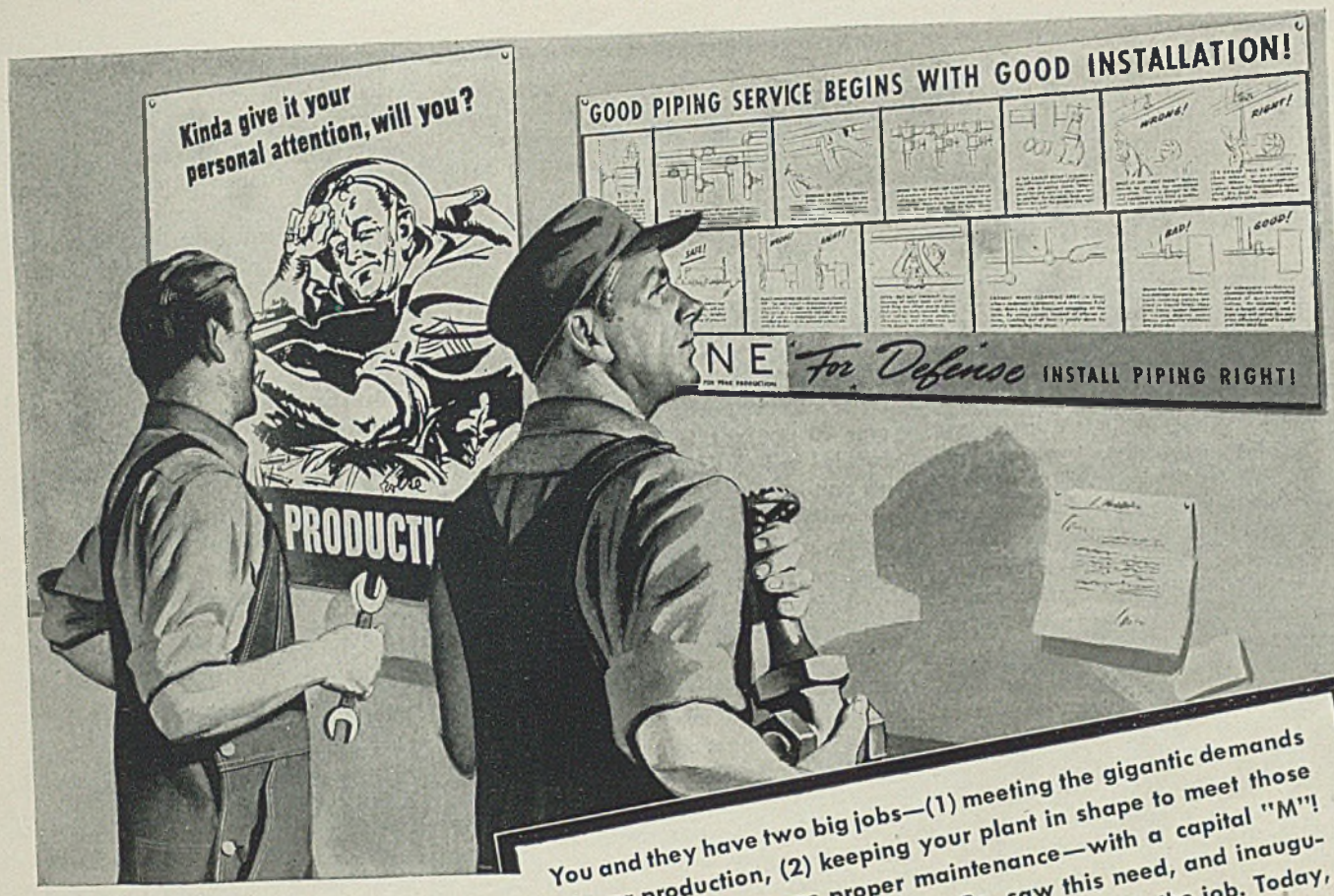
The obvious step is to separate the ash from the gases at this point. Many devices now are being used for the elimination of fly ash.

Induced Draft Fans

The costs of maintaining induced draft fans when they are working under erosive conditions has become one of the most troublesome factors in the operation of

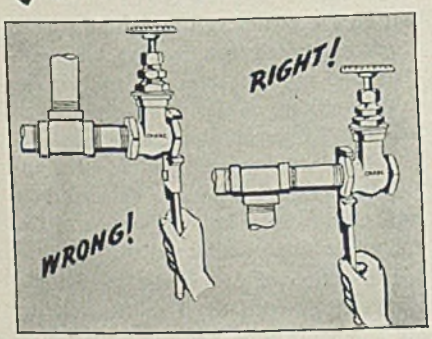
Fig. 1—Erosion attributed to concentration of ash at the center support of the wheel

Fig. 2—Center obstruction removed permitting streams of concentrated ash to meet. Liner covers blades at point where wear occurs



HELP FOR FIGHTERS ON THE *Home Front*

You and they have two big jobs—(1) meeting the gigantic demands of war production, (2) keeping your plant in shape to meet those demands. That means proper maintenance—with a capital "M"! Long before Pearl Harbor, Crane Co. saw this need, and inaugurated "Piping Pointers"—to help you and them do the job. Today, these Crane bulletins on better installation and care of piping are training new workers and spreading the gospel of proper maintenance—for peak production, for conservation of critical materials —for Victory! These examples show how they're doing it.



TREAT PIPING RIGHT is rule No. 1 in making present valves and fittings last longer —give maximum service. In "Piping Pointers," Crane tells maintenance men exactly how to do it—how to avoid little careless habits that shorten the life of equipment—how to prevent replacements now when replacements are harder to get.

PICKING THE RIGHT VALVES for specific services is a sure way to eliminate interruptions and delays in production lines. "Piping Pointers" give clear directions on valve selection. Workers using this service know when, where, and why to install gate valves—when to choose globe, angle or check valves.

FOR TRAINEES OR VETERANS—Men who never handled a wrench before quickly grasp the *do's and don'ts* and *rights and wrongs* in "Piping Pointers." They keep veterans up-to-date on *"kinks"* that speed up work and step up efficiency of piping. For plants using this Crane service, it means fewer shutdowns—*more production!*

FREE—TO ANY PLANT—TO HELP SPEED VICTORY! Your local Crane Representative will gladly supply "Piping Pointers" on request. Or, write to the address given here.

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power plants.

Discussion of erosion can best be carried on by an analysis of a definite installation. In 1936, three large boilers were purchased. They were to be fired by pulverized coal from a Western Pennsylvania seam. Inquiry for fans gave the following peak conditions for each of the induced draft fan units:—870,000 pounds gas per hour per unit at 455 degrees Fahr., 332,000 cubic feet per minute at 16" static pressure. Fan specifications further stated that electrical precipitators were to be used between air heater and fan. Also, due to the width of the air heater and other space conditions, two fans per boiler were required.

Consulting engineers working with the fan designer determined that because of the protection afforded by the precipitators, erosion would not be a serious factor. Two induced draft fans with 5½-foot diameter wheels were installed per boiler, to work in parallel.

Boilers were put in operation during 1937, and their inspection after 18 months indicated that erosion was slight. Based on this inspection, it was predicted that fans would not require repairs, due to erosive conditions, for five years or more. In 1941, erosion became severe and at the present time, fan blades must be renewed every six to nine months.

An analysis of operating conditions at this plant gave some startling data as to the cause of the increased erosion. This analysis is given graphically in Fig. 3 and shows the erosive factor for these particular units. The year 1938 is considered as unity and ash content of coal was 12.2 per cent in 1938.

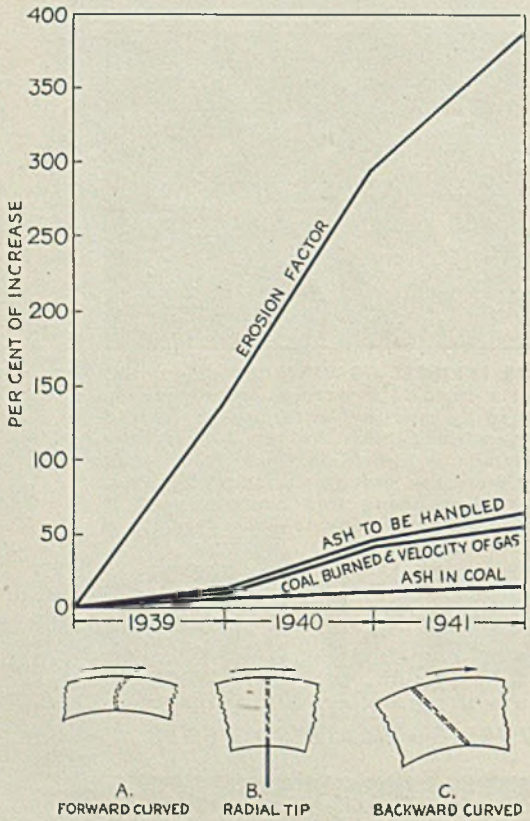


Fig. 3—Erosion factor of three large boilers served by two induced draft fans each

In establishing the erosion factor, it has been assumed that erosion varied directly as the total amount of the ash in the coal, and also, that it would vary directly as the square of ratio of velocities of the gas through the fan. This analysis indicates that erosion would be four times as severe in 1941, as it was in 1938. Actual experience proved this to be true.

In making this analysis, it was assumed that the efficiency of the precipitators remained constant even with an increase of over 50 per cent in the volume of gas handled and an additional increase of 15 per cent in dust loading. Undoubtedly, the separation efficiency decreased with the higher loads, reached in 1940 and 1941. This would further increase the erosion factor. It also was assumed that the chemical and physical characteristics of the fly ash did not change. The fly ash passing through the fan in 1941 could well be more erosive, disregarding velocity and quantity, than that encountered in 1938.

Ratings Were Not Exceeded

The boilers, furnaces, precipitators and fans did not operate in excess of the ratings for which they were designed. The precipitators removed from 80 to 95 per cent of all the fly ash before it reached the fans.

A definite conclusion can be drawn from the analysis, namely, that even with the use of high-class ash eliminating equipment, erosion is sure to be the result of high ratings.

The amount of erosive force stored in a given particle of fly ash can be expressed by the time honored equation, $F = MA$. This erosive force is not effective until the particles come in contact with the duct that encloses it. That is why fly ash can be conveyed at high velocity in a straight duct without encountering an undue amount of erosion. Change the direction of flow, however, and rapid wear will result, since it causes the particles at one surface of the stream to impinge on the concave side of the directing elbow and also sets up centrifugal forces which concentrate a large percentage of the total dust at the concave side. Centrifugal collectors are all based on this principle.

In passing through a centrifugal fan, gas and ash must change direction frequently and usually at high velocity. Erosion is sure to result and can be reduced in magnitude only by reducing the velocity and the angle of change.

The speed of an induced draft fan, either in revolutions per minute or peripheral velocity of the wheel, is not an indication of the erosion that will result.

Fig. 4—Blade design of three types of fans

Fig. 4 shows the blade design of the three types of fans most commonly used. For a specific duty, type A, the forwardly curved blade will have the lowest peripheral velocity with type B and C being progressively higher. The velocity of air, or a particle of dust leaving the blade, however, will be higher for the low-speed type.

Two components make up the velocity of air from a fan wheel:—

1. *VR*, the Radial component

This value is obtained by dividing the volume flowing by the free area at the periphery of the wheel.

2. *VN*, the Whirl component

This value is obtained from the formula:

$$VN = \frac{G \times H}{E \times WR}$$

Where:

$G = 32.2$

H = total head on fan in feet of air.

E = total efficiency of fan.

WR = peripheral speed of wheel in feet per second.

G and H are constant for any type of fan used. If all types are selected properly, E will not vary widely so that the whirl component of velocity will vary inversely as the peripheral speed. The resulting velocity is:

$$V = VR^2 + VN^2$$

A complete analysis will show that the low-speed fan has an exit velocity as high and often much higher than other types.

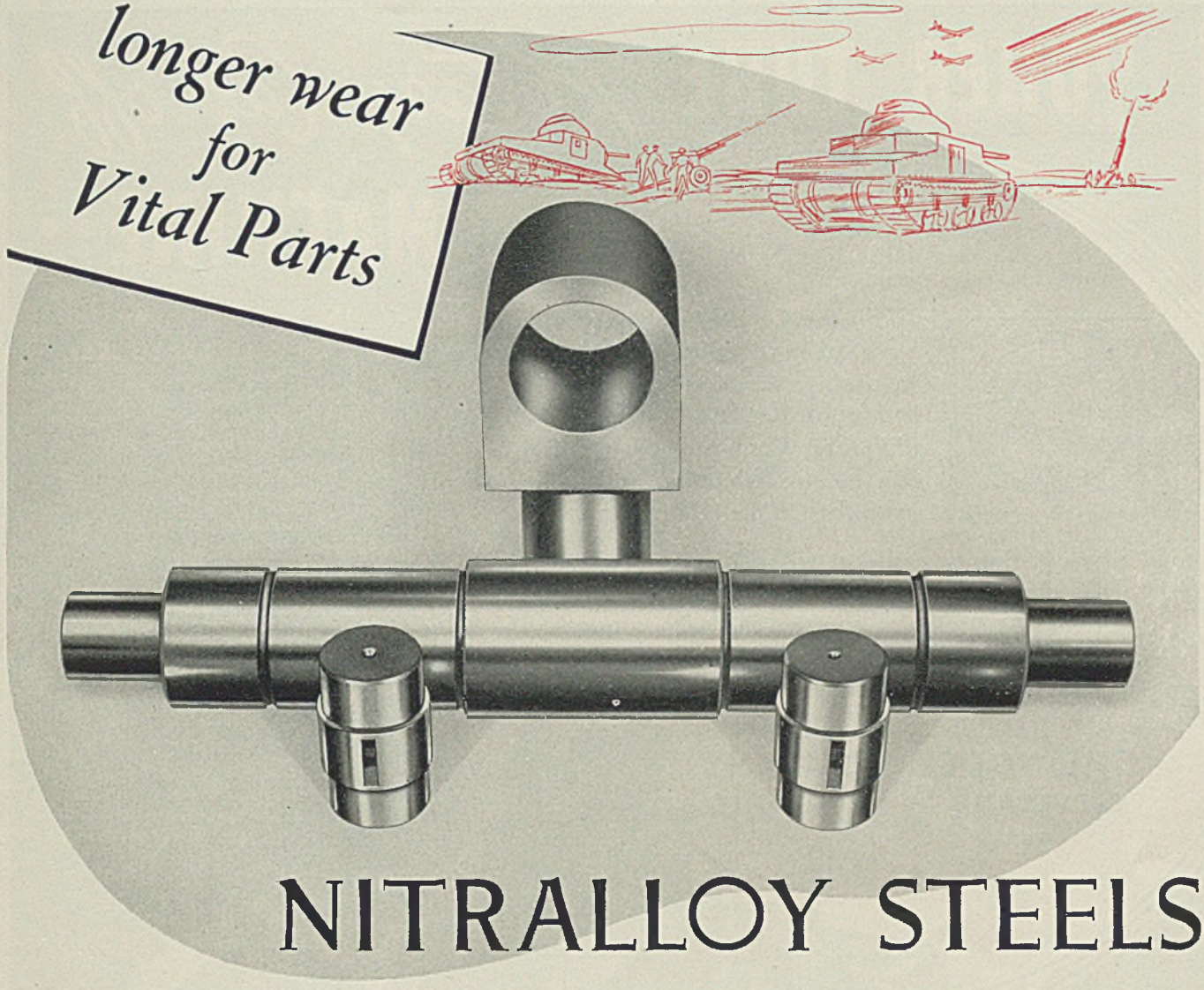
Change of direction of the particles of ash on the blades will increase the wear. It is to be noted that the type A has constant and rapid change of direction. The ash is working on the concave side of an elbow. Change of direction lessens progressively with types B and C. The application of type C fans to induced draft work, however, is limited because of the limitations in structural design.

The action of fan blades on the gas ash particles with the resulting velocity and change of direction causes wear. Another change of direction is not directly attributed to the blades.

Gas approaching the inlet of a fan wheel is accelerating rapidly. The change of direction when entering the fan blades causes concentration of ash at the center of the fan wheel as shown in Fig. 1. If the wheel is of the center disk type, this concentration will erode the blades and the center disk at their junction point and become increasingly severe toward the periphery. Elimination of the solid center disk, Fig. 2, permits the two streams of concentrated ash to meet and avoid wear on the main support of the fan wheel.

The same concentration of ash occurs

longer wear for Vital Parts



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War equipment cannot be "babied". Every part must stand up under tough service. The wear resistance of the extremely hard surfaces obtainable with Nitralloy Steels protects vital parts. We are manufacturing Nitralloy Steels for every type of fighting equipment.

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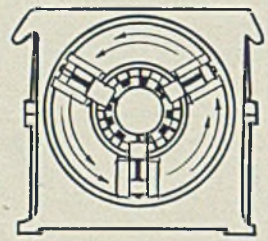
"THE WILL TO MAKE GOOD STEELS"

YODER TUBE *Rotary Cut-off* MACHINE••



This is the Cut-off Machine you have been hearing about so favorably. Its biggest feature is that the TUBING DOES NOT REVOLVE. Consequently, there can be no "whipping" action, even though the tubing is bent.

Also, you're cuts ahead with Yoder's because they are speedier than conventional types of cut-offs. Accurate, of course, and with ruggedness built-in that resists vibration, insuring a long life to machine and tools.

IN IT...THE FEATURE OF ALL FEATURES!

Designed, developed and manufactured by an organization experienced, in general, in the metal forming production machinery field and in particular, in the making of cut-off machines.

It takes a machine designed for PRODUCTION to get PRODUCTION!

Our customers agree that this experience adds something to these machines.

You are invited to avail yourself of this valuable experience. Just tell us of your problem.

THE YODER COMPANY
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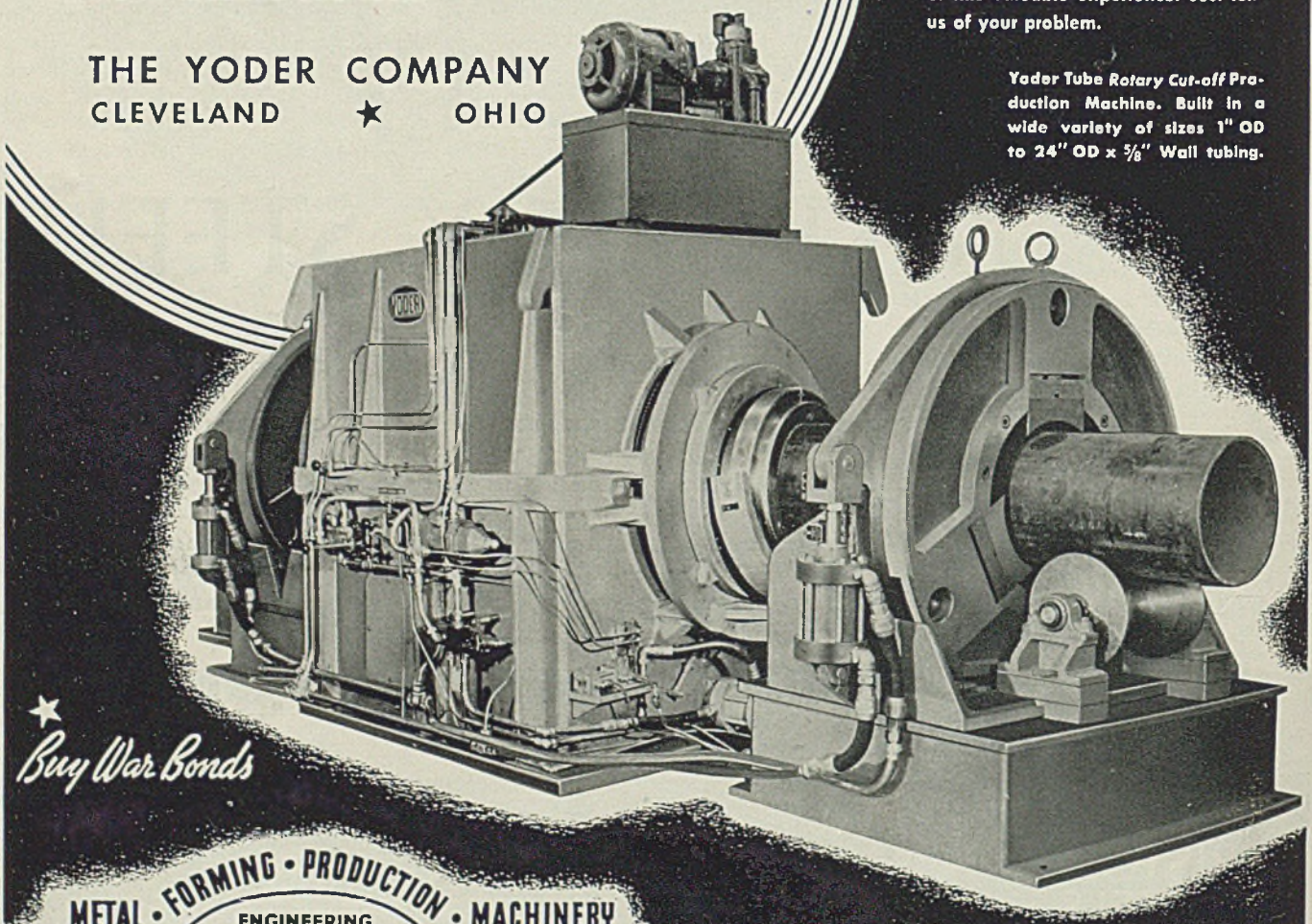

Yoder Tube *Rotary Cut-off* Production Machine. Built in a wide variety of sizes 1" OD to 24" OD x 5/8" Wall tubing.

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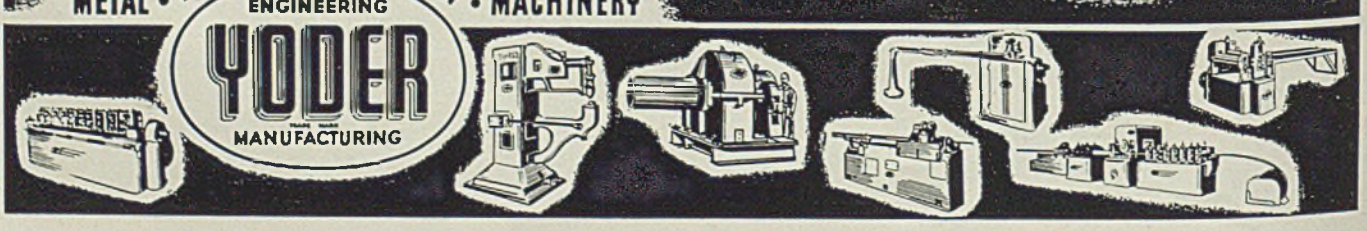


on single inlet fans on the back or side plate remote from the inlet and there is no counteracting stream from the other direction. That is why most fans on highly erosive application are of the double inlet type.

Bad duct connections to the fan inlet will greatly increase the erosion of a wheel. Uniform flow to all parts of the wheel inlet and streamlining of elbows adjacent to that point are highly important.

Materials Employed

Fan wheels which handle large volumes of gas must of necessity have structural members of relatively small cross section and resulting high stresses. From this, it can be seen that a fan wheel is not a rigid structure and requires ductile materials and often necessitates the use of alloy steels. Stating this in reverse a high-speed fan wheel is not the place to use erosion resistant materials. Such materials usually are hard and brittle and often not homogeneous. The use of such materials may combat erosion but will result in complete wheel failure.

Liners either of ordinary carbon steel or hardened materials can be employed to advantage to protect the base members, such as, blades, particularly, when the latter are of alloy steel. Such liners can be renewed quickly and cheaply and their life prolonged by welding at the points where erosion is most severe. See Fig. 2.

The following rules will serve as a guide in the selection of induced draft fans for erosive conditions:

1. Select the largest fan which a competent fan engineer will offer for a specific duty. This gives large gas passages and keeps velocities to a minimum. Check velocities of various types being offered.
2. Select a fan without an intermediate or center obstruction. Have blades protected by a liner. If possible, use a double inlet fan. Give close attention to blade areas and curvature.
3. Install the fan so that gas is distributed eventually to all segments of the wheel inlet. Submit layout of approach and discharge ducts to the fan manufacturer to obtain the best possible setting consistent with the space available.
4. Consider the use of ash eliminators. Even the lesser efficient eliminators will greatly reduce fan erosion.

Since the event of pulverized fuel, induced draft fan design has been a constant struggle to devise ways to minimize erosion. This effort has met with considerable success but the severity of the erosion problem has increased almost as rapidly as improvement in design. Obviously, erosion cannot be eliminated wholly by modified fan designs and a complete solution must be sought elsewhere in the combustion process.

Designing induced draft fans to withstand the erosive effects of fly ash, or eliminators to remove ash after it has passed through the boiler, would seem to be working at the problem from the wrong end. New designs of coal burning eliminating the ash, while it is still in a molten state in the furnace, would be a marked improvement in the art of burning coal. Perhaps the post war period will see such advances in design and the resulting changes will be more marked than those that accompanied the swing from stokers to pulverized fuel.

Brazing Salvages Cutters

By W. H. HANDROCK
Applied Engineering Department
Air Reduction Sales Co.
Chicago

BECAUSE it is necessary to get all possible service from alloy steel cutting tools, low-temperature brazing was suggested as a means of salvaging many of the cracked and broken high-speed steel tools which were being scrapped at one plant. The initial operation was the butt brazing of a 1 x 1 x 3-inch long high-speed steel boring mill tool to a 1 x 1 x 6-inch carbon steel shank to make possible the use of at least 2 inches more of the cutting tool, which previously had been discarded. This tool was then checked in the testing laboratory and on production cutting with very satisfactory results.

This operation created considerable interest, and the plant supervisor inquired concerning other high-speed cutting tools that could be repaired. This led to the brazing of milling cutters, broaches, drills, reamers, etc. Suitable fixtures were made for alignment of the broken tools.

This plant now has a separate welding crib assigned for this work with regular operators who work on tool salvage only. Operators use torches with single and 2-flame tips for heating and are using 3/32-inch diameter Easy-Flo wire on all work.

The largest single item to date was the brazing of a $400 reamer on which the estimated cost for preparation and brazing was approximately $5. For a single month it was estimated that $6000 had been saved by reclaiming cutting tools.

On all tools which are broken in two or more pieces, the abutting surfaces are cleaned with carbon tetrachloride, coated with Handy Flux and then tinned with Easy-Flo over the entire abutting surface. The broken sections are then matched up and placed in an alignment fixture and heated within as small an area as possible adjacent to the abutting edges until the Easy-Flo melts and completes the braze.

Care is practiced in heating high-speed steel to complete the braze with as little heat as possible. On tools which are cracked only, as is the case on many milling cutters, the crack is veed on one side only by grinding. The vee is ground ⅛-inch deep and ⅛-inch wide and clamped with the vee up during the brazing. This small groove acts to mold the brazing alloy during the brazing operation until it has penetrated to the depth of the crack. The cleaning and fluxing of course must precede the brazing operation. Grinding as a preparation for brazing is used only on drills and reamers where a square break has occurred. An irregular break serves in alignment and also affords greater bonding surface area.

Considerable discussion arose at the start of this operation, dealing with the effect of the brazing heat upon the hardness of the steel. Laboratory tests disclosed a drop of 2 points rockwell C on hardness readings within an area of ½-inch on either side of abutting edges brazed. Tests also disclosed a strength of 156,000 pounds per square inch on a square butt braze. A similar hardness test made on the same type steel brazed with Easy-Flo in another plant showed a drop of from 2 to 4 points on the rockwell C scale.

The benefits lie not only in lowered cutting tool costs, for the elimination of serious delays in getting replacement tools is especially important. Too, flexibility in procurement of many special tools is of equal value.

Converting

(*Continued from Page 55*)

ing tank and the actual operation of enameling or "laying on" rendered impossible.

We may continue this thumbnail sketch of the facilities of an enameling plant by noting that enameling stock must be prepared by cleaning, rinsing, pickling, neutralizing and drying operations. Further, suitable dipping, spraying and drying arrangements must be made. Then, too, furnace equipment of the continuous or batch type, depending on the nature of the work, must be provided. Fig. 9 shows a typical batch-type muffle furnace fired with a single oil burner. In operation the piece to be fired—generally in the form of large flat sheet—is laid on a rack set with a great many points like an inverted harrow and placed in the furnace by means of an air-operated fork which moves forward and deposits its burden on the refractory supports within the furnace.

Fig. 10 shows the same furnace converted to annealing, stress relieving and spheroidizing operations. The muffle has been removed and a car bottom provided; and the number of burners has been increased from one to seven. This particular plant, Baltimore Enamel & Novelty Co., has secured a considerable amount of stress relieving operations on iron castings, and much more is in prospect.

An interesting inquiry, which in this particular case failed to mature, concerned the annealing, straightening and pickling of alloy steel bar. Where the stock does not exceed about 12 feet in length, the typical enameling furnace is well adapted to this class of work since it normally operates over the temperature range required. However, as in the case of stress relieving operations and more particularly for annealing purposes, the supply of heat to the furnace must be greatly increased. A car bottom, of course, is essential, and some increase in the capacity of handling arrangements will normally be required since runways and lifting tackle in the enameling plant are ordinarily designed for relatively light loads.

Under the arrangements which were proposed for treating this bar stock, loads of some 25,000 pounds were projected, the cars being run into the furnace at a temperature of 800 degrees Fahr. Suitable precautions having been taken to avoid any large percentage of free oxygen in the furnace atmosphere in order to minimize scaling, heating of the bars to between 1450 and 1550 degrees, followed by a hold of several hours to insure uniformity of heating and thorough transformation, would have taken place. Cooling was to be slow through the critical range—a rate not exceeding 25 degrees every half hour—followed by air cooling from 1000 degrees.

This particular steel was a chrome-molybdenum alloy requiring care in heat treatment in order to avoid checking. Hardness requirements after heat treatment were from 190 to 200 brinell so that after the slight hardening taking place in the straightening operation the specification of 230 brinell might be met. Since the plant was in possession of pickling facilities, the only necessary additions would have been bar straighteners of the Medart type. Work of this sort

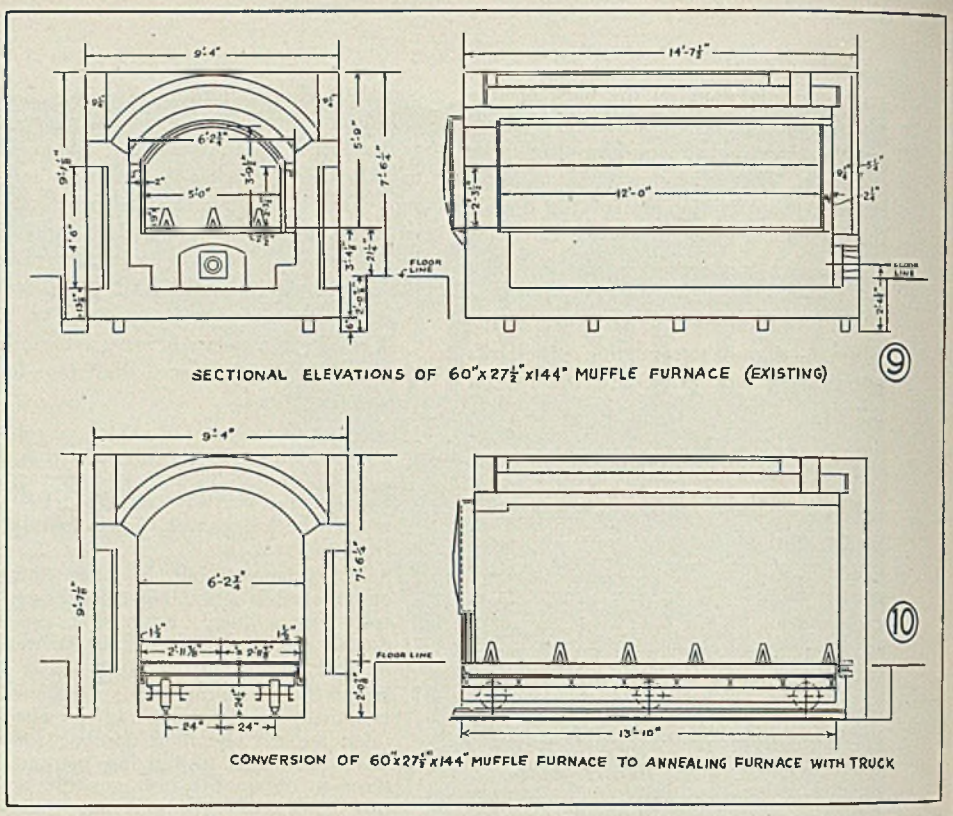
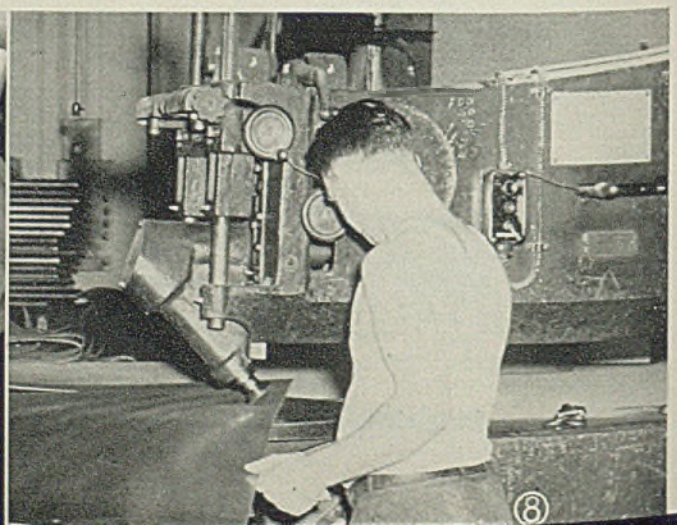


Fig. 9—Typical batch type porcelain-enameling furnaces before conversion to war work

Fig. 10—Same furnace as in Fig. 9 after conversion to war production. Note that the muffle has been removed and a car bottom installed

Fig. 7—Power operated finger brake can be set to bend certain portions of the work as fingers can be removed or added along entire length as desired

Fig. 8—"Quickwork" shear cuts almost any contour as operator can follow scribed lines with the inclined cutter wheel after a little experience. Unit can cut circles up to 8 feet in diameter; also has provision for punching



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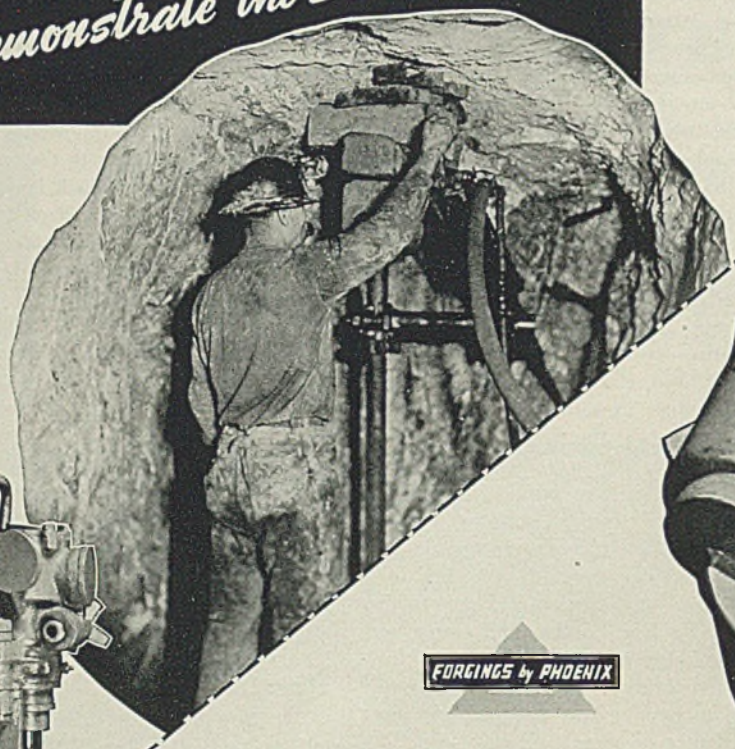

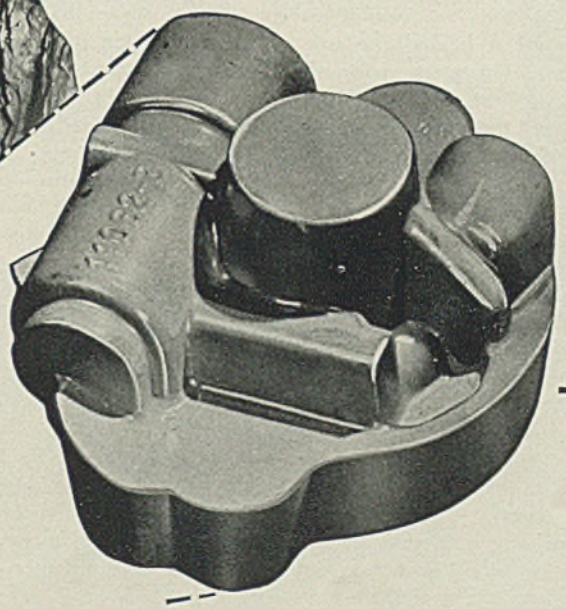

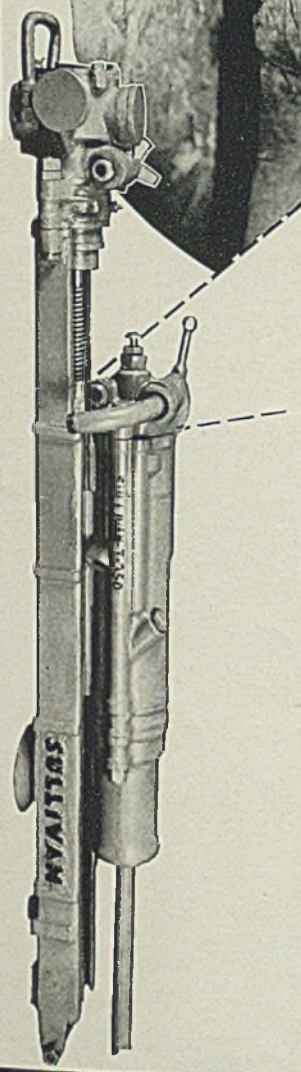

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That's why Forgings by Phoenix were specified by Sullivan Machinery Company in the manufacture of their T-350 Drifter. These powerful drills, pounding away with machine gun rapidity, deliver approximately 1700 blows per minute — 1700 racking jolts that test the strength of every part.

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Forgings by Phoenix lessen dead-weight, require less time to machine and finish, and can be depended upon for maximum tensile, torsional, and impact strength to meet the most rigid specifications.

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Catasauqua, Pa.,

is best undertaken by plants favorably located from a transportation standpoint with respect to steel producer and user.

Thus far, no reference has been made to a large and highly essential department of the enameling plant—namely, the sheet metal fabrication division. Fig. 1 exhibits a typical squaring shear, provided with the usual blank holder and safety guard. In action, the blank holder descends upon the sheet and holds it while the shear cuts it. The depressions in the table provide clearance for the operator's hands as he places the sheet in position. Fig. 2 shows one of the 10-foot shears required for cutting out large signs. We have again a similar arrangement to the last exhibit except that the guard is behind the row of blank holders. Operators, curiously enough, are rarely hurt, although there is nothing to prevent them from getting their fingers under the blank holder.

Double-Action Draw

Fig. 3 shows a characteristic double-action drawing press in which the outer ram or blank holder descends upon the sheet and holds it firmly but not so tightly that slippage cannot take place when the forming punch descends and stretches the sheet to the desired shape, as shown in the hand of the operator. Those interested in the mechanics of this Bliss press may note that the dwell of the cage is obtained by double dead centers. This particular machine is capable of a 6-inch draw, the stroke being 12 inches. Two of the four suspension screws on the slide are in evidence. These screws are normally sufficient to secure the desired control over the friction between the sheet and the ram, but paper packing is sometimes resorted to.

Stock used for enameling purposes is of very low-carbon steel and must be rid of impurities in high degree if successful results are to be obtained. A typical analysis shows 0.13 per cent carbon, a trace of silicon, 0.043 sulphur, 0.036 phophorus, 0.45 manganese.

In days gone by when open-hearth furnaces were much smaller than they are today, such material could be readily secured. But with the increase in capacity of the modern furnace, special arrangements must be made to provide the material required in order that any tendencies toward blisters, fishscale or "jumpers", as this defect is sometimes termed, may be minimized.

Incidentally, such stock can be worked quite easily even when cold. Where considerable strength is required steel as high in carbon as 0.5 per cent may be enameled successfully but only if the silicon content is low. Such percentages, however, tend to produce blisters, and in general soft enamels must be used since the higher the temperature of firing, the greater the tendency toward blistering.

Fig. 4 shows a blanking and trimming press and Fig. 7 a power operated finger brake, used for bending flanges of various lengths. In action, the fingers clamp the sheet and the apron in the foreground swings upward to any desired angle. Obviously the fingers can be so arranged as to hold the sheet over any desired length and so permit the clearing of previously formed portions. Fig. 8 shows a "Quickwork" shear capable of cutting out circles up to 8 feet in diameter. The cutters are so inclined as to produce a "scissor" action, movement of the sheet being assisted by knurling the cutter. This particular machine is also adapted to punching operations, any one or a number of punches being brought into operation at one time by moving the control handles.

Equipment of the type described above should obviously be easy to apply to war production, but early investigations disclosed large capacity of this type over the country at large. Thus after going through the motions familiar to many organizations compelled to seek new lines of business connected with the war effort or starve, the conclusion was finally reached that an attempt would have to be made to re-equip the plant with multi-spindle automatic or other types of shell lathes with a view to a contract for shell manufacture. There followed a lengthy period of negotiation with the local Ordnance Office, during which layouts were prepared and bids secured on all necessary equipment for machining shell of various types and calibers. But many other organizations had the same idea and in all cases in which invitations to bid were accepted the contracts were lost to lower bidders.

Enamels Flues

Meantime a contract had been secured for enameled flues for defense housing and interest once more revived in the possibility of obtaining work more in line with the ability of existing facilities to produce. See Fig. 12. This attitude was further sharpened by the increasing reluctance of the War Department to encourage the establishment of manufacturing facilities in a zone exposed to the risk of enemy airplane attack.

Instead, therefore, of making further efforts to obtain large prime contracts, attention was directed to the needs of major contractors within a limited radius. In this way a variety of work, including ammunition trays and ammunition boxes for merchant ships, aircraft stages for the Navy, together with a variety of parts for the British and American aircraft industries, bus bar boxes, etc., filtered in, each new job presenting a fresh array of manufacturing problems. In these various ways, it has been possible to keep busy the sheet metal divi-

Fig. 11—Research, inspection and control laboratory of Baltimore Enamel & Novelty Co. Here fineness of grinding enamels is checked, degree of adherence of slip measured, shades of color worked out and quality controlled. Furnace in background was recently employed to check procedure for tempering springs used in clamps

Fig. 12—Flues for defense housing war work being done here. Note that welding machine has a donkey attachment which provides reciprocating motion to the head, thus enabling the operator to "sew" up the joint quickly

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Ferro-Carbon Titanium, used as the final deoxidizer and cleanser, improves the quality of rimming steel. Many users enthusiastically report that ingots are cleaner throughout with blow holes deeply seated. Besides, they appreciate the higher production yield that usually results with the use of Titanium. Write for full details.

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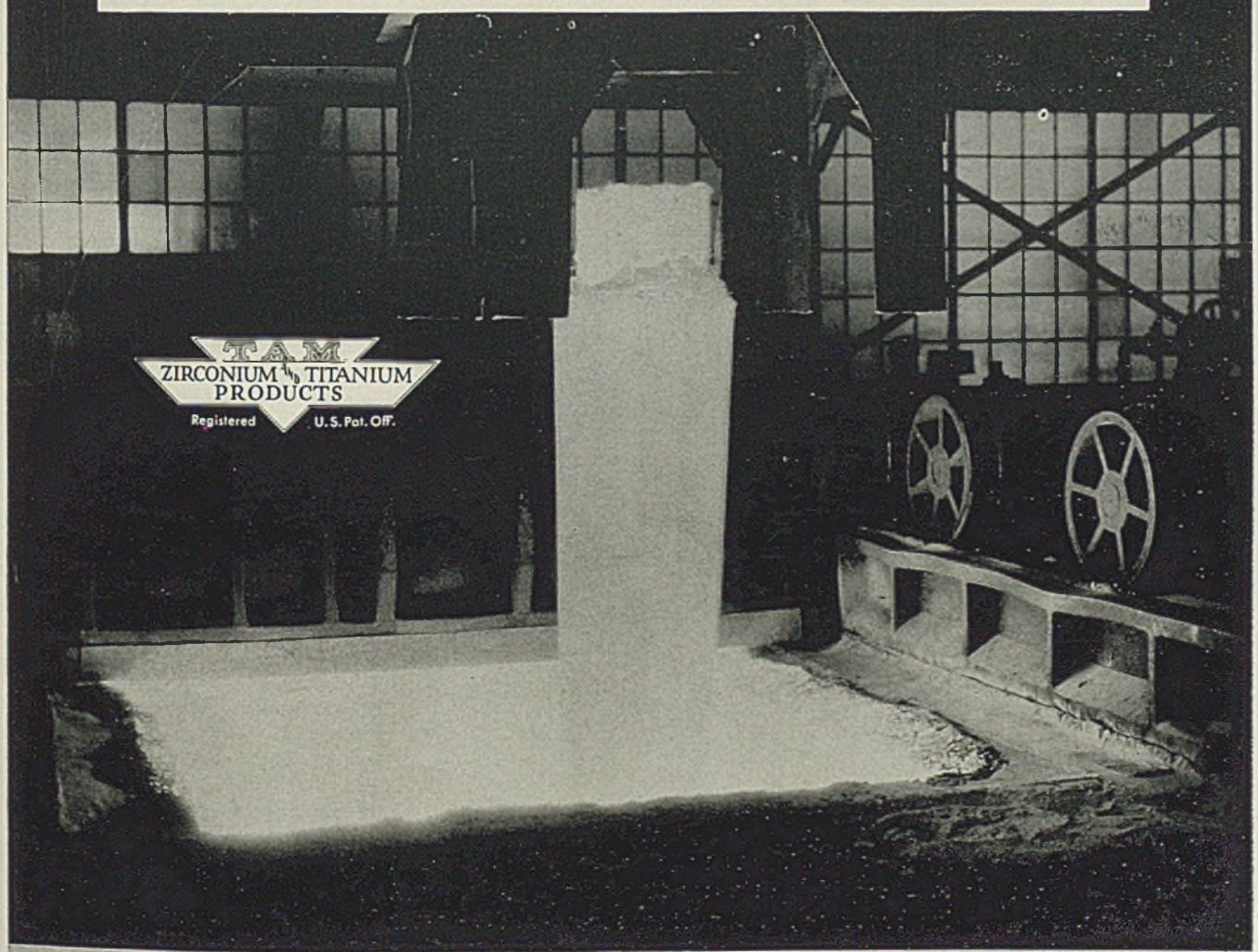

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sion, including spot welding, and to a moderate extent the enameling facilities.

However, as the constriction of steel supplies tightens, important as defense housing is, it is expected that all work not directly concerned with supplying the armed forces will gradually disappear and that more and more furnace capacity will be turned over to heat treatment. What can be done with spraying equipment, enamel mills and pickling facilities is still something of a problem, not to mention the question of utilizing the extensive floor space which is steadily being vacated by enameled ware.

Throughout this changeover period, there has been a full realization of the necessity of applying to the problems of securing war work perhaps more than the normal amount of effort rather than less. The Army and the Navy have a job of their own to do and cannot be expected to beat a path to the door of every mousetrap maker in order to solve his conversion problem for him. For the benefit of those whose experience in the problems of conversion is still somewhat limited, the writer knows of no better guide than a brochure published by the market development division of the American Rolling Mill Co., Middletown, O., entitled" Suggestions for Obtaining War Contracts". It is a mine of helpful information.

The Baltimore Enamel & Novelty Co., by whose courtesy the above information is presented and with whom the author has been associated in a consulting capacity for the past six months, was organized in 1896. At that time porcelain enameling was endeavoring to gain a wider foothold for its commercial products. Certain gifted individuals who sensed the tremendous possibilities of the industry were also aware of the necessity for establishing it upon mass production lines. The company is now one of the largest manufacturers of porcelain enameled signs in the United States. There is hardly a town or hamlet throughout the length and breadth of this country which does not display somewhere a Bell Telephone, Western Union, oil, tire or paint sign made in this plant.

An important contribution by the company to the growing enamel industry was the development of the permanent red enamel color so frequently used today. The only red hitherto available had an orange cast and manufacturers could not guarantee its permanency. Still another forward step was the erection in 1925 of one of the first continuous burning furnaces in this country and the first furnace of this type to be used in sign manufacture. The company also built the first furnace in the country large enough to enamel signs 6 feet high. When signs of larger size than this are required they are made in sections. The latest effort of the company has been directed toward the use of its product in architecture, so we are now back full circle to the days of the Egyptian Pharaohs. Truly there is little that is new under the sun.

An Idea that Speeds Production

SPEEDING PRODUCTION at one of General Electric's factories is the arrangement shown above using an electrically-heated carbon tip for soldering plate-type rheostats used for motor and generator control. Here assembled rheostat plate first is placed in a grounded ratchet fixture. Then the carbon tip is lowered into contact with one of several rheostat buttons to be soldered—the button quickly heated and the solder applied. Operator then rotates plate by foot lever to bring other buttons into position for soldering

Develops Tack Rag For Finishers

O-U-Tack, a new tack rag that eliminates use of solvents and saves time in cleaning dust and over-spray prior to painting, is announced by Robinson Specialty Mfg. Co., 816 West Fifth street, Los Angeles. It is reported to be flexible as to tackiness and does not dry out in storage.

The tack rag is claimed particularly applicable when preparing aircraft skins for synthetic enamel as it completely removes metal dust and other minute particles developed in drilling and riveting. Feature of the product is that if more tackiness is desired it can be secured by applying heat—if less, by hanging in open air.

G.E. Announces Super Phosphor for Lamps

Development of a super phosphor, more efficient in ability to convert invisible ultraviolet into visible light than are powders heretofore used in fluorescent lamps, is announced by General Electric's lamp department, Nela Park, Cleveland. Designed for use as a coating on the inner surface of Mazda lamps, it is said to have the added advantage of employing minimum amounts of critical war materials.

Referred to as "Formula No. 188-C3", the new super phosphor powder already has been incorporated in the manufacture of F lamps. The improved powder, experts point out, is another contribution toward helping war industries to increase production. It, in effect, is regarded by the engineers as a new "tool" which automatically will lend material aid in the nationwide drive to smash lighting bottlenecks.

Production Illustrations

(*Continued from Page* 60)

ment necessary for actual manufacturing operations. By the use of such sketches, jig and tool designers are given a means by which they can quickly grasp the essence and ramifications attendant to each separate major assembly of the product.

Still another use, already proved of great value, has been in compiling of data on new models. The illustrations may be assigned "per operator" for each functional job on the line, thereby making it possible to introduce a new model into production with a minimum of delay caused by unfamiliarity of the assembly operators with the individual jobs they have to perform. Such drawings originate either from preliminary design drawings, experimental mockup or the proto-type test product, and must be so simple and clear that a new employe can understand his duty on virtually his first day of work.

By including jig and tool requirements for each job as part of a production illustration, still more time is saved. The line employe, whether new on the job or filling a working position with which he has been familiar for some time, finds it unnecessary to experiment or interrupt the work of others to learn what tools to use and how to do the job. No time is lost in repeated trips to the tool crib.

Production illustrations will prove of inestimable value to the armed forces in the field by clearly indicating proper use and servicing procedure in service and repair manuals. In this use their value can best be judged by correctly assuming that the need for simple, clear information is not limited to informing about new products or new models, but rather in informing new users, millions of them in the armies, navies, air forces and related services of all of the United Nations. Production illustration sketches are the universal language all can read and understand.

Production for war, and that of peacetime, too, can be speeded up; more or less inexperienced help can be used on assembly lines; plants can be planned speedily; tool and equipment design can be originated, manuals illustrated and so on, with the help of production illustrations. Many large manufacturers are already using this new method and say it is well worth while.

To get more specific information it is best to go to Douglas Aircraft Co., where the Tharratt idea was developed and perfected and where logically it has been used in the most extensive way to date. There, let production illustrations engineer N. V. Karstens, in charge of the production illustrations department at the company's Santa Monica plant, tell about it. He is one of the original group selected by Mr. Tharratt to launch the department.

How a design originates, with whom, where and why, is another story, perhaps several of them. When, for example, the plans for the door of a bombardier's compartment in a bomber, selected for this study, are finally ready for production, production illustrations go into action again. They've already worked on several phases of those plans, but that work comes under that "other story" heading.

Engineering drawings, parts lists, tool lists, inspection instruction, and construction method data are translated into simple isometric or three-dimensional drawings upon which are imposed the list of numbered parts, the tools, directions for doing the more intricate jobs and instructions to inspectors who will check the finished work. Engineer Karstens explains that his production illustrations department, working in co-operation with other departments, translates complex designs and masses of data into simple but comprehensive drawings that show assemblers just what to do, how to do it and with what tools. And in addition, to clarify further the work where it is necsary, "over all" sketches show the complete job, only part of which may be constructed at any given station or working position.

All this is accomplished with drawings made so pictorial and natural that their blueprints are readily understood and used by a new workman who has acquired a simple skill without taking time to master the intricacies of "blueprint reading".

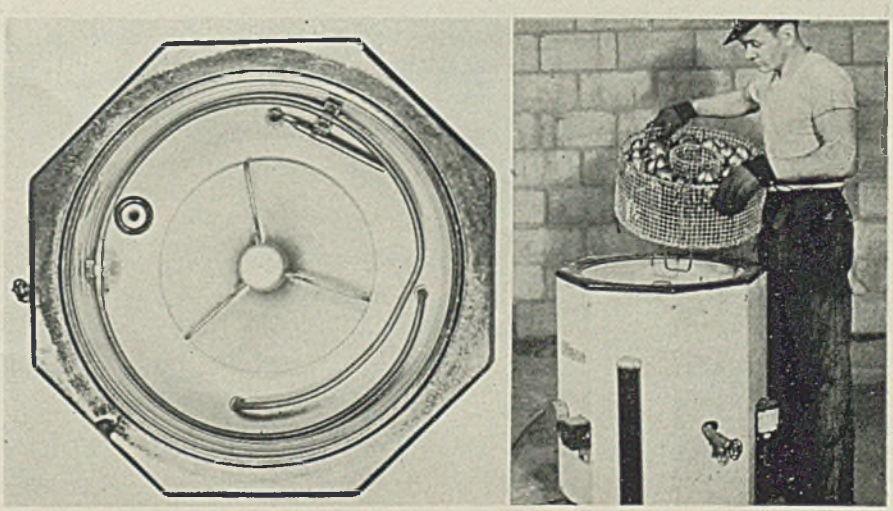
Approximately 500 production illustrations are drawn for each type of airplane manufactured at Douglas. And that does not include the numerous other drawings the department turns out for other than actual manufacturing instruction and guidance.

"We even sketch shipping covers, design crates and show the workmen the safest way to block shipments in boxes and freight cars", he added. "If they need a picture to show them the safest way to load or unload a shipment, we can get that out, too."

When a set of production illustrations is ready for an assembly line, it is reproduced in blueprint form and each station is given a number of copies to cover its particular portion of the job. In most instances a station's set of prints is posted on a nearby bulletin board that may be merely the back of a stock rack, or is an actual bulletin board fastened to a guard railing adjacent to the working position on the line. If, however, a workman needs a particular drawing, he can take it to the point where the work is to be done and follow its instructions as long as he needs to do so.

It is obvious, of course, that after a reasonably competent workman had done a given operation a sufficient number of times to fix it in his mind, he no longer needs the illustration. However, it is at hand if he should forget and need to refresh his memory. And, if changes

"Drafts" Washer for Plant Use



INSTRUMENTAL in the increased output of a small metal specialty manufactured by Koch Mfg. Co., Louisville, Ky., is this second-hand washing machine embodying a General Electric 230-volt Calrod heater. Dubbed the "jiffy" cleaner, the converted household appliance is used both to heat the cleaning solution and clean the metal items simultaneously, speeding the operation about 8 times faster than the former method. As shown, left, the heater is looped around the bottom of the washer, and the metal products to be cleaned are "dunked" by means of a wire rack so they will not strike the agitator or contact the heater

come through, the portion affected can be "killed" on the worker's copy and a new sketch of the part changed then posted adjacent to the portion "killed". If it is necessary the entire drawing is later redrawn to incorporate the change in its position on the sketch.

One notable difference between this new type of production illustrations and usual engineering drawings is the former's total lack of written dimensions. For assembly work, there is no need to clutter them with such detail. The parts shown have already been formed. And it makes no difference to the man on the line whether a part he is working with is 1/16 or 1/32-inch thick. All he needs to know is how to attach it where it belongs, and what tools to use in doing so. Quite obviously, however, dimensions can easily be included where they are needed for fabricating operations.

Some time ago a check of the time saved by the new illustrations was made. Over the signature of Mr. Tharratt, the following memorandum reported the results:

"The time allowed on this job was 9.15 hours, which was the observed time taken by an experienced man. A new man with no previous experience of the job took only 7.2 hours with no supervision whatever when given production illustrations from which to work. The initial time saving was 1.95 hours, which we know from experience can be reduced still further. These two tests are very encouraging and prove the value of clarification by illustration."

In any new development, it is to be expected that the executives who conceived and perfected it, or who have adapted and adoptetd it, will be enthusiastic. And so they are at Douglas, at Lockheed-Vega, at Boeing and all of the others now using production illustrations. But, what about the "ultimate consumer", the men and women who direct the actual production work or who do it on the line? To get their views typical Douglas workers were asked about it. Here is what they had to say:

Robert Farley, a co-ordinating supervisor—"If a new man can read and understand the 'funny paper' on Sunday, he can read and understand these production illustrations."

E. L. Reynolds, a superintendent—"Present acceleration of production would make it virtually impossible to use the old type of production drawings while inducting and training new men. With our new production illustrations we can start a new and comparatively untrained man on a specialized job almost immediately."

Ruel Short is a fuselage assembly line worker who has been with the company only three months. Prior to that he was a salesman for a wholesale grocery concern. He had a natural background of mechanical aptitude, but no actual aviation training. His comment was—"I don't know how I could have gotten along without them."

Margaret Walker, who had worked on electrical aircraft motors but had had no experience in the type of work she is now doing, and Virginia Rhoades, who works at the same assembly bench with Miss Walker and had been a sales girl in a store, both say they found production illustrations invaluable in learning their new jobs.

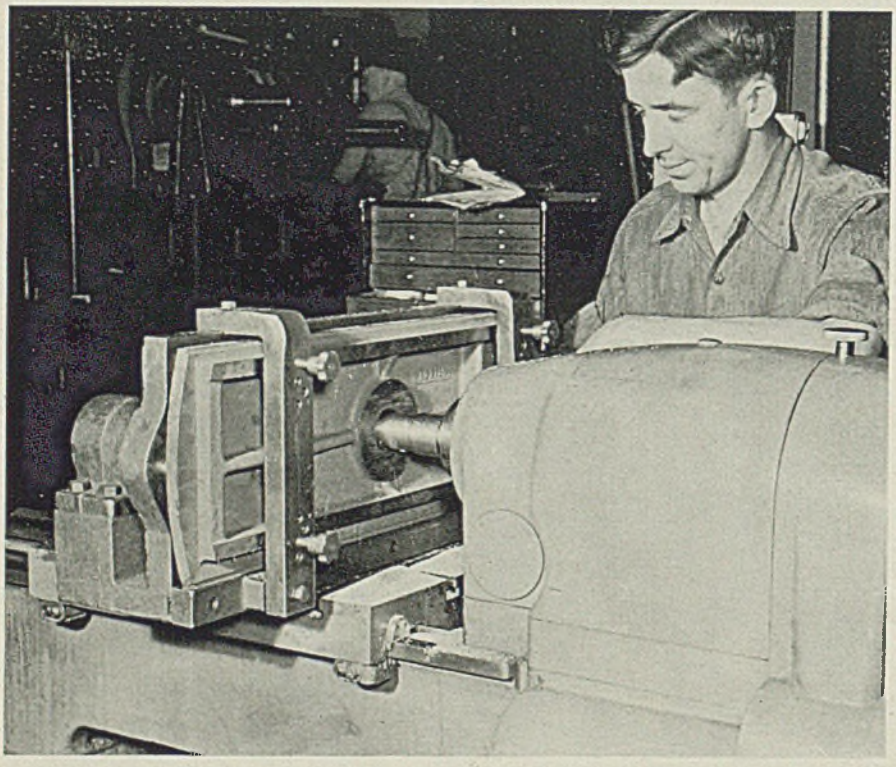
Throughout the Douglas plants it is evident, judging by the number of assemblers "caught in the act" of checking with a sketch some phase of work in progress, that production illustrations are saving time, speeding the work and helping to eliminate error. Many of those workmen had no previous technical training. Most of them could not have read an engineering drawing. They were just "average Americans", technically unskilled but doing jobs vital to the war effort in a skillful way and without long and expensive training. They had come from farms, shops, offices and industries curtailed by priorities. Now they are aircraftsmen playing a vital role in the drive to victory.

Because of a new idea, a new technique that is applicable in almost all types of industries using assembly lines to put war goods together, they have been hastily assembled, quickly taught and are "in there pitching" months ahead of schedule.

"Does this new technique apply in other industries?" you might well ask. The answer is an emphatic "yes"—so those now adapting it assert. And the surface has not been scratched, yet. There seems no reason to doubt that the manufacturers of tanks, machine guns, radios, ships, sound detectors, search lights and the thousand and one other war needs can save time, can more quickly put new and untrained help to work on a productive basis and can cut costs by showing their workmen how to do their new jobs with pictures.

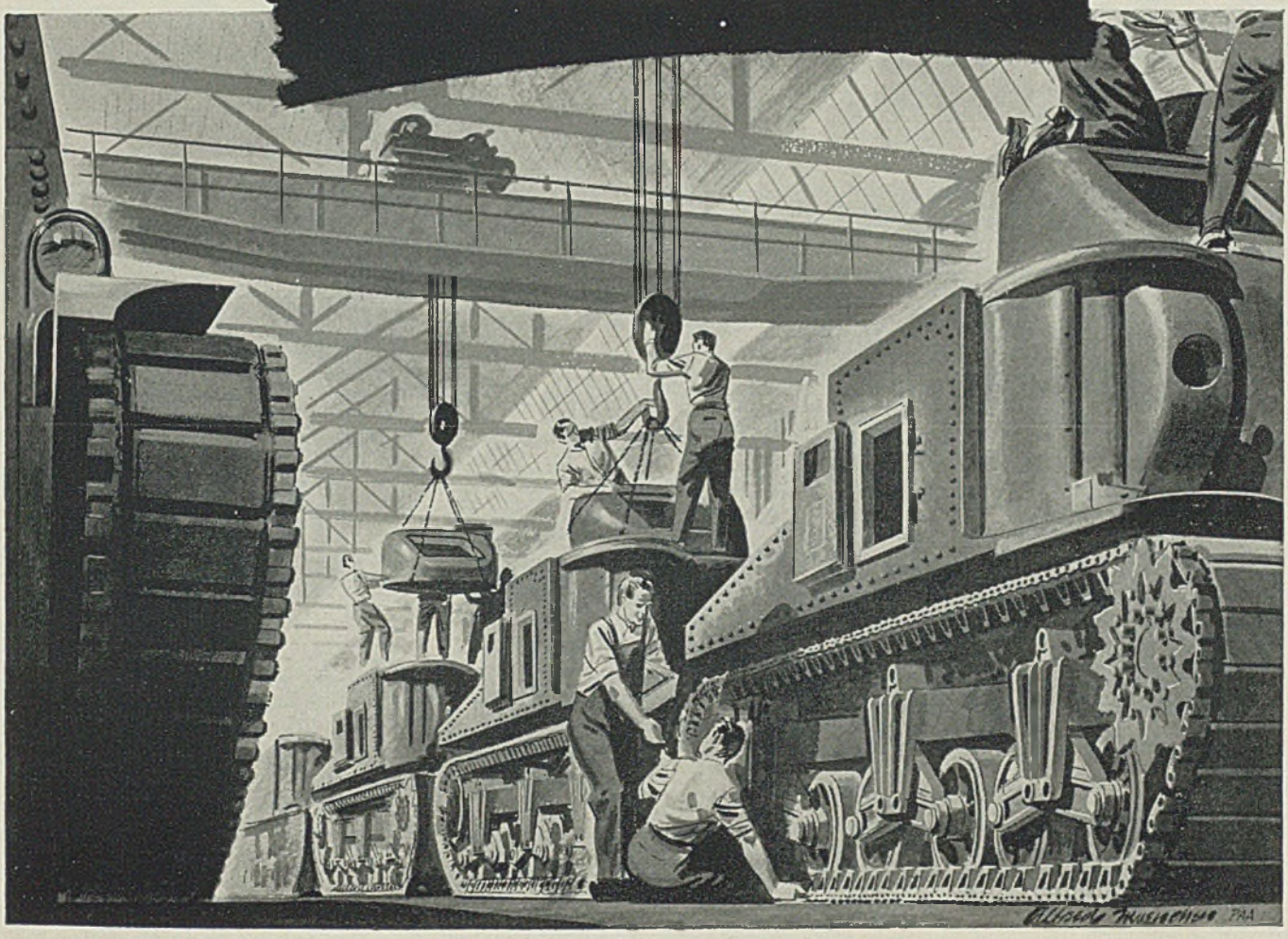
All of this began several years ago, and the movement since has been spreading rapidly. Into the ranks of those

Boring with a Tool-Room Lathe



BY REVERSING usual lathe practice on its 10-inch tool lathes, Monarch Machine Tool Co., Sidney, O., discovered it could bore various machine parts at high speed. Instead of the work, the tool revolves while the work is held stationary. To do this, a platen carriage which accepts fixtures for holding various work is provided for the lathe instead of the regular conventional carriage. Unit in action here is boring the swivel pin bearing hole of a taper attachment slide. Length of this slide ordinarily would require a lathe of large capacity. This setup is said to provide exactly the correct surface cutting speed for the material. Moreover, hand reaming is eliminated entirely

to win this war . . .



takes big-scale production

. . . and the speed and precision of **Gas!**

When it comes to materials, the demands of war are far more exacting than those of peace. The choice of Gas for speed of production and precision of manufacture is a tribute to this modern fuel. If ever a fuel were called upon for the utmost in speed, flexibility, controllability, and economy, it is in the building of armaments—planes, tanks, guns, ships, bombs. These call for extreme precision in heating, often as many as 15 different heat treatments, to assure the special characteristics which these munitions need.

We of the Gas industry are proud of the role of Gas in speeding war production. With all our resources, engineering knowledge and research results, we are engaged in an all-out effort to aid American industry in winning the war.

Some of the specialized knowledge on Gas-fired heating applications which we have acquired over the past 15 or 20 years may be of help to you. Call your Gas company for full information.

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making up new production illustrations has gone a steadily increasing number of specially trained men and women. Some personnel with artistic inclinations were drawn from existing engineering staffs and, after short training, were assigned to the new department. Others were obtained from the Production Illustrations Department, Industrial Design Division, of the Art Center School in Los Angeles.

George Tharratt, being a rare combination of an engineer by training and experience and an artist by native talent, realized from the start that those who were to draw production illustrations would need both backgrounds, with emphasis on the engineering. The engineering talent was not too difficult to find, but to add the artist's ability to translate engineering drawings into simple and easily understood working sketches for the layman would require a new teaching technique.

During three years of experience in teaching the method in classes set up for the purpose at two nearby schools, Mr. Tharratt developed an instruction technique that was further polished with the help of Edward A. Adams, director of the Art Center School. Courses were opened at the school that would give engineers enough understanding of the art side in a reasonably short time and industrial artists enough of the engineering phase to equip them for the work. A steady flow of students from these courses to production illustrations departments has thoroughly tested the teaching technique and definitely proved it to be adequate.

Instruction being given by the school, with practical men lent by industry as instructors under the sponsorship of the United States government, includes teaching of the highly specialized vocabulary of this new sketching technique. The work is, in every sense, practical and contemporary. In drawing these "schematic perspectives" the engineer-artist shows his three dimensions by means of simple shading and other devices developed especially for the purpose.

Under the sponsorship of the Training-Within-Industry Division of the War Production Board, with the approval of TWI chairman, C. R. Dooley, a nation-wide plan has been inaugurated to supply all war industries with men competent to head production illustrations departments and, in turn, to train their own staffs. In some instances men will be furnished to industries requesting them from the lists of those in training at the school. In other cases industries will be urged to send men from their own staffs to the school for brief courses that will cover those phases of the new technique with which they are unfamiliar. In all cases, regardless of the source from which such men are drawn by industry, they will be capable of training the men who will assist them in such a department.

Costs of the training are being paid by the Federal government, just as it is paying the cost of training other workers for war industries in trade schools throughout the nation to speed the war production program and to clear the labor shortage bottleneck.

Executives of war industries desiring information about this method can obtain it by contacting the Training-Within-Industry Department of the War Production Board, Washington, D. C. All inquiries will be handled by the TWI, which will send a competent representative to the inquiring plant to study its possible use of the method. If the on-the-grounds investigation discloses a use for the system, arrangements will be made to furnish a trained engineer-artist or to train a member of the firm's existing staff to help install such a department.

Production illustrations are believed to be one sound and practical answer to the war production labor shortage; they reduce assembly time; cut costs, reduce error; make change-over easier; help to develop new methods; visualize ideas to and from the engineering department; give service manuals a universal language; and will have pretty much these same uses when peacetime production is resumed. The department itself is a connecting link between ideas and production, a subdivision of engineering.

The method can be applied in all types of industries using a production line assembly system. Use of it is available to industry without cost. And the Training-Within-Industry Department of the War Production Board urges its widespread adoption by all war production industries where technique can be adapted.

Substitutes Save Metals In Making Convectors

To conserve critical metals, the Trane Co., La Crosse, Wis., has perfected a new nonmetallic cabinet convector to be used in place of all-metallic convectors and radiators. Except for the screws, these cabinets are entirely of nonmetallic materials.

Side and top panels are fabricated from rigid fiber board. Supporting members at the corners are of hard wood. The element of the convectors is of steel fins and tubes. Small amount of metal used is equivalent to one-fifth of that used in the ordinary radiator.

Four aerial bombs or sixty-eight 0.30-caliber rifles can be manufactured from the metal saved by every five nonmetallic cabinet convectors used in place of conventional radiation, it is estimated.

Machine Tool Textbook Covers Lubrication

An important contribution toward success of the war production program is represented by a textbook just published by the Cincinnati Milling Machine Co. and Cincinnati Grinders Incorporated Oakley, Cincinnati, O. This 56-page, 8½ x 11-inch book—entitled *Lubrication of Cincinnati Milling, Grinding, Broaching, and Lapping Machines*—covers the subject minutely, but without resorting to "heavy" text to accomplish this end.

It is accomplished by a series of ingenious 2-page spreads laid out crosswise in the book. When the book is opened with left hand page up, the spread covering some one particular machine is in reference position.

The left hand page—now the upper page—carries outline drawings of the machine, as many views being presented as are necessary to show every lubrication point. These points are positively located by numbered arrows on the plates.

The right hand page—now the bottom page—carries a simple table with the following heads: "Parts Lubricated"; "Station Numbers" (This of course refers to the "arrow numbers" referred to in the preceding paragraph); "Oil Specifications" (According to the Cincinnati Milling Machine Co. system of specification numbers); "Method of Filling"; "When to Oil, or to Change Oil"; and "Quantity Required in Gallons" (This applies primarily to reservoirs).

A typical line in a table dealing with automatic milling machines reads, following the order of headings just given:

All parts in column automatic lubrication; 6 (This refers to arrow on drawing pointing to filling door in column); P-31 (Reference to supplementary table in back of book reveals that this symbol oil, viscosity 190 to 210 seconds Saybolt at 100 degrees Fahr.); By hand pump; Every six months; 3 gallons.

The last paragraph in the preface to this book deserves quotation here because it "hits the nail right on the head" as far as this phase of servicing industrial machinery of all kinds is concerned —especially in large plants. This paragraph reads as follows:

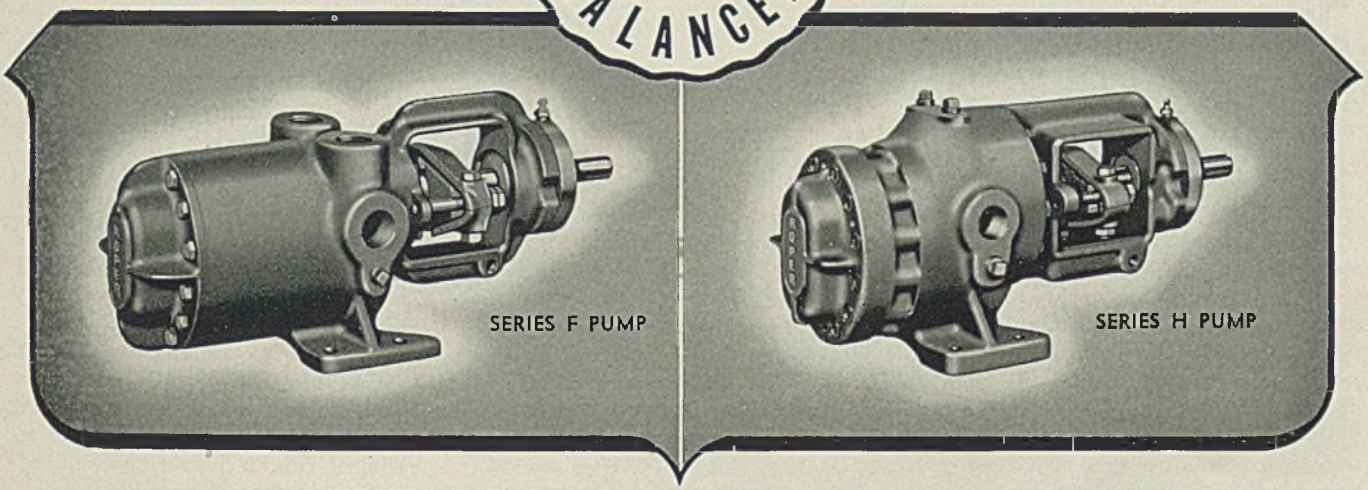
"Assurance of proper lubrication can be attained through establishment of a planned lubrication control system, centralizing in a separate department the responsibility of lubricating all machines and relieving the machine operator of this duty.

Copies of this book are available free of charge to accredited plant engineers and maintenance men who write for it on company letterheads.

ROPER Rotary PUMPS

HYDRAULICALLY BALANCED

Dependable *Since 1857*

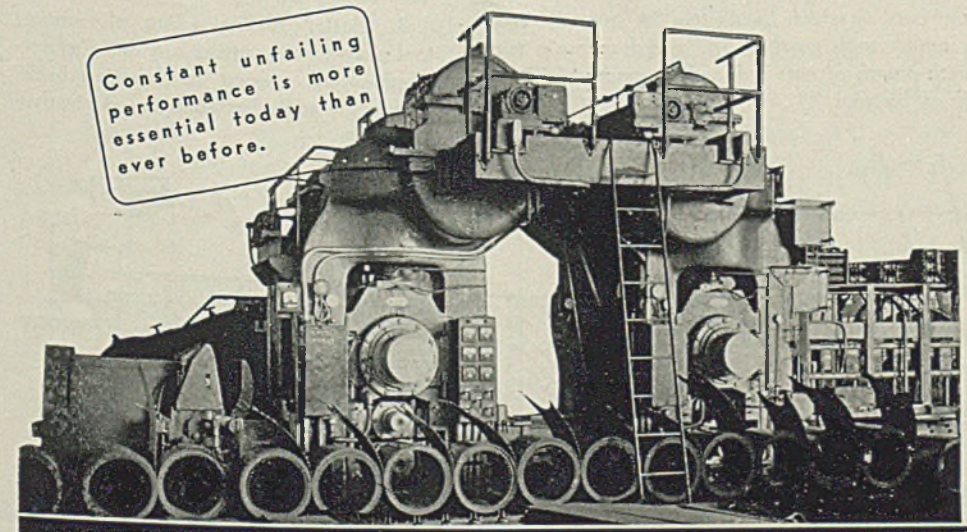


The Preference of Steel Mill Engineers

Roper Rotary Pumps are used in most of the steel mills of America for just one reason . . . they do a better job!

For many years steel mills throughout the country have depended upon Roper Pumps for giant gear drives; stand, rack and manipulator bearings; reversing tables; table rollers; moving parts of screw down mechanisms . . . all of which require the safest and surest form of constant lubrication under pressure without risk of shutdown.

Roper Pumps, when installed with space saving direct drives, become integral parts of the machinery they service. With only two moving parts they produce the very maximum of mechanical and volumetric efficiency as proved by actual performance records. From the hundreds of standard models available you can select what is practically a custom-built pump to handle your particular job.



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It contains a summary and a digest of factual information concerning pumps and pumping problems.

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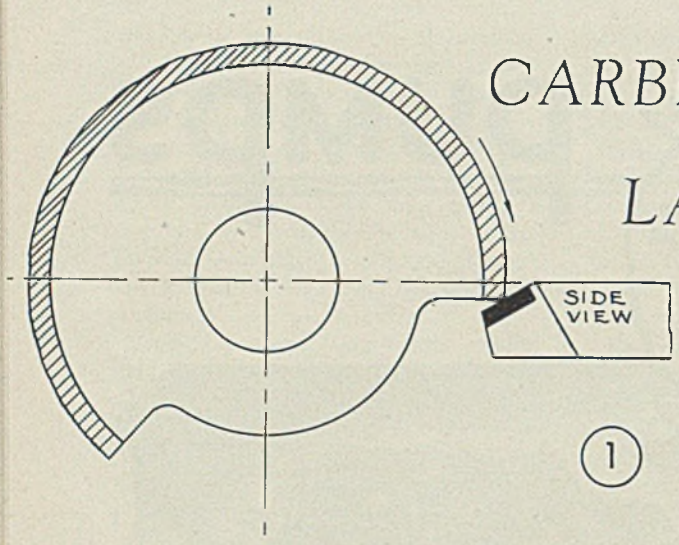
CARBIDE TOOLING OF LARGE MACHINES

.... Relieves Them Of "Critical" Status



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By FRED W. LUCHT
Engineer
Carboloy Co. Inc.
Detroit

UNTIL recently there was little interest in the idea of application of carbide tools to large machines such as boring mills, large vertical turret lathes and big engine lathes. These large machines rarely were run on a continuous basis, and many of them were of older types, designed for relatively low speed cutting—25 to 30 feet per minute. Usually they were insufficiently powered to use carbides effectively, and some of them lacked the rigidity required.

Today the situation is quite different. With many of these large machines on the "critical" list, production through their use has had to be stepped up to meet wartime demands. Therefore it is not surprising that there now is sharp increase in use of carbide tools in connection with them.

Fundamentally there is no reason why carbide tools cannot be applied successfully to most large machines, at least those of fairly recent vintage which possess necessary rigidity and are powered and geared for higher cutting speeds.

Carbide tools originally were used primarily on cast iron and nonferrous machining operations. Even on these materials they only were recommended for continuous cuts. It generally was believed that they lacked sufficient strength to handle interrupted cuts. This belief seemed justified because when the early forms of carbide tools were tried on interrupted cuts, tool breakage often occurred. Other common reasons for breakage of early carbide tools were: Sand in castings; big run-outs; and heavy scale.

Today this picture is quite different. Modern carbide tools are demonstrating that they now are able to take "right in their stride" the entire gamut of interrupted cuts, including those in various hard and tough varieties of steel. These tools are functioning effectively on jobs ranging all the way from a few thousandths of an inch deep on precision boring machine work to cuts one inch deep on large tank parts.

Among the factors which have contributed to this broadened effectiveness of carbide tools on large work in large machine tools are:

1. Vastly increased knowledge of proper speeds and feeds as well as improved clamping fixtures and more rigid tool holders.

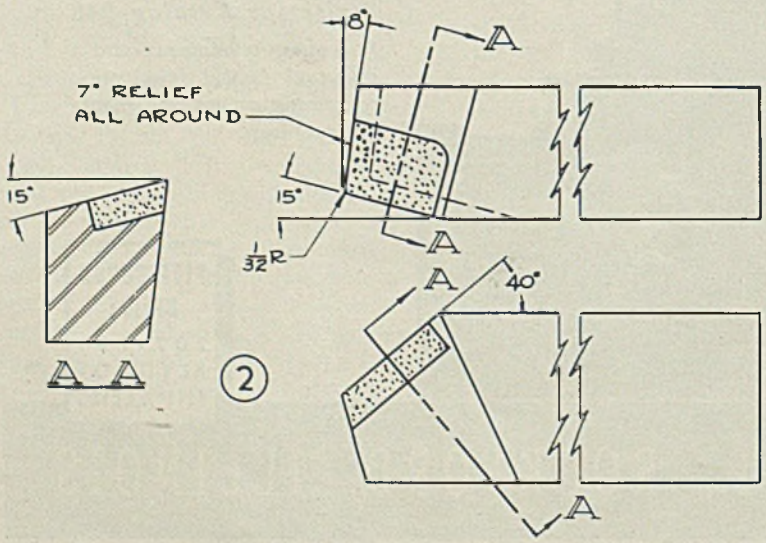
2. Better judgment in determination of shank and tip sizes required for "standing up" to heavy cuts.

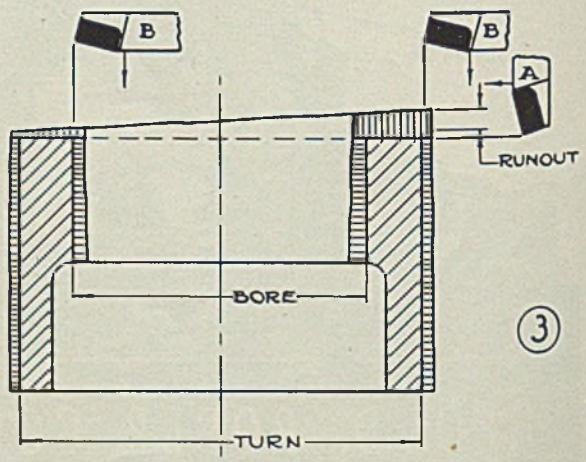
3. Better understanding of correct tool shapes and cutting angles. For example, development of negative back rake angle tools has contributed greatly.

Fig. 1—This shear-cutting carbide tool is designed especially for machining large work involving interrupted cuts, impact load being decreased and its concentration kept away from point of the tool

Fig. 2—Extreme negative rake of this shear-cutting carbide tool makes it very effective for roughing out large diameters. Not recommended for finish cuts, however, because machined surface is liable to be marred by chip curling down upon it

Fig. 3—Example of "planned" sequence of cuts, in which facing tool "A" removes scale and trues up end of casting, following which tools marked "B" simultaneously turn and bore—starting in clean metal and with length of cuts reduced by amount of "run-out" removed by tool "A"





In some instances negative rakes successfully have been carried to what once would have seemed extreme degrees in order to achieve shear cutting, as in the cases shown by Figs. 1 and 2. This technique has contributed tremendously toward giving carbide tools the ability to handle interrupted cuts on large work. As can be seen in the illustration, impact following the interruption is minimized by gradual entry of the tool into the cut, and with negative back rake initial load following interruption falls on the body instead of on the nose of the tool.

4. General installation of centralized departments devoted to resharpening and reconditioning single point tools as well as reamers, drills and other end-cutting tools. This assures correct grinding of carbide tools by specially trained experts. It saves valuable time and costly tools which inevitably are lost when machine operators take time out to grind their own cutting tools in the old-fashioned way.

Another factor responsible for increased use of carbide tools on large machines is the fact that today more shops have facilities to make up their own carbide tools by tipping shanks with lower priced carbide tips now available. Such facilities go far toward avoiding delays and expediting tool salvage.

Only recently has there been a sufficient interest in application of carbides to large machines to cause users and tool manufacturers to tackle the problems with necessary vigor to bring about their solution.

Advantages of properly applied carbide tools on large machines can be summarized as follows:

1. Increase of cutting speed permits a reduction in feed, insuring better finish, but without reduction in amount of metal removed in a given time. Since higher cutting speeds go hand in hand with maximum efficiency and output, machines of fairly recent vintage should be capable of running at speeds two to four times as fast as those customary with ordinary tools.

2. Use of lighter feeds permits use of lighter fixtures, which are simpler in design, lower in cost and quicker to build. Best results under test cuts have been obtained when the feeds have been held below 0.030-inch. These lighter feeds in practically every instances have been more than offset by the higher cutting speeds employed.

3. With these lighter fixtures, light, thin-walled parts can be machined quickly and more effectively. Since they do not have to be locked unduly tight in chucks or fixtures, distortion is avoided.

4. Carbide tools usually provide longer tool life per grind, reducing down-time and set-up time. However, shanks must be amply large to offset the effect

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ROUND WIRE TO SPECIFICATIONS

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SHAPED WIRE FOR HOSE OR CABLE ARMOR

STEEL FOR CABLE ARMOR WIRE must be tough enough to withstand severe impact stresses—yet low in tensile strength, to wrap tightly and hug the cable.

This is but one of a thousand tough specifications for round, flat and shaped wires that is being called for on war orders—and being *met* at Roebling. It requires the kind of custom steel-making that is right down our alley . . . that we have the experience, skill and facilities to tackle . . . and deliver on schedule.

If you require exacting steel analyses, dimensions within close limits, special finishes . . . time is on your side when you call in Roebling to meet your standards. Prompt action on war orders.

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of unavoidable tool overhang, which frequently is considerable on large boring mills. Charts are available for selecting correct shank and tip proportions.

5. Carbide tools permit ready machining of harder materials, including armor plate castings, forgings and heat treated alloy steels of 300 to 500 brinell.

6. Operators turn out more work with less effort. They do not have to grind and replace tools as often, nor check as often to guard against changing dimensions due to tool wear. As emphasized previously, a centralized grinding department is an important factor in obtaining maximum performance of both machine and cutting tool.

In putting carbide tools to work on large machines we frequently find that advantages gained for exceeded results attributable to carbide tools alone. Altogether too many large machines are being operated according to antiquated practices handed down from year to year and even from decade to decade. Introduction of a "new" element, such as carbide tools, has permitted leads to a healthy shakeup and reorganization of machining practice in a manner which otherwise would be difficult to bring about.

Prime among shop practice improvements which thus are brought about are the following:

1. "Planned" cutting.
2. Adoption of tool-setting devices for quicker set-up.
3. Greater usage of machine dials as a check on cutting.

Planned cutting means nothing more than arranging the order of cuts to insure removal of stock in the most efficient manner. It is surprising how little deductive reasoning is applied to this question in many plants. An example of planned cutting is shown in Fig. 3—rough facing of the part before turning being the key operation. While primarily this is done to reduce excessive run-out of the work, it will be seen from the diagram that it also reduces travel both of turning and boring tools. Furthermore, it enables those tools to start their cuts in clean metal instead of through rough, hard scale. This causes them to hold size better and reduces floor to floor time because less time is consumed in replacing dull or broken tools. In some cases we have found it possible by planned cutting with carbide tools to reduce machining time by many hours. Cutting a 30-hour machining job down to 8 or 10 hours by such simple expedients, no longer is regarded as unusual.

Adoption of quicker methods of set-up is another expedient which can contribute materially to increased output. "Get rid of calipers" is a good slogan to adopt in this connection. Indicators, simple tool setting gages embodied in jig and fixtures, and more effective use of machine dials are factors which should be considered.

Checking the machine dial setting when changing tools provides a surprisingly accurate method of speeding tool resetting. Based on their experience with older, less accurate machines, many operators don't trust these dials. They should be made to appreciate that ground lead screws in conjunction with accurately divided and clearly marked dials are the rule on most of the newer machines, thereby changing this situation completely. Where chip interference does not prevent, another practical way to speed tool setting is to make use of an indicator permanently clamped to the cross-slide of the machine.

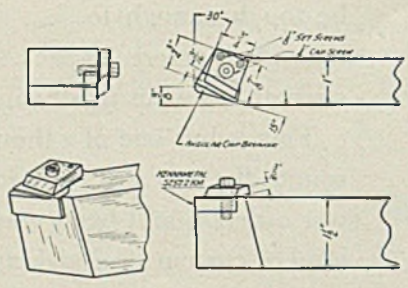
Substitutes Cast Iron In Unit Heaters

Cast iron heating sections have replaced those of aluminum in the Grid unit heater manufactured by D. J. Murray Mfg. Co., Wausau, Wis., to co-operate in the war effort.

The unit is engineered along the same lines as the former heater, constructed to withstand up to 250 pounds steam pressure. Use of cast iron is in accordance with a WPB permit.

Clamped-On Tool Tips Eliminate Strains

Shops making up their own carbide cutting tools can greatly simplify the job and at the same time be assured of strain-free tools by using a clamped-on tool, according to McKenna Metals Co., Latrobe, Pa. A simple design found satisfactory by the company is shown in the



accompanying sketch. Here a tool shank is being milled out, care being taken to get as flat a surface under the tip as possible, and a clamp attached. The SAE 1045 clamp is not used to break the chips as it would soon be eroded to destruction. Instead, a conventional chip breaker of angular shelf type is ground into the tool tip.

Any danger of brazing strains is eliminated entirely, and grinding is simplified since only the Kennametal, in this particular case, is in contact with the grinding wheel—no steel to load up and glaze the special silicon carbide grit. One such SAE 1045 shank, according to the company, will serve to mount about four successive tool tips before it becomes cut and battered badly, and a harder steel would probably last even longer.

As the tip is reground, it is moved forward and out under the clamp, shims being placed behind it. When the tip becomes too small for service in this tool, it can frequently be brazed into a smaller shank for lighter turning operations or boring.

The freedom from strains due to unequal expansion of tip and shank makes a great difference in tool life, particularly on "home-made tools" which are made under widely varying conditions. In one plant, it was found the use of clamped-on tips made it possible to operate for months without a single case of serious tip breakage.

Develops Substitute Belt for Farm Use

A new transmission belt using 90 per cent less rubber than ever before and adapted especially to agricultural use is being offered by Goodyear Tire & Rubber Co., Akron, O.

Known as Klingtite cord Hammermill belt, it is modeled closely after Goodyear's endless Compass cord belt, now used for industrial applications of transmission belting.

The new belt's flex life is said to be actually six times that of preceding types. In addition, it is actually endless, with no splice or "weak point"; approximately the same weight as the type of belt it replaces; has very little low stretch; offers snug wrap around small pulleys and is suitable for high speeds.

Practice on Wire Screen Diameters in Print

Printed copies of simplified practice recommendation R-147-42, "Wire Diameters for Mineral Aggregate Production Screens", are now ready for distribution, according to the Division of of Standards, Washington. These list the wire sizes recommended for the construction of mineral aggregate production screens of various sizes of clear square opening.

As a result of a recent review of the recommendation, wire diameters for screens with clear square openings of 3¼ and 4 inches were added to the schedule. This adds only one new wire diameter, i.e., 1-inch, to those already listed.

Copies of R147-42 may be obtained from the superintendent of documents, Government Printing Office, for 5 cents each.

Uses Special Steel To Conserve Nickel

Twenty thousand pounds of nickel—enough to make armor-plate for 55 medium tanks—will be conserved this year by the Westinghouse Electric & Mfg. Co. through substitution of Hipersil steel for a nickel alloy in war-needed electronic equipment.

Developed originally for electric transformers, the steel is replacing a nickel alloy in the manufacture of Ignitrons, devices for converting alternating current to direct current for manufacturing two vital war metals—aluminum and magnesium. Ignitrons also supply direct current for electric locomotives, steel mills, street cars, subway cars, printing plants and for spot welding.

In former years one part of the Ignitron equipment—the reactor—was made of an alloy containing about 50 per cent nickel. When Hipersil was tried, it performed as efficiently as the nickel alloy and turned out to be more satisfactory under changing temperature conditions.

The magnetic properties of the steel are not materially affected by temperature changes, which range in the reactors from 70 to 200 degrees Fahr. A special silicon steel, it is produced by certain melting, heat treatment and rolling techniques that rearrange its crystals and improve its magnetic properties.

The process changes the crystals from random patterns to oriented or orderly structures, with the result the steel carries one-third more magnetic flux or magnetism than ordinary steel.

New Plastic Pipe To Conserve Metals

A plastic pipe, developed to free critical metals, is announced by Dow Chemical Co., Midland, Mich. It is said to be made in the same dimensions as extra-strong steel pipe of 2-inch outside diameter or less. It also is resistant to extreme moisture, chemicals and solvents.

Saran, a new thermocouple resin, is used to form the pipe. The base resin is odorless, tasteless and nontoxic. The plastic, it is reported, does not burn, and its toughness and abrasion resistance are of a high order.

The pipe is produced in smooth, round, accurately sized lengths having dimensions identical with those of iron pipe. It can be readily welded, heated and bent, and can be cut with a wood or hack saw and threaded with ordinary iron pipe dies. Its weight is less than that of comparable sizes of iron pipe.

Fittings for the pipe, except standard flanges, are not available.

Wyckoff ENTERS THE
THIRD YEAR OF VICTORY PRODUCTION

●Nearly three years ago . . . even before Lend-Lease was a reality . . . Wyckoff Drawn Steels were supplying much needed precision and accuracy in large volume to the defenders of Democracy.

Today 100% of Wyckoff's capacity is serving the United Nations' War Production Program . . . producing uniform quality, fast-working, cold drawn steels . . . the result of more than 25 years of "know-how" and nearly three years of military specification experience.

The All Navy "E" Burgee, proudly flying at both Wyckoff plants, is a constant reminder to us of still greater goals ahead!

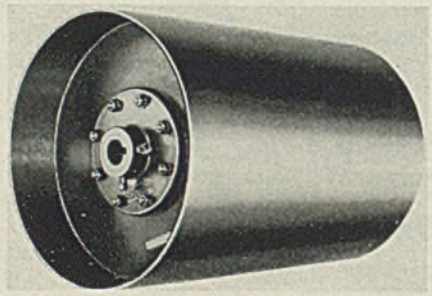
WYCKOFF DRAWN STEEL COMPANY
FIRST NATIONAL BANK BLDG., PITTSBURGH, PA.
3200 SOUTH KEDZIE AVENUE, CHICAGO, ILL.

Manufacturers of Carbon and Alloy Steels . . . Turned and Polished Shafting . . . Turned and Ground Shafting . . . Wide Flats up to 12" x 2"

INDUSTRIAL EQUIPMENT

Conveyor Pulley

American Pulley Co., 4200 Wissahickon avenue, Philadelphia, announces a new type N tight-end solid conveyor pulley for belt conveyors. It can be



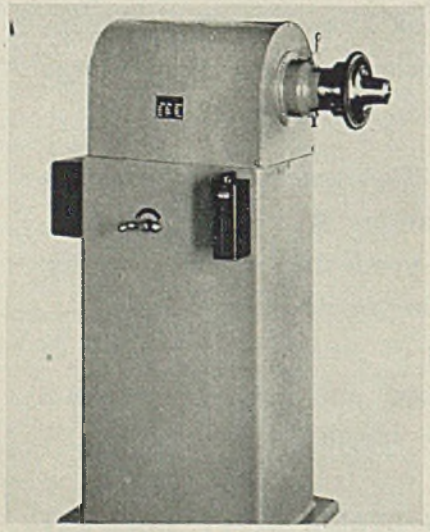
kept clean easily as no spilled materials or dust or water can accumulate inside. Unit is of light-weight rolled steel. It is equipped with interchangeable hub, and is offered in diameters 6 to 36 inches.

Finishing Lathe

Schauer Machine Co., 2070 Reading road, Cincinnati, is offering a new Ideal speed lathe especially designed for finishing, burring, filing, lapping or polishing operations. It is capable of increasing the output of finished screw machined parts up to 1⅜ inches in diameter.

On the unit, a Sjogren chuck operates a spring collet which is quickly adjusted to the size of the work by a hand wheel mounted on the chuck.

The machine is similar to the com-

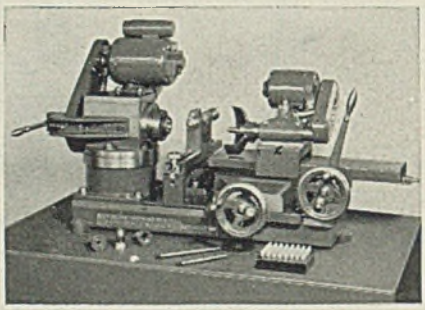


pany's standard lathe. Motor speeds as low as 20 revolutions per minute ranging up to 4000 revolutions per minute are available on it. The speeds are in ratio of 6:1 for single speed motors and 12:1 for 2-speed motors. Variation in spindle speeds is obtained by movement of a variable pitch pulley controlled by a ball crank.

Standard size pulleys are used and connection between driving and driven parts is replaceable by standard length V belts. Tension adjustment for both belts compensate for wear and stretch. The motor is spring mounted in the base of the pedestal and controls automatically belt tension.

Internal Grinder

Abrasive Machine Tool Co., East Providence, R. I., announces a new No. IC internal grinder suitable for handling such work required in the manufacture of bullets and cartridges. It will grind holes up to 12 inches di-



ameter, has a longitudinal travel of 8 inches and spindle cross feed of 3½ inches.

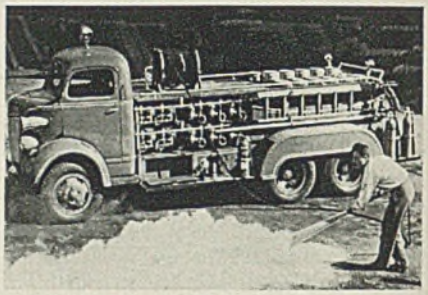
Cross feed on the machine is provided by a hand wheel graduated 0.001-inch. Hand wheel for longitudinal feed also is graduated 0.001-inch positive stop being equipped with micrometer adjustment.

Crash Trucks

Walter Kidde & Co., 122 East Forty-second street, New York, announces a new all purpose crash truck for use as protective equipment around hangars and test fields of aircraft manufacturers. Equipped with carbon dioxide, foam and water, the new fire truck is able to cope with any kind of blaze from ordinary rubbish fires to those taking place in oil, gasoline, flammable paints and electrical equipment.

Extinguishing apparatus on this unit include ten 100-pound cylinders of carbon dioxide under pressure to 850 pounds per square inch at 76 degrees, a 200-gallon per minute water pump with suction hoses for use with outside supply and a self-contained water tank holding 250 gallons; and a foam generator and twelve 50-pound pails of foam powder.

The carbon dioxide cylinders are connected to a 150-foot hose mounted on a trunion type wheel and equipped with



horn, nozzle and shut-off valve assembly. The water pump is driven from the truck transmission and is equipped with 400 feet of hose in 50-foot lengths. The foam generator is mounted on the running board and connected to the pump with a flexible swivel connection permitting operation on or removed from the truck. Additional equipment includes two portable carbon dioxide units, two antifreeze units, axes, crow bars, wrecking bars, searchlights and extension ladders. The truck is built on a Marmon Harrington chassis equipped with 4-wheel drive and powered with a Ford V-8 engine.

Air Raid Equipment

Specialties Mfg. Co. Inc., 35 Farrand street, Bloomfield, N. J., announces two new pieces of equipment for air raid

work—an air raid stirrup pump barrel and air raid sand barrel truck. The former, illustrated here, consists of a 20-

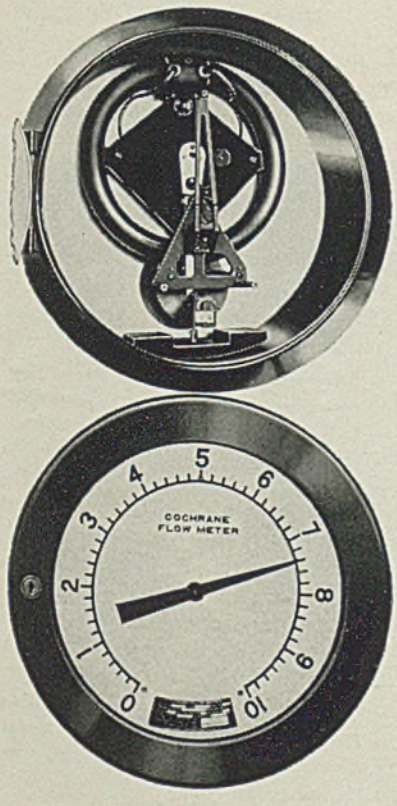
gallon barrel, mounted on wooden wheels so it can be trundled to the place of use. Two handles also are incorporated so two people can carry it up stairs.

Top of the barrel is fitted with a hinged cover to enable charging. A stirrup pump is fitted into the top of the barrel and to this pump there is attached a 12-foot hose with an adjustable spray nozzle. An axe attached to the side of the barrel completes the equipment.

The sand barrel truck, in appearance, is similar to the extinguisher barrel, except that sand instead of water is stored in the barrel. It has a capacity of approximately 2½ cubic feet. It also has handles to facilitate carrying. A long-handled shovel is provided for required use, and an axe is included for cutting through interferences. Like the stirrup pump barrel the sand barrel is mounted on wheels and is painted a bright yellow, or with luminous paint.

Flow Meter

Cochrane Corp., Seventeenth street and Allegheny, Philadelphia, has introduced a high pressure flow meter for measuring flow in high pressure process operations in the neighborhood of 5000 pounds per square inch. It features



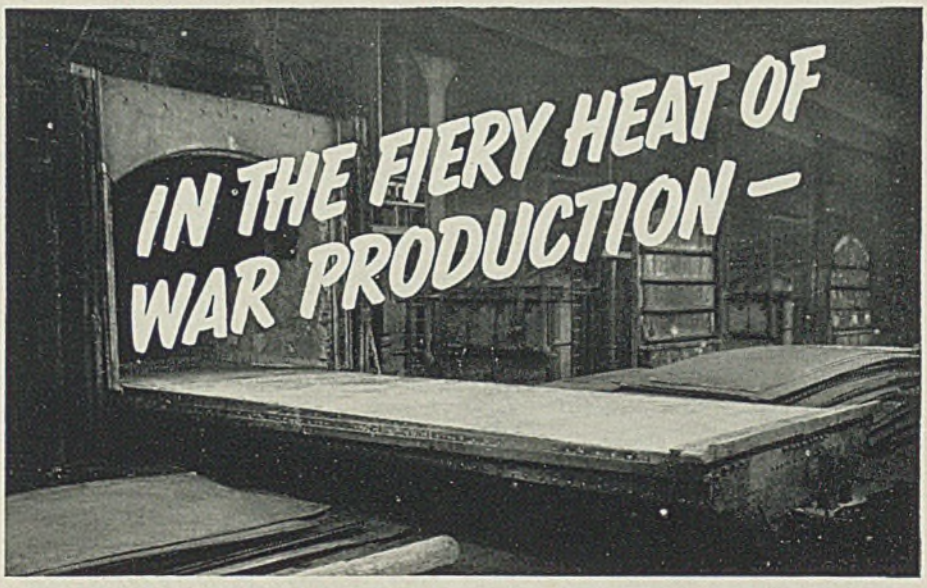
accuracy, freedom for maintenance, and complete safety secured by a special adaptation of the ring balance (tilting U-tube).

The mercury sealed manometer of the meter is a stainless steel ring 15 inches in diameter. It is balanced on knife edges at its geometric center. The partition at the top of the ring is of solid stainless steel block drilled for the pressure connections. Nickel tubing connects the top of the ring to the center of rotation where they join the free ends of the twin 6-inch nickel torsion tubes. The outboard ends of the torsion tubes are anchored and to these the pressure lines from the primary elements are connected.

By this design, the ring tilts 10 degrees for the full differential range measurement which may be between 4 and 9 inches of mercury depending on the cam weight supplied. The cam extracts the square root relationship so as to express the flow directly in uniform increments on the 36-inch indicating scale which may also be combined with an integrator and/or 12-inch recording chart feature.

Welding Rod

Alloy Rods Co., York, Pa., announces the development of a giant new arc welding electrode that is said to be the largest yet produced. It is ½-inch in diameter, 28 inches long. Designed expressly for welding armor plate on tanks, it is claimed to increase welding production four times because its weld metal deposition rate is four times conventional speeds. Such a size of rod becomes



Refractory Concrete made with LUMNITE is helping industry pour out a continuous stream of vital war materials

IN THE furnaces, ovens and kilns of industry, Refractory Concrete, made with LUMNITE, confines and saves the heat that forges the instruments of war. In furnace walls, linings, and arches . . . in the arches of annealers and stress-relieving furnaces . . . for the doors of foundry ovens . . . for the tops of tunnel kiln cars . . . in riser-pipe linings, ducts and flues of coke plants—here are a few places to look for Refractory Concrete these days.

And what is Refractory Concrete doing in these jobs?

▶ It's saving time in making new refractory installations, because it's cold-setting, gains high strength in 24 hours of placing—without firing. It's saving time, money and man-hours by reducing need for maintenance and upkeep.

▶ Its jointless, one-piece construction reduces heat loss through walls, floors and roof arches. And prevents infiltration of outside air as well. Its smooth surface cuts down erosion and friction.

▶ Its adaptability is making easy the erection of furnace walls and arches of any thickness, size or shape . . . thus avoiding the limitation of standard size masonry units. It is enabling plants to precast many special shapes for future use, and avoid delivery delays in emergencies.

. . .

Our service forces are working to help industry make the most efficient use of this adaptable and versatile refractory material. We will be glad to give you all available information on application to your needs. Meanwhile, send for booklet, "LUMNITE for Refractory Concrete." The Atlas LUMNITE Cement Company (United States Steel Corporation Subsidiary), Dept.S, Chrysler Bldg., New York City.

LUMNITE FOR REFRACTORY CONCRETE

practicable by the use of a type of coating on the rod which permits using the rod down to the smallest stub without cracking.

In addition to the ½-inch size, these Armorarc Type B electrodes are available in 7/16, ⅜, 5/16, ¼, 3/16, 5/32 and ⅛-inch diameters. Sizes 5/16-inch and larger operate on both alternating direct current.

Furnace Door

Plibrico Jointless Firebrick Co., 1800 Kingsbury street, Chicago, has placed on the market a new type of furnace access, inspection and clean-out door for boilers, incinerators,etc. It features a handle that locks the door so tightly that all infiltration of excess air around the door is eliminated.

Door handle operates on a cam and lever principle so that the further the handle is depressed, the tighter the door is forced against the frame. The door is lined at the factory with insulating refractory material. This reduces the weight of the door, protects the metal from the heat, and decreases the radiation of heat into the boiler room.

Door frame measures 27 x 24¾ inches. The lower edge of the frame is supported by 2 lugs. These help to line up the door, keeping it in position. Because of the Lock-Tite feature of the door, it cannot be used as an explosion door.

Pulley Oiler

Oil-Rite Corp., 3466 South Thirteenth street, Milwaukee, is offering a new wick type lubricator for use on loose pulleys, idler pulleys, clutches, eccentrics, and similar rotating machine parts. It is designed to deliver a constant regulated amount of filter oil to shaft or bearing while pulley is in operation.

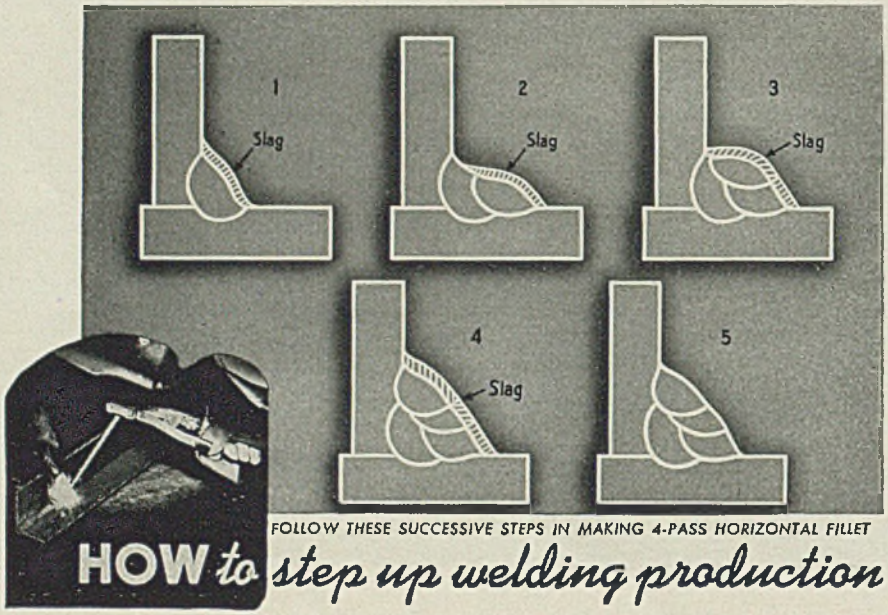
The lubricator consists of a simple glass oil reservoir, mounted on a hollow metal stem. Latter is sealed from the oil in the reservoir, except for two

small ports at the top. Inside the stem is a cylindrical felt wick, which extends through the pulley hub to rest directly on the shaft. A compression spring wrapped around the wick holds it firmly in position against the shaft. As the pulley rotates, and the lubricator with it, centrifugal force throws the oil against the top of the reservoir, and into the two ports in the stem. These admit oil to the wick, and conduct the oil directly to the face of the shaft.

Oil flow through the wick results partly from capillary attraction, partly from the suction caused by the drag of the wick on the shaft. The glass reservoir enables the reserve supply of oil to be always visible. Amount of oil to be delivered is regulated by means of a small plug which controls the area of the oil ports.

Transformers

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., announces two improved, type A current balancing auto transformer banks. These are "modernized" with clip terminal connections replacing the cable leads. The clip terminals make it possible for con-



FOLLOW THESE SUCCESSIVE STEPS IN MAKING 4-PASS HORIZONTAL FILLET

HOW to step up welding production

FOR years Metal & Thermit engineers have been advocating a fillet welding technique based on the use of higher currents, greater penetration at the root of the weld and, in multiple pass work, depositing beads from the bottom up to provide a horizontal shelf on which to deposit succeeding beads.

When it is realized that this method can, in many cases, double the welding speed, the importance of following this technique in today's war production is evident.

To get this increased production:

Hold electrode in a position perpendicular to the line of weld—and at an angle from 45° to 50° to horizontal plate and leaning in the direction of welding to form an angle up to 20° with the vertical.

Lay beads from bottom up. Use an intermittent weave with an occasional flick of the arc, so as to feather-edge the metal being deposited into that of the previous bead—thereby eliminating the valley between beads.

Leave the slag until each layer of beads has been completed. This saves cleaning time and speeds up the welding operation.

Besides greatly increasing production speed, this method of fillet welding will reduce the amount of electrode used per foot of weld and substantially lower welding costs.

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

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

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

MUREX
ARC WELDING ELECTRODES

nection to be made to the customer's leads without removal of any parts from the transformer.

Instead of cast iron, pressed steel is used for the case of the unit. The mounting plate is arranged for flat surface mounting or pipe frame mounting by means of U-bolts. Units are offered in ratings of 50 and 100 volt-amperes with a nominal ampere ratio of 10.8/5 to 5/5.

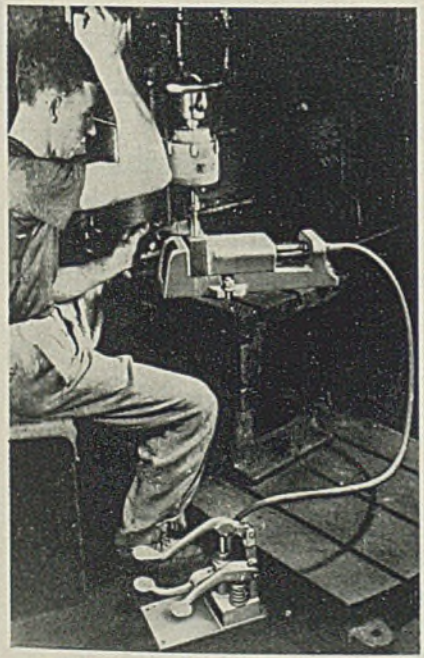
Acetylene Torch

Gas Gun Co. Inc., Salem, Oreg., has developed a new self-firing self-extinguishing automatic acetylene torch which is said to be suitable in shipbuilding and airplane plants. It also can be used in sheet metal, battery, refrigerating and plumbing shops, as well as soldering, brazing and burning plants.

The device is 6½ inches long, 5½ inches in height and weighs 20 ounces. It is designed along lines of an automatic pistol—operating like a gun. Pulling of the trigger ignites the torch working a steel and flint mechanism within the gas mixing chamber, and in reverse, releasing pressure on the trigger automatically extinguishes the flame.

Hydraulic Drill Vise

Studebaker Machine Co., 9 South Clinton street, Chicago, announces a new hydraulic drilvise which closes and opens



automatically for use by tool and die makers, machinists and machine operators. It is designed for holding work on the table of all types of drill presses, planers, shapers, milling machines, surface grinders, lathes, cut-off saws and other machines.

Entirely foot controlled and hydraulically operated, the tool permits the use of both hands in the operation, set-up and removal of work from the machine on which it is mounted. The unit exerts in excess of 10,000 pounds per square inch pressure between the jaws.

Self-sufficient, requiring no outside power or air supply, the unit consists of a conventially-shaped drill press vise (without usual screw or handle) and connected to it by a 6-foot length of flexible rubber tubing is a hydraulic foot control base.

Parts are portable. In operation, work is placed between open jaws of the vise, the operator moving the rear jaw toward the stationary front jaw by depressing with one stroke middle pedal of the foot control. This moves the rear jaw against the work exerting amount of pressure to only grip the work. The right or booster pedal moves the jaw a maximum of 3/16-inch for each downward stroke of the foot and exerts a maximum non-slipping pressure of 10,000 pounds per square inch. To release work, the left pedal is depressed. Tightening and releasing operations are done in 5 to 10 seconds. Jaw plates of the unit held by two 1¼-inch 20-thread machine screws and plates can be removed easily or replaced with special jaw faces.

24 YEARS EXPERIENCE IN VOLUME PRODUCTION OF AUTOMOTIVE PARTS

available on

Subcontract or Co-Contract basis

Can you use these facilities?

—A modern 5 acre plant, only 4 years old, completely equipped for immediate volume production of any or all of the items listed below.

—A force of engineers, production men and craftsmen which, at peak volume, totals 800—all men trained for years in meeting the exacting demands and volume requirements of the automobile industry.

For 24 years the American Metal Products Company has been a volume producer of parts and equipment for the automobile, truck and allied industries. Due to curtailed automobile production, the complete facilities of American Metal Products Company—plant, equipment and manpower—are available for immediate volume production, on a subcontract or co-contract basis, on any or all of the items listed here.

For full details as to how we can fit into your production requirements, write, wire or phone

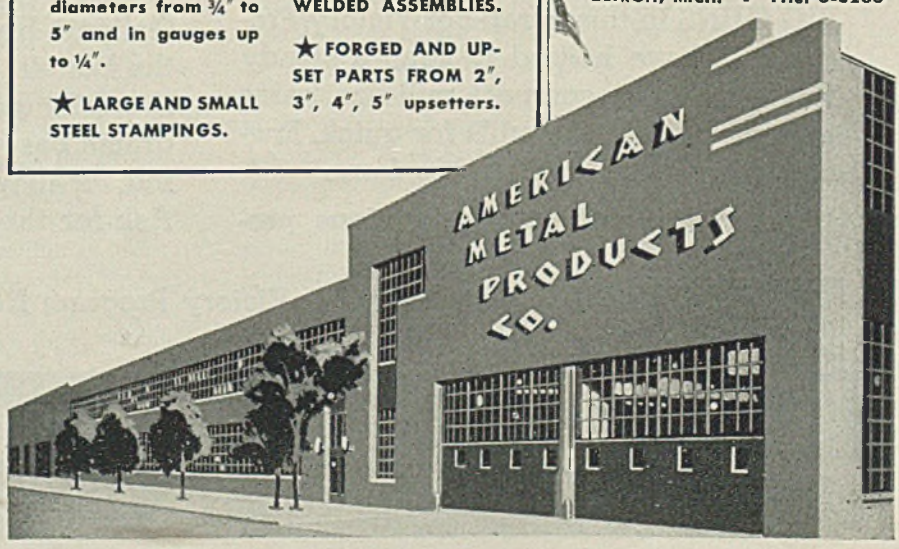
★ WELDED STEEL TUBES AND TUBING in diameters from ¾" to 5" and in gauges up to ¼".

★ LARGE AND SMALL STEEL STAMPINGS.

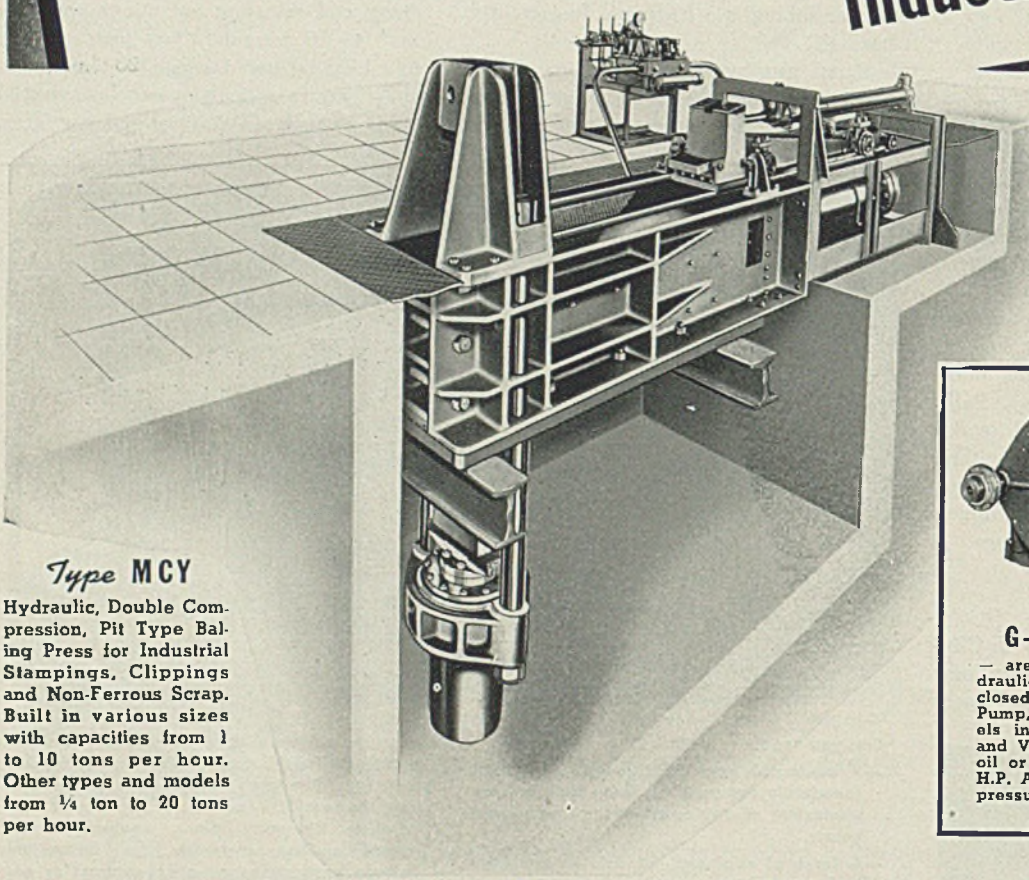
★ FABRICATED STEEL TUBULAR PARTS AND WELDED ASSEMBLIES.

★ FORGED AND UPSET PARTS FROM 2", 3", 4", 5" upsetters.

AMERICAN METAL PRODUCTS COMPANY
5959 Linsdale Avenue
DETROIT, MICH. • TYler 6-3200

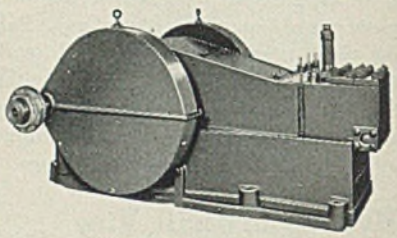


High Volume Scrap-Metal Salvage for the Metal Working Industries



Type **MCY**

Hydraulic, Double Compression, Pit Type Baling Press for Industrial Stampings, Clippings and Non-Ferrous Scrap. Built in various sizes with capacities from 1 to 10 tons per hour. Other types and models from ¼ ton to 20 tons per hour.



G-H HYDRAULIC PUMPS

— are the "power plants" for G-H Hydraulic Balers. Illustration shows Enclosed, Single Pressure Triplex Plunger Pump, Reciprocating Type. Other models include Horizontal Double-Pressure and Vertical Single Pressure Pumps for oil or water. Sizes from 5 H.P. to 300 H.P. Also built for other applications in pressures up to 10,000 PSI.

Baled metal scrap, speedily and systematically salvaged from the production lines of industry has been a vital factor in keeping the nation's steel mills operating at top capacity. Galland-Henning Type MCY Balers, pictured above, are BIG GUNS in this Scrap-For-Victory Program — have helped to keep a steady flow of dense, compact mill-size bales moving back to the mills for quick, low-cost conversion into usable form.

If your manufacturing operations produce steel stampings and clippings or non-ferrous scrap at the rate of ¼ ton-per-hour and up, a Galland-Henning Baler of the proper size and capacity can solve your scrap disposal and salvage problems on a profitable basis.

Galland-Henning engineers offer you the benefit of over 30 years experience in working out successful salvaging programs, based on low-cost scrap-metal baling, for all types of metal working plants. Ask for their counsel — no obligation!

The Scrap-For-Victory Program Needs BALED Metal Scrap!

G-H

GALLAND-HENNING MFG. CO.

2747 SOUTH 31ST STREET • MILWAUKEE, WISCONSIN

A 3827-1P

MARKET SUMMARY

DEMAND	PRODUCTION	PRICES
Strong.	*Advanced ½-point to 97½ per cent.*	*Steady.*

Effective Steel Distribution Is Problem

Operation of PRP will provide more accurate check of future demand . . . Capacity of all war factories may not be satisfied even with further curb on less essential industries

THE difficult problem of trimming potential steel demand to fit the available supply with the least harmful effect on the war production program will be given an opportunity for partial solution through disposition by WPB of Production Requirements Plan applications for fourth quarter material.

With use of PRP mandatory for a large part of industry, a more accurate determination of future steel requirements is possible. By measuring these needs against indicated supplies the extent of the deficiency in the latter becomes apparent. However, even though authorizations for steel purchases by less essential consumers are scaled down further it is questionable whether all of the existing and prospective capacity for production of war goods can be fully satisfied.

In any event, there is some hope that concentration on this distribution problem will result in a more orderly situation before the end of the year in the purchasing and scheduling of steel products.

• • •

Just how steel supplies are to be apportioned for the production of various implements of war is something for the government service departments to determine. The pressure to build cargo ships is causing a larger tonnage of steel to be diverted for this purpose than was planned when the President announced the country's war production goals for this year. Had the original aim of 8,000,000 deadweight tons of shipping facilities been adhered to, additional steel would have been available for war plants whose schedules have become irregular through temporary interruptions of the flow of materials. The whole matter settles down to a question of determining the order of our most important war needs and of dividing up the material supply to satisfy them, even though idle plants follow in the wake of the process.

As an instrument in determining the urgency of manufacture of various finished products, WPB has been making use of a standard method of identification of use of material, termed the Allocation Classification System. Simplification of this system is in process and is expected to be announced shortly, to be called the Production Code. It will follow the same basic principles as its predecessor but incorporates several important revisions.

Many steel orders have been rerated to the AA level, because of the preponderance of bookings for war work. While there are some fears expressed that the rerating procedure will merely step up A ratings to the higher bracket without changing their former relationship, the process is a selective one. For instance, many A ratings have been raised to AA but with the provision that the latter is to apply only when the orders are for material required for aircraft, ships, vehicles and guns.

• • •

The scrap situation continues critical insofar as the future is concerned. Supplies are sufficient to maintain near-capacity operations at present, but the necessity of accumulating a reserve to tide mills over the winter when collections normally shrink makes it mandatory that shipments be stepped up further. This task is made more difficult by the fact that readily accessible tonnages already have been gathered. Auto graveyards, for example, are believed to have passed the peak as a source of scrap.

Despite heavy production of structural shapes the past two months and the decline in private building work, supplies continue tight. Needs of shipyards and miscellaneous fabrication for war equipment have taken up much of the slack caused by the ban on certain types of construction.

Certain producers of beehive coke for blast furnace use have been allowed a 50-cent advance in their price ceiling. The increase applies only to high-cost producers in Pennsylvania, those operating hand-drawn ovens and using trucked coal.

Variations in the steelmaking rate continue moderate. National operations last week rose ½-point to 97½ per cent on small gains by the five largest districts, although several areas showed losses. Increases were 1 point to 94 per cent at Pittsburgh, 1 point to 102 per cent at Chicago, 3 points to 95 in eastern Pennsylvania, 2 points to 96 at Youngstown, 3 points to 83.5 at Wheeling and 1 point to 91 at Detroit. Cleveland was off 3 points to 94.5, New England was down 5 points to 90, Cincinnati lost 1 point to 88 and St. Louis slumped 14.5 points to 83.5. Buffalo and Birmingham were unchanged at 90.5 and 95, respectively.

Consumption of Lake Superior iron ore advanced further in July to 6,956,924 gross tons, gain of 129,659 tons over June and 589,588 tons over a year ago. Consumption the first seven months of 1942 was 5,400,481 tons ahead of the 1941 period. Despite heavier requirements, movement of ore from the mines is holding stocks at furnaces and on Lake Erie docks at a higher level than a year ago. Total stocks Aug. 1 were 37,326,533 tons.

COMPOSITE MARKET AVERAGES

	Aug. 22	Aug. 15	Aug. 8	One Month Ago July, 1942	Three Months Ago May, 1942	One Year Ago Aug., 1941	Five Years Ago Aug., 1937
Finished Steel	$56.73	$56.73	$56.73	$56.73	$56.73	$56.73	$62.18
Semifinished Steel	36.00	36.00	36.00	36.00	36.00	36.00	40.00
Steelmaking Pig Iron	23.05	23.05	23.05	23.05	23.05	23.05	22.84
Steelmaking Scrap	19.17	19.17	19.17	19.17	19.17	19.17	20.50

Finished Steel Composite:—Average of industry-wide prices on sheets, strip, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Aug. 22, 1942	July 1942	May 1942	Aug. 1941
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.15c
Steel bars, Chicago	2.15	2.15	2.15	2.15
Steel bars, Philadelphia	2.49	2.49	2.49	2.47
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.22	2.22	2.22	2.215
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, Pitts.	2.60	2.60	2.60	2.60
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.00
Wire nails, Pittsburgh	2.55	2.55	2.55	2.55

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$34.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods No. 5 to 9/32-inch, Pitts.	2.00	2.00	2.00	2.00

Pig Iron

	Aug. 22, 1942	July 1942	May 1942	Aug. 1941
Bessemer, del. Pittsburgh	$25.19	$25.19	$25.19	$25.34
Basic, Valley	23.50	23.50	23.50	23.50
Basic, eastern, del. Philadelphia	25.39	25.39	25.39	25.34
No. 2 fdry., del. Pgh., N.&S. Sides	24.69	24.69	24.69	24.69
No. 2 foundry, Chicago	24.00	24.00	24.00	24.00
Southern No. 2, Birmingham	20.38	20.38	20.38	20.38
Southern No. 2, del. Cincinnati	24.30	24.30	24.30	24.06
No. 2X, del. Phila. (differ. av.)	26.265	26.265	26.265	26.215
Malleable, Valley	24.00	24.00	24.00	24.00
Malleable, Chicago	24.00	24.00	24.00	24.00
Lake Sup., charcoal, del. Chicago	31.54	31.54	31.54	31.34
Gray forge, del. Pittsburgh	24.19	24.19	24.19	24.19
Ferromanganese, del. Pittsburgh	140.65	140.65	140.65	125.33

Scrap

Heavy melting steel, Pitts.	$20.00	$20.00	$20.00	$20.00
Heavy melt. steel, No. 2, E. Pa.	18.75	18.75	18.75	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	21.50

Coke

Connellsville, furnace, ovens	$6.00	$6.00	$6.00	$6.25
Connellsville, foundry, ovens	7.25	7.25	7.25	7.25
Chicago, by-product fdry., del.	12.25	12.25	12.25	12.25

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Following are maximum prices established by OPA Schedule No. 6 issued April 16, 1941, revised June 20, 1941 and Feb. 4, 1942 The schedule covers all iron or steel ingots, all semifinished iron or steel products, all finished hot-rolled, cold-rolled iron or steel products and any iron or steel product which is further finished by galvanizing, plating, coating, drawing, extruding, etc., although only principal established basing points for selected products are named specifically. All seconds and off-grade products also are covered. Exceptions applying to individual companies are noted in the table.

Semifinished Steel

Gross ton basis except wire rods, skelp.

Carbon Steel Ingots: F.o.b. mill base, rerolling qual., stand. analysis, $31.00.
(Empire Sheet & Tin Plate Co., Mansfield, O., may quote carbon steel ingots at $33 gross ton, f.o.b. mill.)

Alloy Steel Ingots: Pittsburgh base, uncropped, $45.00.

Rerolling Billets, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, $34.00; Detroit, del. $36.25; Duluth (bil.) $36.00.
(Wheeling Steel Corp. allocated 21,000 tons 2" square, base grade rerolling billets under lease-lend during first quarter 1942 at $37, f.o.b. Portsmouth, O.; Andrews Steel Co. may quote carbon steel slabs $41 gross ton at established basing points.)

Forging Quality Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $40.00; Detroit, del. $42.25; Duluth, $42.00.
(Andrews Steel Co. may quote carbon forging billets $50 gross ton at established basing points.)

Open Hearth Shell Steel: Pittsburgh, Chicago, base 1000 tons one size and section: 3-12 in., $52.00; 12-18 in., $54.00; 18 in. and over, $56.00.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $54.00.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $34.00.
(Empire Sheet & Tin Plate Co., Mansfield, O. may quote carbon steel sheet bars at $39 gross ton, f.o.b. mill.)

Skelp: Pittsburgh, Chicago, Sparrows Pt., Youngstown, Coatesville, lb., $1.90.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, No. 5—9/32 in., inclusive, per 100 lbs., $2.00.

Do., over 9/32—47/64-in., incl., $2.15. Worcester add $0.10 Galveston, $0.27. Pacific Coast $0.50 on water shipment.

Bars

Hot-Rolled Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, base 20 tons one size, 2.15c; Duluth, base 2.25c; Detroit, del. 2.27c; New York del. 2.51c; Phila. del. 2.49c; Gulf Ports, dock 2.52c, all-rail 2.59c Pac. ports, dock 2.50c; all rail 3.25c.
(Phoenix Iron Co., Phoenixville, Pa., may quote 2.35c at established basing points.)
Joslyn Mfg. Co. may quote 2.35c, Chicago base.)

Rail Steel Bars: Same prices as for hot-rolled carbon bars except base is 5 tons.
(Sweet's Steel Co., Williamsport, Pa., may quote rail steel merchant bars 2.33c f.o.b. mill.

Hot-Rolled Alloy Bars: Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 2.70c Detroit, del. 2.82c.

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.35	5100 Spr. flats	0.15
2100	0.75	5100 80-1.10 Cr	0.15
2300	1.70	6100 Bars	1.20
2500	2.55	6100 Spr. flats	0.85
3100	0.70	Carb., Van.	0.85
3200	1.35	9200 Spr. flats	0.15
3300	3.80	9200 Spr. rounds, squares	0.40
3400	3.20	T 1300, Mn, mean	
4100 .15-25 Mo. 46.00 .20-.30 Mo. 1.50-2.00; Ni	0.55 1.20	1.51-2.00	0.10
		Do., carbon under 0.20 max.	0.35

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lbs., 2.65c; Detroit 2.70.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 3.35c; Detroit, del. 3.47c.

Turned, Ground Shafting: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base (not including turning, grinding, polishing extras) 2.65c; Detroit 2.72c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base 2.15c; Detroit del. 2.27c; Gulf ports, dock 2.52c, all-rail 2.61c; Pacific ports, dock 2.80c, all-rail 3.27c.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, base 2.15c; Detroit, del. 2.27c; Gulf ports, dock 2.52c, all-rail 2.61c; Pacific ports, dock 2.80c, all-rail 3.25c.
(Sweet's Steel Co., Williamsport, Pa., may quote rail steel reinforcing bars 2.33c, f.o.b. mill.

Iron Bars: Single refined, Pitts. 4.40c, double refined 5.40c; Pittsburgh, staybolt, 5.75c; Terre Haute, common, 2.15c.

Sheets, Strip

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Pt., Middletown, base 2.10c; Granite City, base 2.20c; Detroit del. 2.22c; Phila. del. 2.28c; New York del., 2.35c Pacific ports 2.65c.
(Andrews Steel Co. may quote hot-rolled sheets for shipment to Detroit and the Detroit area on the Middletown, O. base.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.05c; Granite City, base 3.15c; Detroit del. 3.17c; New York del. 3.41c; Phila. del. 3.39c; Pacific ports, 3.70c.

Galvanized Sheets, No. 24: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base 3.50c; Granite City, base 3.60c; New York del. 3.74c Phila. del. 3.68c; Pacific ports 4.05c.
(Andrews Steel Co. may quote galvanized sheets 3.75c at established basing points.)

Corrugated Galv. Sheets: Pittsburgh, Chicago, Gary, Birmingham, 29 gage, per square 3.31c.

Culvert Sheets: Pittsburgh, Chicago, Gary, Birmingham, 16 gage, not corrugated, copper alloy 3.60c; copper iron 3.90c, pure iron 3.95c; zinc-coated, hot-dipped, heat-treated, No. 24, Pittsburgh 4.25c.

Enameling Sheets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 10 gage,

base 2.75c; Granite City, base 2.85c; Pacific ports 3.40c.
Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 20 gage, base 3.35c; Granite City, base 3.45c; Pacific ports 4.00c.

Electrical Sheets, No. 24:

	Pittsburgh 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.)

Steel Sheet Piling: Pittsburgh, Chicago, Buffalo, 2.40c.

Wire Products, Nails

Wire: Pittsburgh, Chicago, Cleveland, Birmingham (except spring wire) to manufacturers in carloads (add $2 for Worcester):

Bright basic, bessemer wire	2.60c
Galvanized wire	2.60c
Spring wire	3.20c

Wire Products to the Trade:

Standard and cement-coated wire nails, polished and staples, 100-lb. keg	$2.55
Annealed fence wire, 100 lb.	3.05
Galvanized fence wire, 100 lb.	3.40
Woven fence, 12½ gage and lighter, per base column	67
Do., 11 gage and heavier	70
Barbed wire, 80-rod spool, col.	70
Twisted barbless wire, col.	70
Single loop bale ties, col.	59
Fence posts, carloads, col.	69
Cut nails, Pittsburgh, carloads	$3.85

Pipe, Tubes

Welded Pipe: Base price in carloads to consumers about $200 per net ton. Base discounts on steel pipe Pittsburgh and Lorain, O.; Gary, Ind. 2 points less on lap weld, 1 point less on butt weld. Pittsburgh base only on wrought iron pipe.

Butt Weld

In.	Steel Blk.	Steel Galv.	In.	Iron Blk.	Iron Galv.
⅛	56	33	½	24	3½
¼ & ⅜	59	40½	¾	30	10
½	63½	51	1-1¼	34	16
¾	66½	55	1½	38	18½
1-3	68½	57½	2	37½	18

Lap Weld

In.	Steel Blk.	Steel Galv.	In.	Iron Blk.	Iron Galv.
2	61	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
2¼"	12	16.01	18.45	15.16	.....
2½"	12	17.54	20.21	16.58	26.57
2¾"	12	18.59	21.42	17.54	29.00
3"	12	19.50	22.48	18.35	31.38
3½"	11	24.63	28.37	23.15	39.81
4"	10	30.54	35.20	28.66	49.90
4½"	10	37.35	43.04	35.22	.....
5"	9	46.87	54.01	44.25	73.93
6"	7	71.96	82.93	68.14	.....

Rails, Supplies

Standard rails, over 60-lb., f.o.b. mill, gross ton, $40.00.
Light rails (billet), Pittsburgh, Chicago, Birmingham, gross ton, $40.00.
*Relaying rails, 35 lbs. and over, f.o.b. railroad and basing points, $28-$30.
Supplies: Angle bars, 2.70c; tie plates, 2.15c; track spikes, 3.00c; track bolts, 4.75c; do. heat treated, 5.00c.

*Fixed by OPA Schedule No. 46, Dec. 15, 1941.

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, base, cents per lb.: Reg. carbon 14.00c; extra carbon 18.00c; special carbon 22.00c; oil-hardening 24.00c; high car.-chr. 43.00c.

High Speed Tool Steels:

Tung.	Chr.	Van.	Moly.	Pitts. base, per lb.
18.00	4	1	..	67.00c
18.00	4	2	1	77.00c
18.00	4	3	1	87.00c
1.5	4	1	8.5	54.00c
.....	4	2	8	54.00c
5.50	4	1.50	4	57.50c
5.50	4.50	4	4.50	70.00c

Stainless Steels

Base, Cents per lb.—f.o.b. Pittsburgh

Type	Bars	Plates	Sheets	H. R. Strip	C. R. Strip
CHROMIUM NICKEL STEEL					
302	24.00c	27.00c	34.00c	21.50c	28.00c
303	26.00	29.00	36.00	27.00	33.00
304	25.00	29.00	36.00	23.50	30.00
308	29.00	34.00	41.00	28.50	35.00
309	36.00	40.00	47.00	37.00	47.00
310	49.00	52.00	53.00	48.75	56.00
311	49.00	52.00	53.00	48.75	56.00
312	36.00	40.00	49.00	.....	.....
*316	40.00	44.00	48.00	40.00	48.00
*317	50.00	54.00	58.00	50.00	58.00
†321	29.00	34.00	41.00	29.25	38.00
†347	33.00	38.00	45.00	33.00	42.00
431	19.00	22.00	29.00	17.50	22.50
STRAIGHT CHROMIUM STEEL					
403	21.50	24.50	29.50	21.25	27.00
**410	18.50	21.50	26.50	17.00	22.00
416	19.00	22.00	27.00	18.25	23.50
††420	24.00	28.50	33.50	23.75	36.50
430	19.00	22.00	29.00	17.50	22.50
‡‡430F.	19.50	22.50	29.50	18.75	24.50
442	22.50	25.50	32.50	24.00	32.00
446	27.50	30.50	36.50	35.00	52.00
501	8.00	12.00	15.75	12.00	17.00
502	9.00	13.00	16.75	13.00	18.00
STAINLESS CLAD STEEL (20%)					
304	.....	§§18.00	19.00	.....	.....

*With 2-3% moly. †With titanium. ‡With columbium. **Plus machining agent. ††High carbon. ‡‡Free machining. §§Includes annealing and pickling.

Basing Point Prices are (1) those announced by U. S. Steel Corp. subsidiaries for first quarter of 1941 or in effect April 16, 1941 at designated basing points or (2) those prices announced or customarily quoted by other producers at the same designated points. Base prices under (2) cannot exceed those under (1) except to the extent prevailing in third quarter of 1940.

Extras mean additions or deductions from base prices in effect April 16, 1941.

Delivered prices applying to Detroit, Eastern Michigan, Gulf and Pacific Coast points are deemed basing points except in the case of the latter two areas when water transportation is not available, in which case nearest basing point price plus all-rail freight may be charged.

Domestic Ceiling prices are the aggregate of (1) governing basing point price, (2) extras and (3) transportation charges to the point of delivery as customarily computed. **Governing basing point** is basing point nearest the consumer providing the lowest delivered price. **Emergency basing point** is the basing point at or near the place of production or origin of shipment.

Dislocated tonnage: Producers shipping material outside their usual marketing areas because of the war emergency may charge the basing point price nearest place of production plus actual cost of transportation to destination.

Seconds or off-grade iron or steel products cannot be sold at delivered prices exceeding those applying to material of prime quality.

Export ceiling prices may be either the aggregate of (1) governing basing point or emergency basing point (2) export extras (3) export transportation charges provided they are the f.a.s. seaboard quotations of the U. S. Steel Export Co. on April 16, 1941. Domestic or export extras may be used in case of Lease-Lend tonnage.

Bolts, Nuts

F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discounts for carloads additional 5%, full containers, add 10%.

Carriage and Machine

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.
⅞-inch and less	62	64
½-1-inch	59	60
1⅛-1½-inch	57	58
1⅝ and larger	56	..

Hexagon Cap Screws

Upset 1-in., smaller	64 off
Milled 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	71 off
Headless, ¼-in., larger	60 off
No. 10, smaller	70 off

Piling

Pittsburgh, Chicago, Buffalo	2.40c

Rivets, Washers

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham

Structural	3.75c
⅞-inch and under	65-5 off
Wrought washers, Pittsburgh, Chicago, Philadelphia, to jobbers and large nut, bolt manufacturers l.c.l.	$2.75-3.00 off

Metallurgical Coke

Price Per Net Ton

Beehive Ovens

Connellsville, furnace	$6.00
Connellsville, foundry	7.00- 7.50
Connellsville prem. fdry.	7.25- 7.60
New River, foundry	8.00- 8.25
Wise county, foundry	7.50
Wise county, furnace	6.50

By-Product Foundry

Kearny, N. J., ovens	12.15
Chicago, outside delivered	11.50
Chicago, delivered	12.25
Terre Haute, delivered	12.00
Milwaukee, ovens	12.25
New England, delivered	13.75
St. Louis, delivered	12.25
Birmingham, ovens	8.50
Indianapolis, delivered	12.00
Cincinnati, delivered	11.75
Cleveland, delivered	12.30
Buffalo, delivered	12.50
Detroit, delivered	12.25
Philadelphia, delivered	12.38

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	$29.00

Pig Iron

Prices (in gross tons) are maximums fixed by OPA Price Schedule No. 10, effective June 10, 1941. Exceptions indicated in footnotes. Allocation regulations from WPB Order M-17, expiring Dec. 31, 1942. Base prices bold face, delivered light face.

	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	$25.00	$24.50	$26.00	$25.50
Newark, N. J., del.	26.62	26.12	27.62	27.12
Brooklyn, N. Y., del.	27.65	.....	.....	28.15
Birdsboro, Pa., del.	25.00	24.50	26.00	25.50
Birmingham, base	†20.38	†19.00	.....	.....
Baltimore, del.	25.67	.....	.....	.....
Boston, del.	25.12	.....	.....	.....
Chicago, del.	‡24.47	.....	.....	.....
Cincinnati, del.	24.30	22.92	.....	.....
Cleveland, del.	24.12	23.24	.....	.....
Newark, N. J., del.	26.24	.....	.....	.....
Philadelphia, del.	25.51	25.01	.....	.....
St. Louis, del.	‡24.12	23.24	.....	.....
Buffalo, base	24.00	23.00	25.00	24.50
Boston, del.	25.50	25.00	26.50	26.00
Rochester, del.	25.53	.....	26.53	26.03
Syracuse, del.	26.08	.....	27.08	26.58
Chicago, base	24.00	23.50	24.50	24.00
Milwaukee, del.	25.17	24.67	25.67	25.17
Muskegon, Mich., del.	27.38	.....	.....	27.38
Cleveland, base	24.00	23.50	24.50	24.00
Akron, Canton, O., del.	25.47	24.97	25.97	25.47
Detroit, base	24.00	23.50	24.50	24.00
Saginaw, Mich., del.	26.45	25.95	26.95	26.45
Duluth, base	24.50	.....	25.00	24.50
St. Paul, del.	26.76	.....	27.26	26.76
Erie, Pa., base	24.00	23.50	25.00	24.50
Everett, Mass., base	25.00	24.50	26.00	25.50
Boston	25.50	25.00	26.50	26.00
Granite City, Ill., base	24.00	23.50	24.50	24.00
St. Louis, del.	24.50	24.00	.....	24.50
Hamilton, O., base	24.00	23.50	.....	24.00
Cincinnati, del.	24.68	24.68	.....	25.35
Neville Island, Pa., base	24.00	23.50	24.50	24.00
§Pittsburgh, del., No. & So. sides	24.69	24.19	25.19	24.69
Provo, Utah, base	22.00	.....	.....	.....
Sharpsville, Pa., base	24.00	23.50	24.50	24.00
Sparrows Point, Md., base	25.00	24.50	.....	.....
Baltimore, del.	26.05	.....	.....	.....
Steelton, Pa., base	.....	24.50	.....	25.50
Swedeland, Pa., base	25.00	24.50	26.00	25.50
Philadelphia, del.	25.89	25.39	.....	26.39
Toledo, O., base	24.00	23.50	24.50	24.00
Mansfield, O., del.	26.06	25.56	26.56	26.06
Youngstown, O., base	24.00	23.50	24.50	24.00

*Basic silicon grade (1.75-2.25%), add 50c for each 0.25%. †For phosphorus 0.70 and over deduct 38c. ‡Over 0.70 phos. §For McKees Rocks, Pa., add .55 to Neville Island base; Lawrenceville, Homestead, McKeesport, Ambridge, Monaca, Aliquippa, .84; Monessen, Monongahela City .97 (water); Oakmont, Verona 1.11; Brackenridge 1.24.

High Silicon, Silvery

6.00-6.50 per cent (base)	$29.50		
6.51-7.00	$30.50	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.

Export Prices: In case of exports only, the governing basing point nearest point of production may be used, plus differentials and export transportation charges.

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

Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$23.00-25.00
Do., barge	23.00-25.00
No. 2 lump	23.00-25.00

(OPA May 11 established maximum at Jan. 2, 1942, level.)

Ferroalloy Prices

Ferromanganese: 78-82%, carlots, gross ton, duty paid, Atlantic ports, $135; Del. Pittsburgh $140.65; f.o.b. Southern furnaces $135; Add $6 per gross ton for packed carloads $10 for ton, $13.50 for less-ton and $18 for less than 200-lb. lots, packed.

Spiegeleisen: 19-21%, carlots per gross ton, Palmerton, Pa. $36.

Silico-manganese Briquets: Contract basis in carloads per pound, bulk freight allowed 5.50c; packed 5.75c; ton lots 6.00c; less-ton lots 6.25c; less 200-lb. lots 6.50c. Spot prices ¼-cent higher.

Electrolytic manganese: 99.9% plus, less carlots, per lb. 42.00c.

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 $128; ton lots $140.50. Spot $5 per ton 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. producer's plant with usual freight allowances; open-hearth grade $2.70; special grade $2.80; highly-special grade $2.90.

Vanadium Pentoxide: Technical grade, 88-92 per cent 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

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials. As of April 16, 1942

	Soft Bars	Hot-rolled Strip 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
Pittsburgh	3.35	3.60	3.60	3.40	3.40	5.00	3.35	....	4.65	....	3.65	8.40	6.75
Cleveland	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.05	4.62	3.20	3.75	8.40	6.75
Detroit	3.43	3.43	3.68	3.60	3.65	5.27	3.43	4.30	4.84	3.40	3.80	8.70	7.05
Omaha	4.10	4.20	4.20	4.15	4.15	5.75	3.85	5.32	5.50	....	4.42	....	....
Cincinnati	3.60	3.67	3.67	3.65	3.68	5.28	3.42	4.37	4.92	3.45	4.00	8.75	7.10
Chicago	3.50	3.60	3.60	3.55	3.55	5.15	3.25	4.10	4.85	3.50	3.75	8.40	6.75
Twin Cities	3.75	3.85	3.85	3.80	3.80	5.40	3.50	4.35	5.00	3.83	4.34	9.09	7.44
Milwaukee	3.63	3.53	3.53	3.68	3.68	5.28	3.38	4.23	4.98	3.54	3.88	8.38	6.98
St. Louis	3.64	3.74	3.74	3.69	3.69	5.29	3.39	4.24	4.99	3.61	4.02	8.77	7.12
Indianapolis	3.60	3.75	3.75	3.70	3.70	5.30	3.45	....	5.01	....	3.97	....	....
Chattanooga*	3.80	4.00	4.00	3.85	3.85	5.80	3.75	....	4.50	....	4.39	....	....
Memphis	3.90	4.10	4.10	3.95	3.95	5.71	3.85	....	5.25	....	4.31	....	....
Birmingham	3.50	3.70	3.70	3.55	3.55	5.93	3.45	....	4.75	....	4.43	....	....
New Orleans	4.00	4.10	4.10	3.80	3.80	5.75	3.85	....	5.25	5.00	4.60	....	....
Houston, Tex.	3.75	4.30	4.30	4.05	4.05	5.50	4.00	....	5.25	....	6.90	....	....
Seattle	4.20	4.25	5.45	4.75	4.45	6.50	4.65	7.60	5.70	....	5.75	....	....
Los Angeles	4.35	4.90	6.70	4.90	4.60	7.15	4.95	7.15	5.95	....	6.60	10.55	9.55
San Francisco	3.95	4.50	6.25	4.65	4.35	6.35	4.55	6.40	6.10	....	6.80	10.80	9.80

*Not named in OPA price order.

	S.A.E. Hot-rolled Bars (Unannealed) 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.28	7.75	6.05	5.80	7.90
New York (Met.)	4.04	7.60	5.90	5.65	....
Philadelphia	4.10	7.56	5.86	5.61	8.56
Baltimore	4.45	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.35	5.65	5.40	7.50
Pittsburgh	3.40	7.45	5.75	5.50	7.60
Cleveland	3.30	7.55	5.85	5.85	7.70
Detroit	3.48	7.67	5.97	5.72	7.19
Cincinnati	3.65	7.69	5.99	5.74	7.84
Chicago	3.70	7.35	5.65	5.40	7.50
Twin Cities	3.95	7.70	6.00	6.09	8.19
Milwaukee	3.83	7.33	5.88	5.63	7.73
St. Louis	3.84	7.72	6.02	5.77	7.87
Seattle	6.25	....	8.00	7.85	8.65
Los Angeles	4.80	9.55	8.55	8.40	8.80
San Francisco	5.45	9.80	8.80	8.65	9.05

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds; 300-1999 pounds in Los Angeles; 400-39,999 (hoops, 0-299) in San Francisco; 300-4999 pounds in Portland; 300-9999 Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in B'ham., Memphis.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York, Omaha, Kansas City, St. Louis; 450-3749 in Boston; 500-1499 in Buffalo; 1000-1999 in Philadelphia, Baltimore; 750-4999 in San Francisco; 300-4999 in Portland, Seattle; any quantity in Twin Cities, New Orleans; 300-1999 Los Angeles.

Galvanized Sheets: Base, 150-1499 pounds, New York; 150-1499 in Cleveland, Pittsburgh, Baltimore, Norfolk; 150-1049 in Los Angeles; 300-10,000 in Portland, Seattle; 450-3749 in Boston; 500-1499 in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, Indianapolis, Milwaukee, Omaha, St. Louis, Tulsa; 3500 and over in Chattanooga; any quantity in Twin Cities; 750-1500 in Kansas City; 150 and over in Memphis; 25 to 49 bundles in Philadelphia: 750-4999 in San Francisco.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1500 pounds and over on carbon, except 0-299 in San Francisco, 500-999, Los Angeles, 1000 and over in Portland, Seattle; 1000 pounds and over on alloy, except 0-4999 in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 pounds and over, except 0-4999, San Francisco; 0-1999, Portland, Seattle.

EUROPEAN IRON, STEEL PRICES

Dollars at $4.02½ per Pound Sterling

Export Prices f.o.b. Port of Dispatch—

By Cable or Radio

	BRITISH Gross Tons f.o.b. U.K. Ports	L	s	d
Merchant bars, 3-inch and over	$66.50	16	10	0
Merchant bars, small, under 3-inch, re-rolled	3.60c	20	0	0
Structural shapes	2.95c	15	10	0
Ship plates	2.90c	16	2	6
Boiler plates	3.17c	17	12	6
Sheets, black, 24 gage	4.00c	22	5	0
Sheets, galvanized, corrugated, 24 gage	4.61c	25	12	6
Tin plate, base box, 20 x 14, 108 pounds	$ 6.20	1	10	9

British ferromanganese $120.00 delivered Atlantic seaboard duty-paid.

Domestic Prices Delivered at Works or Furnace—

		L	s	d
Foundry No. 3 Pig Iron, Silicon 2.50-3.00	$25.79	6	8	0(a)
Basic pig iron	24.28	6	0	6(a)
Furnace coke, f.o.t. ovens	8.87	2	4	0
Billets, basic soft, 100-ton lots and over	49.37	12	5	0
Standard rails, 60 lbs. per yard, 500-ton lots & over	2.61c	14	10	6
Merchant bars, rounds and squares, under 3-inch	3.17c	17	12	0††
Shapes	2.77c	15	8	0††
Ship plates	2.91c	16	3	0††
Boiler plates	3.06c	17	0	6††
Sheets, black, 24 gage, 4-ton lots and over	4.10c	22	15	0
Sheets, galvanized 24 gage, corrugated, 4-ton lots & over	4.70c	26	2	
Plain wire, mild drawn, catch weight coils, 2-ton lots and over	4.28c	23	15	0
Bands and strips, hot-rolled	3.30c	18	7	0

(a) del. Middlesbrough. 5s rebate to approved customers. ††Rebate 15s on certain conditions.

Ores

Lake Superior Iron Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.75
Mesabi bessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer	4.30

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63%, contract	12.00

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

Gross ton c.i.f. Baltimore; dry basis; subject to penalties for guarantees

Indian and African, 2.8:1 lump, 48%	$39.00
South African (excluding war risk)	
No ratio lump, 44%	28.00
Do. 45%	29.00
Do. 48%	34.00
Do. concentrates, 48%	33.00
Do. 50%	34.00
Brazilian (nominal)	
2.5:1 lump, 44%	28.50
3:1 lump, 48%	38.00

Manganese Ore

(Nominal)

Including war risk but not duty, cents per unit cargo lots

Caucasian, 50-52%	
S. African, 48%	80.00-86.00
Indian, 50%	80.00-86.00
Brazilian, 46%	78.00-84.00
Cuban, 51%, duty free	85.00
Domestic, 48%, f.o.b. mines	$1.00

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

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, tube scrap $3 over, auto springs, crankshafts, $1 over No. 1 heavy melting. Blast Furnace Grades refer to mixed borings and turnings, shoveling turnings, No. 2 busheling 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

Nothing below AA-2 is being scheduled by some Eastern sheet producers, and while confusion over re-rating and other complicated factors involved in distribution is noted progress is steady toward clarifying the situation. Heavy volume of jobber orders has forced mills in some cases to stop rollings below AA-3. With efforts to syphon material into the war industries in greater volume more promptly, fewer, but larger orders, are the rule with the aggregate volume of hot-rolled and hot-rolled pickled sheets maintained with cold-rolled and higher finished stock for war production lagging.

Much cold-rolled capacity in the East is down and producers are competitive for highly-rated cold-rolled tonnage. More stamping shops without war contracts are confronted with shutdowns within the next 30 to 60 days because of lack of metal. Steel and enamel cooking utensils for civilian use are in this category, many finding it impossible to pick up odd lots which have kept them going in the past. Jobber stocks of utensils are varied, generally below normal, but department stores, the larger ones especially, are covered through the balance of the year. Scattered shops have large orders for army and navy cooking utensils or have otherwise entered war production, some items formerly fabricated of stainless sheets now being formed from mild cold-rolled material.

Manufacturers in the Middle West seeking sheets are finding difficulty in placing requirements because continuous mills have converted so extensively to production of the lighter thicknesses of plates.

One large steelmaker expects to be little affected by the recent order L-79-B, restricting construction of railroad-type industrial cars. Reason is that it had little of this business.

Narrow cold strip bookings are concentrated among relatively few accounts engaged in war production, hundreds of regular consumers having disappeared from backlogs. New orders are fewer, but are maintained at the recent heavy volume, although incoming placements are more spotty. In the East, allocation of approximately 70,000 tons of copper-clad strip per month for small calibre cartridge cups is outstanding. Mills are heavily booked with high carbon material, several to the extent they can take no additional orders for delivery this year. On the other hand buying of low carbon drags, resulting in an unbalanced production situation and retarding total output at most mills. Except for producers operating under PRP most orders have been re-rated and the bulk of new business carries AA, hot strip replacements being on the same basis; while some hot strip is being taken at A-1-a, deliveries are indefinite.

Plates

Plate Prices, Page 95

Allocation and probably shipments of steel plates for September will be scheduled heavier than August, although part of allotments this month will not be delivered in full. Increased shipbuilding tempo calls for heavy deliveries, and while this accounts for the bulk of plate requirements, miscellaneous fabrication

One Hand Driving • Power Tools • Tighter Assembly = 50% Less Assembly Time with Phillips Screws

B. P. (Before Phillips). Slow-driving slotted screws required two hands to aim the screw and steady the work — and still accidents happened, causing plenty of mangled fingers or scars in the work. Always something going wrong — crooked screws — heads splitting — burrs to remove — loose assemblies. Thank goodness those days are gone forever!

A. P. (After Phillips). Faster-driving Phillips Recessed Head Screws need only one hand . . . the other hand is free for support. No fumbled screws — straight, effortless driving. Even when assembling parts already finished — like enameled, painted or other easily-scratched surfaces — power driving is safe, because there's no danger of driver slippage. And screws can be set up tight without heads splitting or raising burrs.

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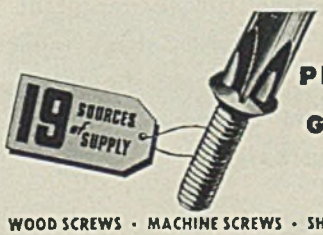

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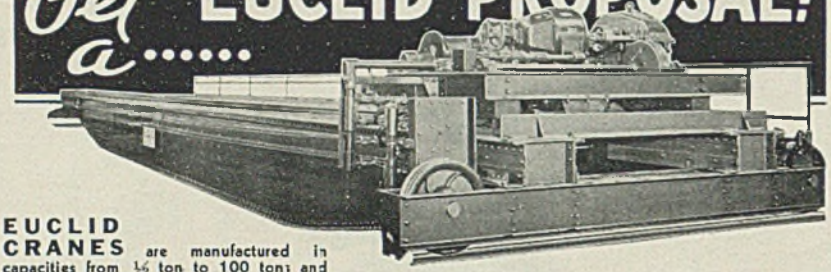

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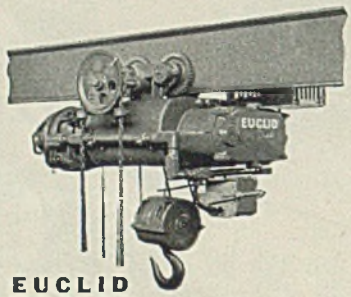

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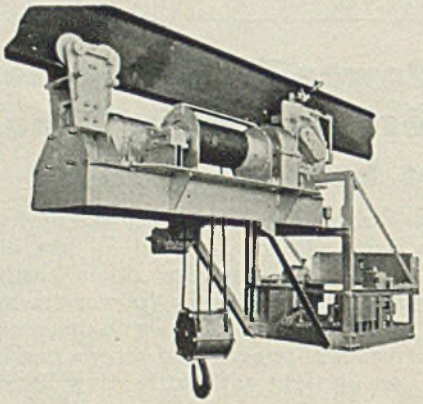

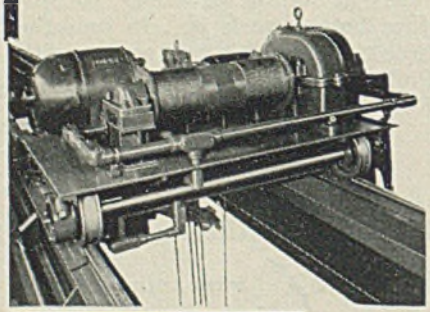

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These statements can be confirmed by referring to The Euclid Crane & Hoist Catalogs which show in detail the construction of all important parts. An effort has been made to anticipate the questions that occur to prospective purchasers.

Copies of either or both catalogs will be mailed on request. Write for them.

EUCLID CRANES & HOISTS

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connected with the war effort absorbs a large volume, including armor plate for tanks.

Channeling of steel into products urgently needed this year is increasingly reflected in plate consumption. With heavier allocations in the near future expected, the question arises as to where the capacity can be found to meet the burden unless further raids on sheet capacity are made.

Large storage tank inquiry is confined to most important war needs, and several thousand tons for roofs and patching are required for storage facilities in connection with the oil pipe line being constructed between Texas and Illinois. Old tanks are likely to be re-erected for part of the project, but these will take new steel for roofs and repairs. Strong demand continues for floor plates which are under full allocation, even to the smallest gages.

Bars

Bar Prices, Page 94

Considerable steel bar tonnage covered by re-ratings in the AA brackets is delayed in scheduling by confusion attending the entire priority system. More progress is being made with directives under the mill quota plan and PRP.

The tie-up revolving around priority re-ratings is reflected in a drop in new bookings, which are down sharply, one large producer reporting total sales last week as the lowest in more than two years.

Small carbon bars can be delivered in some instances on A-1-a, but as diameters increase, shipments become more extended and required ratings are higher, notably for material for heavy forging. Deliveries on larger diameters extend well into next year. Current deliveries to cold rollers show no increase to date.

Alloys are tighter and delays growing out of substitution of alloy specifications, which are subject to final official approval, are frequently holding up processing schedules several weeks. Even for most important tonnages of alloys connected with war production 32 to 40 weeks is required for shipment.

Pipe

Pipe Prices, Page 95

Demand for steel pipe has slackened with both distributors and mills, but shipbuilding requirements are holding and even increasing in some directions. Plumbing supply jobbers are slowly being squeezed out, lacking priorities high enough to secure material for the bulk of normal volume. Lighter inquiry appears for construction, utilities and generally for oil industry consumers. A few outstanding projects take fair tonnages

of lap weld, mostly direct mill shipments.

While buying of alloy tubing by the aircraft industry continues brisk, several industries normally accounting for large tonnages are restricted by stop or limitation orders, notably the furniture and bedding users.

Heavy demand for cast pipe prevails for government installations, but municipal buying is held down by inability to secure high enough ratings, while utility purchases are limited to special jobs. Pig iron allocations to pipe foundries prohibit the building of normal reserve stocks, allotments to the largest consumers this month being reduced 5 per cent. On the Pacific coast cast pipe demand for governmental projects remains unabated, heavy tonnages being placed.

Wire

Wire Prices, Page 95

While some wire producers are entering orders with A-1-a ratings, no definite promise is made as to delivery and the bulk of new volume is in the higher AA brackets; shipments against the latter tend to lag behind schedule. Production schedules are restricted by limited rod supplies, lend-lease draining off considerable semi-finished tonnage badly needed by finishing departments. Integrated mills are losing rods to independent producers with high priorities, although the latter are taxed to secure tonnage to maintain more important war contract deliveries. Bookings continue heavy with increased releases against forward orders.

Eastern operations are spotty, some finishing equipment being down while other departments are producing at capacity. Low carbon flat demand is slack, high carbon rounds making up the bulk of buying with a substantial volume of alloy specialties appearing, notably for aircraft. Heavy demand continues for rope wire, especially finer sizes.

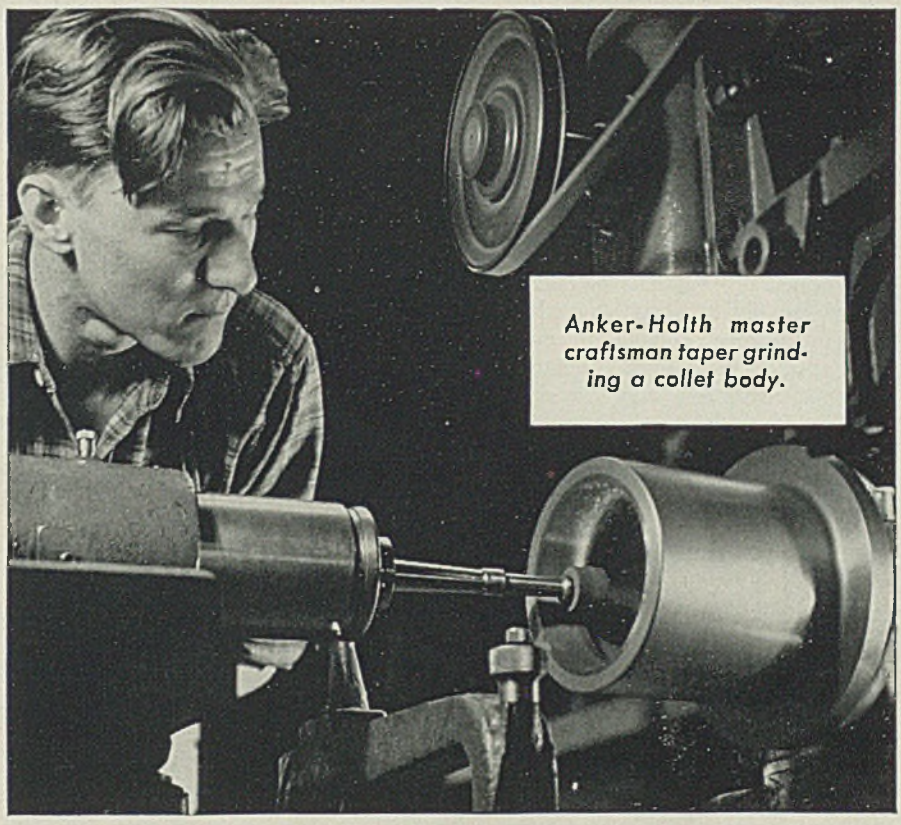
Structural Shapes

Structural Shape Prices, Page 95

Although nearly 1,000,000 tons of structural shapes was rolled in June and July, easing of the tight supply situation has not developed. Sustained deliveries to shipyards and miscellaneous fabrication for war equipment have taken up much of the slack caused by a decline in general building and engineering demand.

Most structural projects left on the books have been re-rated when necessary and revisions have retained most tonnage considered active, although a synthetic rubber plant in the Midwest has been withdrawn. Substantial volume of the work slated to be halted was dropped some weeks back.

AA-3 is needed for structural mate-



Anker-Holth master craftsman taper grinding a collet body.

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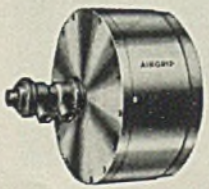
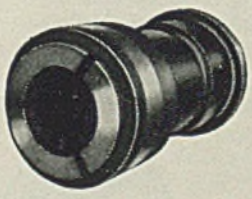
Anker-Holth "Airgrip" Chucking devices are precision made by master craftsmen. Built into every air cylinder and chuck are—long life and efficient operation, which assure lower cost and faster production.



Double ball bearings in Model D Anker-Holth revolving air cylinders reduce friction to the minimum and permit speeds heretofore impossible.

Heavier cuts, courser feeds and faster production are attained with Anker-Holth "Airgrip" Chucks. Work may be chucked or released without stopping the machine.



Anker-Holth makes a complete line of expanding arbors and collet chucks for projectiles from 20 mm. up to 155 mm. At left—155 mm. collet chuck.

Other Anker-Holth products: Revolving cylinders for feeding bar stock through spindle; three-jaw universal chucks; special "Airgrip" arbors; parallel grip collet chucks; operating valves; and, air filter, automatic lubricators, and regulating valves. Also, hydraulic cylinders.

Wire, or phone, for shipping dates!

Anker-Holth Mfg. Co.

"AIRGRIP" CHUCK DIVISION

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rial for some shops, but under the mill quota plan one large producer can supply jobbers within quotas on A-1-b and another on A-1-e; such ratings are too low, however, for specified work scheduled through fabricating shops.

Fabricators in the Middle West are alarmed over their current situation. Not only have prospects for new work practically dried up, but it is getting more difficult to obtain plain material from mills in sufficient volume to complete work already on contract. It has been many years since new inquiry was as low as at present.

A large prospective tonnage evaporated Aug. 18 when the government deferred construction on the new $90,000,000 synthetic rubber plant in Gary, Ind., on which work already had started and one structural inquiry for 1200 tons issued. Thus far, fabricating shops have not been more than mildly successful in lining up subcontract war work, so that prospects for keeping facilities occupied after turn of the year are not good.

Fabricators of structural shapes, as well as plates and bars, were given a formula last week by OPA for determining maximum prices when such prices cannot be established under section 2 of the General Maximum Price Regulation. The formula requires use of the same cost factors and the same method the fabricator would have used in March, 1942, in determining prices.

Reinforcing Bars

Reinforcing Bar Prices, Page 95

Allotments to concrete bar mills under the PRP and mill quotas system have been sharply reduced in most instances and considerable lower rated volume carried before priority revisions has been cancelled. Open spots in capacity are being filled with shell rounds frequently. Mills as a rule require AA-1 or AA-2 for larger diameters. On smaller sizes, one-inch and under, some deliveries are possible on A-1-a, also for bar shapes, with AA-1 or AA-2 needed for bar flats. Demand for reinforcing steel is slackening materially.

Prospects for new business in the Chicago area are regarded the poorest in many years. From this point on, it appears that business will consist entirely of new war plants and expansions of old ones—tonnages which come up suddenly, carry high priority, and are disposed of quickly.

Deferment on Aug. 18 of construction of a $90,000,000 synthetic rubber plant in Gary, Ind., on which work already has started, removed at least 10,000 tons of bars from the current picture. Of this, 3000 tons already had been awarded and the balance was near closing. One Chicago producer of bars finds that its orders carrying AA-4 and higher ratings practically usurps the September allotment.

Tin Plate

Tin Plate Prices, Page 95

Pittsburgh reports tin plate production is sliding along at a gradually reducing rate, will probably fail to meet the expected third quarter output and faces a fourth quarter of consistently lower operating rates. This is not due to inability to produce, but because demand is falling off to levels below those expected. The closing of hot tin mills recently is one surface indication of this condition, which may create serious problems in employment before the year is out.

Lower lend-lease quotas plus domestic limitations are responsible for the situation. In order to level out production somewhat, a portion of 1943 needs may be pushed up to round out fourth quarter output and stabilize employment. Work on electrolytic lines is being pushed, although material delays have extended the construction period and delayed the start of production on these units, which are expected to provide a large part of the 1943 needs.

Modern production facilities combined with experience and complete laboratory research and tests, enable Jessop to produce quality tool, die and specialty steels. These steels are made in electric furnaces of the newest type in which alloys of a number of elements can be added and controlled within close limits. Inherent and apparent grain size can be controlled and soundness and purity maintained at higher levels than ever before. Important, too, is our highly trained field staff which is cooperating with users and helping them to meet the insistent demands for more steel.

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CARBON · HIGH SPEED · SPECIAL ALLOY · STAINLESS · COMPOSITE STEELS

Pig Iron

Pig Iron Prices, Page 96

New formula for calculating ceiling prices on pig iron delivered all-rail from Buffalo to points which before the war moved by barge or barge and rail was announced last week by OPA in amendment No. 2 to Revised Price Schedule No. 10.

The amendment is designed to afford relief to Buffalo producers selling pig iron to consumers on the eastern coast. Formerly this pig iron moved over the New York State Barge Canal. Under ordinary circumstances stocks were built up at eastern points during the summer months and were drawn upon during the winter season when the canal was frozen. Allocation of pig iron made the building up of such stocks impossible and necessitated that the iron be moved all-rail.

Under the new formula, the producer arrives at his maximum price by taking the sum of:

1. The basing point price at the governing basing point;
2. Any allowable differentials;
3. The usual transportation charges from the basing point to the point of delivery; and
4. The amount by which the all-rail freight rate exceeds the charges for barge or barge and rail transportation to the place of delivery.

Inventories of pig iron in New England are in good balance and allotments leveled off evenly on a monthly basis. What few changes occur in aggregate tonnages are upward due to fluctuations in war contracts. More and more tonnage is included in the higher priority brackets. WPB is also stressing that applicants for iron use allocation classification symbols in addition to giving group classification data.

Two consumers of basic in southern New England are paying slightly heavier prices on this grade over the Everett base, additional charges being allowed shippers on dislocated tonnage. In one case this amounts to 89 cents a ton and in another $1.39.

Buffalo producers report the delay in shipments due to car shortages has cleared. but considerable complaining is heard about the obsolete rail equipment being used. Sellers claim some cars, after they are loaded, break down before leaving the yards. With gondola cars growing more scarce, almost any style car is being pushed into service.

Iron Ore

Iron Ore Prices, Page 97

Iron ore consumed by blast furnaces in the United States and Canada during July totaled 7,175,845 gross tons, compared with 7,033,584 in June, according to the Lake Superior Iron Ore Association. In July, 1941, consumption was 6,497,442 tons.

Cumulative consumption to Aug. 1 was 49,116,562 tons, against 43,178,525 tons in the comparable 1941 period. Iron ore on hand at docks and furnaces Aug. 1 totaled 37,326,533 tons, compared with 30,930,991 tons July 1, and 31,597,386 a year ago. Of the total on hand Aug. 1, United States furnaces held 32,194,806 tons and Canadian furnaces 1,093,974 tons. Stocks at Lake Erie docks in the United States amounted to 4,037,753 tons.

As of Aug. 1, blast furnaces active in

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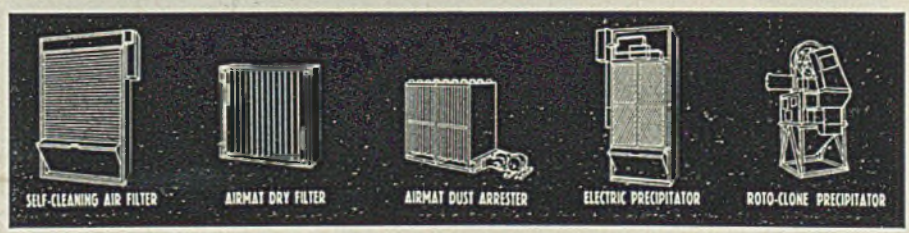


the United States numbered 172, unchanged from the previous month, and two higher than a year ago. Canadian stacks numbered nine, the same as one month ago, and three higher than the total Aug. 1, 1941. Total stacks active numbered 181, the same as one month ago and a gain of five from a year ago.

Warehouse

Warehouse Prices, Page 97

Demand in excess of ability to supply continues to confront steel warehouses, allocations and higher priority ratings notwithstanding. The situation has been aggravated by the fact that warehouses are obliged to sell against much lower ratings than they are able to use in replenishing stocks. With mill production almost usurped by AA-1, AA-2 and AA-2X ratings, below this are unable to command much steel, thus direct allocations by WPB appear to be the only hope for distributors. Receipts of the NE steels have been disappointingly light, and further delay is anticipated since many of the grades will be superseded by the new NE 9400 series.

Scrap

Scrap Prices, Page 98

Receipts of iron and steel scrap at principal collection points continue to fall off and there is some anxiety, despite reports of reasonably adequate stocks in the hands of large consumers, that surplus accumulation will not attain sufficient volume to tide over the difficult fall and winter months.

Some dealers and brokers are convinced that collection has been slowed by exhaustion of sources, that current campaigns to uncover new supplies are being handicapped by success of earlier appeals. Yet it is conceded that allocations may clarify the situation and prove them wrong.

While the government-sponsored scrap campaign to date has not developed any great volume of loose industrial or miscellaneous material, some betterment is anticipated as its scope is broadened. Passing of the peak harvest season on farms should also bring out additional supplies. Reports on the drive from the Midwest indicate that it is taking hold in excellent shape, several counties in Missouri and southern Illinois having already exceeded their allotted quotas. Farmers are being offered cash prizes for the largest tonnage brought in.

Current backlogs are described as "comfortable" in the Pittsburgh district, and as slightly more than sufficient for present demands in other major steelmaking centers. Although capacity in these areas is great, the percentage of bessemer steel and of the duplexing process is relatively higher, proportionately reducing the need for scrap. However, this factor, added to the large supply of "home" scrap available, does not offset the need for a sufficient supply for the winter months.

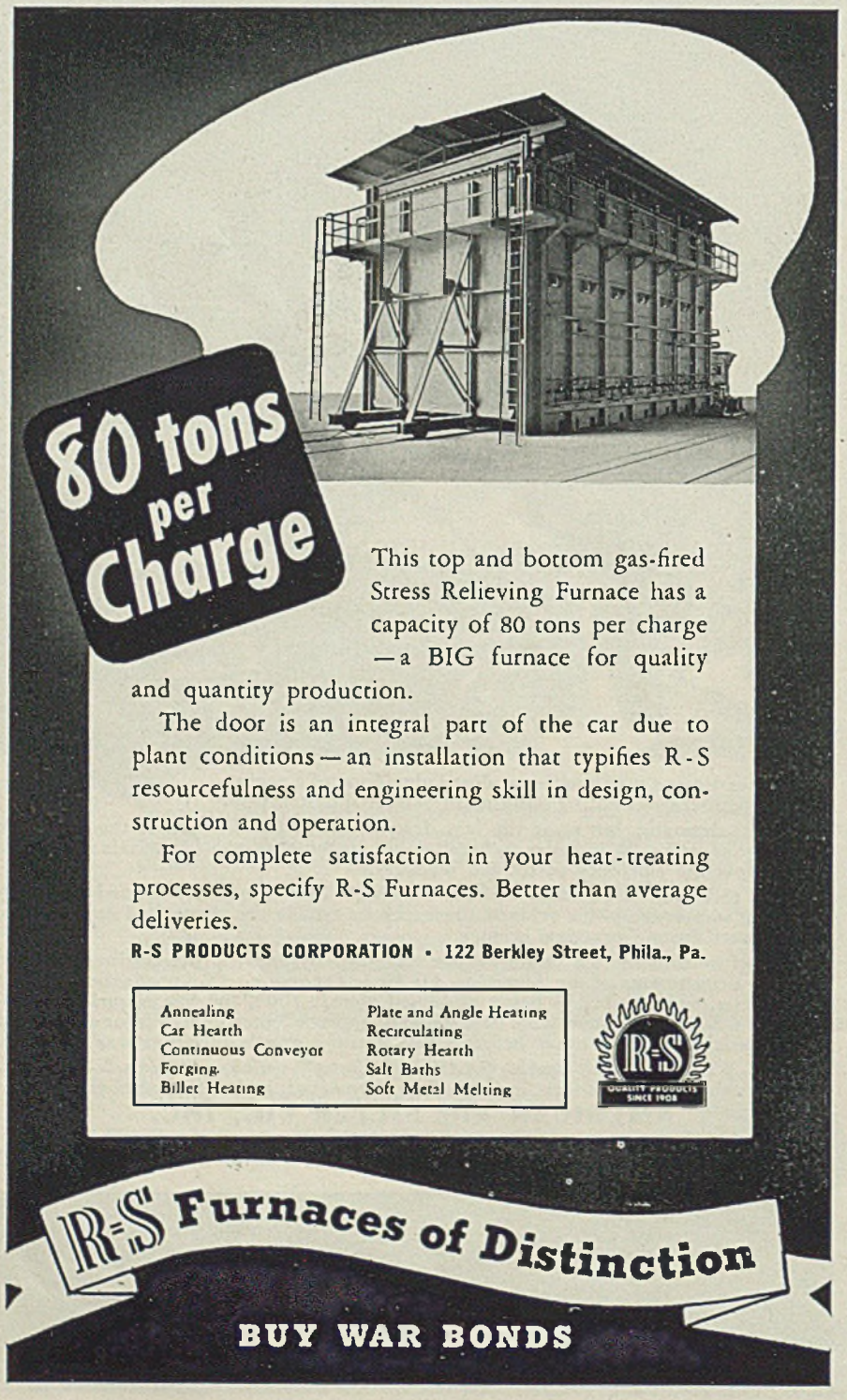
"Junkies" are not gathering even normal quantities of material for eastern yards, and it is this function which community scrap drives must supplement. On the brighter side, there is still the hope that if regular collection days are established, much idle material will eventually find its way to market. Material is flowing from auto wreckers in about the same volume, but cars to demolish are growing scarcer. Junk yards are having serious difficulties with labor, not being able to compete, so they claim, with rates of pay in war-geared industries.

Receipts of boat scrap at Buffalo for the season to date aggregate approximately 190,000 tons, and some consumers have been able to show some improvement in reserve stockpiles in the past week or ten days. Some interests have increased reserve stocks. Increased tonnage from heavy industrial plants in the area is said by yard operators in the district to be counter-balancing a slackening in pickups from non-recurring sources.

Salvage operations by railroads are producing fair results. One road is taking up track sections used to reinforce paving in numerous St. Louis street crossings. It is thought this effort will produce about 1100 tons. Illinois Central railroad is removing 500 tons of rails from a 4-mile stretch of abandoned track for conversion into new rails.

Pacific Coast

Seattle—Pacific American Steel Iron Corp., incorporated in May, is seeking a $50,000,000 government loan for development of ore properties and construction of a steel mill in this area. One of the promoters is Henry J. Landahl, of Bellingham and Vancouver, B. C., who appeared recently before a Senate committee to say that "big steel interests" had frustrated previous efforts to



establish a steel plant here. Officers of the company claim they have expended $600,000 on engineering and research and state they have options on iron, lime and coal properties on Vancouver Island and in Western Washington, all close to tidewater and easily transported.

While local steel mills, consuming 20,000 tons of scrap monthly, have sufficient inventories on hand for present needs, the future is viewed with some apprehension. State salvage officers are stepping up collection of metal scrap. Seattle residents are requested to put out their scrap on Aug. 30. A fleet of 1000 trucks will pick it up. All are asked to aid in what the committee in charge calls a "critical situation."

Washington state has sold 360 tons of stringers and other salvage from the Narrows bridge to Alaska Junk Co., Portland, for $24,908 and 45 tons of materials to Riverside Junk Co., Everett, for $3165. J. P. Murphy and Woodworth & Co., Tacoma, asked cost plus a fixed fee of $69,900 to dismantle the towers and cables of the structure. The first bid, total, was $450,000.

United States engineers at Seattle and Portland have awarded numerous contracts for military installations in Oregon, Washington and Idaho, several of them running over $1,000,000 each. These include barracks, storehouses, treatment plants, shops, water and electric systems, gas and fueling systems and other facilities.

Seattle's proposed raising of Ross dam, Skagit project, is temporarily stymied because of priority angles. General Construction Co., Seattle, Morrison & Knudsen and J. F. Shea submitted the joint low bid of $6,146,214. S. Morgan Smith, York, Pa., was low at $17,800 each for two 72-inch valves and $11,050 each for two 48-inch valves. No bids were received for sluice gates. The job involves 550 tons reinforcing.

Washington state has granted Defense Plant Corp. the use of 18,734,000 gallons of water daily from the Spokane river for the cooling process at the Spokane aluminum plant.

Morris Schnitzer, president, Oregon Electric Steel Rolling Mills Inc., announces his firm has a 48-acre river site in Portland on which it is proposed to erect a plant to use scrap. It is stated that WPB has approved the project which will cost $1,000,000 and involve one electric furnace, capacity 30,000 tons annually of light sections and bars. Plans are in the making for a second furnace.

H. G. Iverson, district engineer at Portland for Bureau of Mines, urges owners of usable mining and milling machinery not to sell their equipment for scrap. He will conduct a survey in this area to locate second-hand equipment to meet demands for increased production of metals.

The logging and lumber industry is facing a critical shortage of labor, due to the draft and higher wages in other lines. Government is making a survey and it is stated troops may be sent into the woods. To assist in producing airplane spruce, the government will finance 30 miles of logging roads, for trucks, into the Olympic Peninsula, Washington.

For the Nisqually project, Tacoma has awarded a 120-inch butterfly valve to Pelton Waterwheel Co., San Francisco, at $45,000, and S. Morgan Smith, York, Pa., at $34,675 for two 66-inch gate valves. Bids were opened Aug. 19 for caterpillar gate and house for La Grande tunnel. Tacoma will open bids Sept. 2 for 200-ton bridge crane for La Grande power house. United States engineer, Portland, received bids Aug. 21 for a 12-ton, 167 horsepower diesel whirley.

Port of Seattle has a $2,800,000 federal grant for construction of the Connecticut street terminal pier, to which the Port will furnish $1,960,000.

Kaiser Co. announces 55,000 additional workers will be required by Jan. 1 in that firm's three shipyards near Portland. Wegman & Son, Portland, has the contract to build an oxygen plant at the Kaiser Swan Island yard similar to one recently erected at Vancouver.

By November, it is stated, Coulee will have two additional 75,000 kilowatt generators in production, these diverted from the Shasta dam to speed war industry effort in this area. Meanwhile Paul J. Raver, Bonneville administrator, is demanding action at the second unit of the Troutdale aluminum plant, reported to be handicapped by a labor shortage.

Canada

Toronto, Ont.—Not only is the Canadian government taking action towards reduced consumption of steel in nonessential industry, but is taking direct steps leading to sustained and increased pro-

KEEP IN STEP WITH OUR FIGHTING FORCES

● With an Army on the offense—all men and all units must advance according to plan. The same is true in the production of essential war machines and materiel. All steps must be synchronized for maximum output.

Alloy castings—whether pots, boxes, retorts,—muffles, tubes, rails, rolls, shafts,—can do their part for you in maintaining your production objective—if you can count on them for uniformly high heat-hour service.

MICHIANA has concentrated all effort for 24 years in the specialized field of heat- and corrosion-resistant alloy castings. MICHIANA Alloys have made performance records in a wide field of application. MICHIANA has the experience, the facilities, and skill to take care of your needs and help toward maintaining the quality and amount of your output.

MICHIANA PRODUCTS CORPORATION, Michigan City, Indiana

- Muffles
- Boxes
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- Pots
- Grids
- Tubes

MICHIANA Heat-Resistant and Corrosion-Resistant ALLOY CASTINGS

- Sprockets
- Chains
- Heat-Resistant and Corrosion-Resistant Castings of All Kinds

duction of steel in Canada. One of the vital concerns with regard to steel output, is the supply of iron and steel scrap and the Steel Controller has issued a new order which prohibits any company or individual holding scrap in excess of 500 pounds, other than a dealer or consumer. To date, however, there has been no actual shortage of scrap in this country requiring curtailment of steel production. Canadian steel mills now are operating close to 100 per cent capacity.

Merchant bar demand is increasing rapidly and it is stated that some mills have stepped up operations in bar mills recently to meet additional war needs. So far most requirements of carbon bars have been provided by Canadian mills, but heavy imports have been necessary to supply users of stainless and alloy steels. Work is being rushed on several plant additions directed toward greater output of stainless and alloy steels, and it is hoped to have this additional capacity available by the end of the year.

While there was a minor lull in structural steel lettings couple of weeks ago, inquiries increased in the past few days and awards rose to close to 12,000 tons for the week. New war plant constructions and plant additions are responsible for practically all fresh business in the structural markets. Fabricators report continued piling of backlogs and are operating at capacity to provide steel for special war jobs.

Shortage of wire and nails is becoming more acute and recently a large number of users have been forced to cancel some activities because they are unable to purchase these materials. Wire mills, mostly, are operating at only a small percentage of capacity through lack of steel, and action has been taken to curb production of many lines of wire and wire nails.

While there has been some slowing down in offerings of iron and steel scrap materials recently, chiefly due to falling off in shipments from rural districts, it is stated that in some sections around Toronto there are fairly large accumulations that so far have been given no attention, particularly on the farms. Through shortage of farm labor, many farmers have not had an opportunity to seek out their scrap and pass it along to dealers or collectors. It is expected, however, that these stocks will be cleaned up as soon as the crops are off and will result in something of a flurry later in the year.

Metallurgical Coke

Coke Prices, Page 95

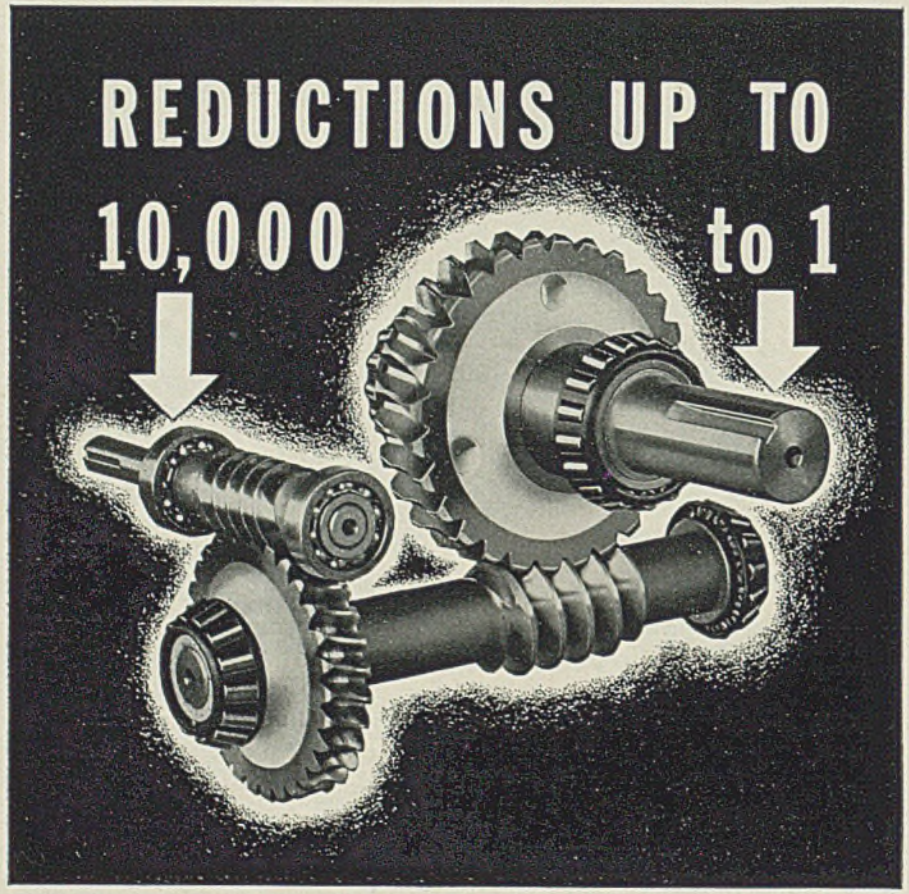
The 50-cent increase in the ceiling on Pennsylvania beehive furnace coke has brought with it several problems as yet unanswered. Some of the West Virginia operators are wondering why they were left out of the increase. Some sellers of foundry coke are watching for effects on their business. Operators who had exceptions granted have not found out the exact status of their special prices. The whole trade is waiting to see if the higher price will reactivate any more ovens.

West Virginia operators were eliminated from the ceiling increase because it was specifically limited to Pennsylvania coke. Some sellers of West Virginia coke are understood to be preparing a petition to ask OPA to extend the provisions of the order to cover their material, on the premise that the same conditions exist which caused the 50-cent increase in Pennsylvania.

Shippers of foundry coke, which is ceiled although at a higher level than furnace coke, are hoping for an increase in demand for their product from foundries which have been using beehive furnace coke because of the price differential. Now that the spread between the two grades has been narrowed, sellers of foundry coke expect the better quality of their product will bring in more business. Normally, foundry coke is burned longer in the ovens than is furnace coke, resulting in a better analysis for foundry use, but increasing the cost. Because of declining business, many foundries have switched over to furnace coke in order to cut material costs.

Exceptions to the price ceiling on furnace coke, granted before the general increase, varied from 25 cents to 55 cents above the ceiling price. As yet there has been no clarification of prices for these ovens, although it is assumed by sellers here that the operator is free to use the ceiling price if it is higher than his exception. There seems no foundation for the rumor that the exceptions apply to the new ceiling.

There are still some inactive ovens in the Connellsville district which might be reactivated under the new ceiling. It has been assumed that these ovens were not lit because their costs were too high to operate economically at the $6 level. However, it is not certain that there would be a market for such coke at the $6.50 level as present production has been satisfying demand fairly well.



HORSBURGH & SCOTT Worm Gear Speed Reducers are available in ratios from 3⅝ up to 10,000 . . . a most complete line of eight different types. These reducers are noted for their long life records of service and here's why . . . Simple in design . . . Heavy, wide face gears—accurately cut . . . Anti-friction bearings . . . Heavy, dust-tight housings . . . Oversize shafts and bearings . . . Efficient lubrication.

Send note on Company Letterhead for Speed Reducer Catalog 39

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE • CLEVELAND, OHIO, U. S. A.

Nonferrous Metal Prices

Aug.	Copper Electro, del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
1-20	12.00	12.12½	11.75	52.00	52.00	6.50	6.35	8.25	15.00	14.50	35.00

F.o.b. mill base, cents per lb. except as specified. Copper and brass products based on 12.00c Conn. copper

Sheets

Yellow brass (high)	19.48
Copper, hot rolled	20.87
Lead, cut to jobbers	9.75
Zinc, l.c.l.	13.15

Tubes

High yellow brass	22.23
Seamless copper	21.37

Rods

High yellow brass	15.01
Copper, hot rolled	17.37

Anodes

Copper, untrimmed	18.12

Wire

Yellow brass (high)	19.73

OLD METALS

Dealers' Buying Prices
(In cents per pound, carlots)

Copper

No. 1 heavy	9.25-10.00
Light	7.25- 8.00

Brass

No. 1 composition	8.00- 8.25
Yellow brass castings	5.50- 5.75
Auto radiators	6.25
Red Brass, borings & turnings	7.75- 8.00

Zinc

Old	4.75
New clippings	6.00- 6.25

Aluminum

Clippings	9.50-10.00
Cast	8.50- 8.75
Pistons	8.50- 8.75
Sheet	9.00

Lead

Heavy	4.75- 5.00
Mixed babbitt	4.50- 5.25
Electrotype shells	5.00- 5.75
Stereotype, Linotype	6.25- 7.00

Tin and Alloys

Block tin pipe	44.00-46.00
No. 1 pewter	32.00-38.00
Solder joints	7.75-10.00

SECONDARY METALS

Brass ingot, 85-5-5-5, l.c.l.	12.50
Standard No. 12 aluminum	14.50

MAGNESIUM

(12 pound rod, 4 in. diam.)

99.8% ingot, carlots	22.50
100 lb. to carlots	24.50
Extruded sticks, ¼ to 2 lb.	
Carlots	32.00
100 lb. to carlots	34.00

Nonferrous Metals

New York—While supplies of lead have continued to increase steadily, due to large imports coupled with restrictions on use, those of aluminum, copper and zinc remain tight. WPB tightened restrictions last week on the use of aluminum while the War Department issued a new "List of Prohibited Items for Construction Work" which reduces components of critical materials to a minimum. Restrictions continue severe on copper, zinc, lead and aluminum, while chromium, magnesium and nickel are virtually barred.

Order M-1-i, revoking orders M-1-e and M-1-f, bans use of aluminum by the armed services for all but "implements of war." The order restricts use in some less essential military purposes to make larger supplies available for combat items; defines "low-grade" aluminum as aluminum containing more than 4 per cent copper and either iron or zinc in excess of 1 per cent; provides that all requests for allocation are to be made on form PD-26; and makes other changes in the control program.

OPA issued revised price schedule No. 2 to cover all grades of aluminum scrap and secondary aluminum ingot. It effects a reduction of about one cent per pound on most grades of scrap and establishes ingot prices on a modified carload, freight allowed basis.

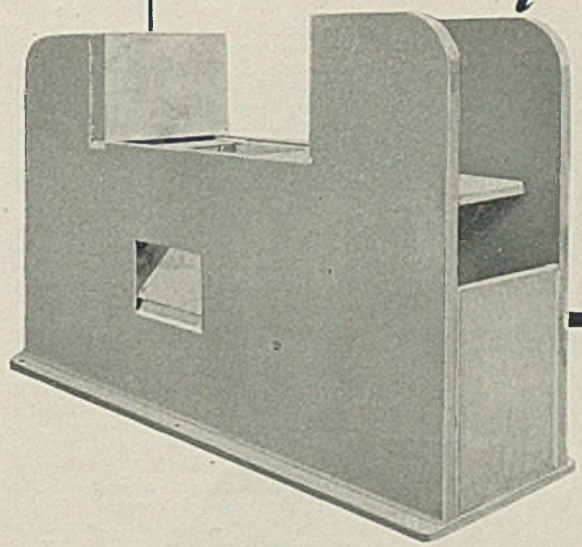
Convention Calendar

Sept. 9-11—American Institute of Electrical Engineers. Pacific Coast convention. Hotel Vancouver, Vancouver, B. C. H. H. Henline, 33 West 39th street, New York, is, secretary.

Sept. 11-17—American Chemical Society. Semiannual meeting, Hotel Statler, Buffalo. Dr. Charles L. Parsons, 1155—16th street, Washington, is secretary.

Sept. 29—Oct. 2—American Institute of Steel Construction. Twentieth annual convention at Broadmoor hotel, Colorado Springs, Colo. V. Gilmore Iden, 101 Park avenue, New York, is secretary.

Welded by Graver for STRENGTH-ACCURACY-ECONOMY



Billet descaling frame. Size, 103½" x 61¾" x 33½" overall. Approximate weight, 11,050 lbs.

IN the manufacture of machinery bases, frames, and other equipment, the advantages of Graver Welded Construction are extremely important.

This frame, for instance, welded into a single unit from high quality, hot-rolled mild steel, provides the utmost in strength. Accuracy is assured because unusually close tolerances can be maintained. And since there is no pattern expense, no deadweight, no wasted metal, the finished job shows a decided saving in cost.

When desired, equipment can be fabricated of two or more dissimilar metals such as mild steel, alloy steels, steel castings or forgings, welded together into a one-piece unit.

Graver facilities include the most modern flame-cutting, forming, and arc-welding equipment, and all Graver welders are long experienced in this highly specialized work. In addition, a complete X-raying and Stress Relieving service is available

You'll find it profitable to investigate the many advantages offered by Graver Welded Construction.

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12-19-S

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.

Minneapolis office, Contract Distribution Branch of WPB, 334 Midland Bank building, is seeking contractors for the following:

S.O. No. 261: Eastern manufacturer wants to sublet considerable automatic screw machine work on commutator parts in sizes from ¼ to 2¾ inches. Prints of sample parts available for inspection at Minneapolis office.

S.O. No. 260: Sources needed for manufacture of aircraft engine parts, including valve tappets, studs, piston pins, bushings, etc. Grinding operations required on most parts. Samples on display at Minneapolis office.

S.O. No. 263: Prime contractor seeks facilities for production of 2000 M-102 adapters per day in not more than two plants. Machine tools required for complete quantity, 4 to 5 automatic screw machines, or 6 to 10 turret lathes, or 15 to 20 engine lathes. In order to produce 1000 adapters per day you should have available one half the facilities, of any type, listed above. Prime contractor will make available material, taps, die heads, reamers, gauges, etc., needed for tooling for this work. Work will continue for duration. Part and drawing on display at Minneapolis office.

Philadelphia Office, Contract Distribution Branch, Production Division, WPB, Broad Street Station building, reports the following subcontract opportunities:

Jackson-47-1: A Pennsylvania firm needs subcontractor to supply scalpel forgings. Quantity, 6000, size, 10½ inches long, ⅝-inch wide, ¼-inch thick, weight ½-pound. Material, carbon steel, SAE 1065, to be furnished by subcontractor. Equipment needed, forge hammer, forging dies, trimming dies. A-1-a priority rating.

Keefer-47-1: Pennsylvania firm needs subcontracting facilities for manufacture of base and adapter, 2⅛-inch O.D., length, 1¼-inch, weight, 12 ounces. Forging facilities, turret lathes, and multi-spindle automatic screw machines needed for work. Materials, drop forgings and cold rolled steel, W.D. 1115. Prime contractor can furnish drop forgings if necessary. Quantity, 500 of each per day. Prints, specifications and samples can be seen at Philadelphia office. Various priorities ratings, AA1, AA2 and balance A-1-a.

New York office, Contract Distribution Branch of WPB, 122 East Forty-Second street, New York, reports the following subcontract opportunities:

S-2261: A New York city manufacturer is seeking subcontracting facilities for making large welded steel gun cradles and welded steel rack blanks. Cradle is 11 feet long by 30 x 40 inches, and the job consists first of fabricating and welding, then of machining. One method suggested involves planing end of cradle on planer with bed 11 feet wide. Quantity, 400 each. Machines needed, bridge-type miller, vertical miller, horizontal boring mill, 72-inch vertical boring mill, 4-foot radial drill, large planer, electric welding equipment, rotary welding table, X-ray equipment, magnaflux equipment, stress relieving furnace, sandblasting equipment. Materials to be furnished by prime contractor. Drawings may be inspected at New York office.

D-42: A New York city manufacturer is seeking subcontractors with facilities for making plunger stops for type A flexible ring mount. Material, steel, SAE 1020, will be furnished by prime contractor. Dimensions, 1.6-inch long, .685-inch O.D., ground. Tolerance, plus .000, minus .002. Quantity, 38,000 at rate of 2000 per week. Machines needed, small turret lathe or screw machine. Must be case hardened and ground, allowing .005 to .010 for grinding. Samples and drawings at New York office.

S-1528A: A government procurement agency seeks open capacity for shell case drawing. Machines needed, hydraulic presses having 200 to 500-ton pressure and at least 24-inch minimum stroke up to 60 inches maximum, with pump and accumulators.

D-41: A Brooklyn manufacturer requires subcontractors with facilities for making bronze optical discs. Dimensions (approx.), 4⅞-inch diameter x ⅛-inch thickness. Holes, through 1⅝-inch diameter, thread 1½-inch diameter. Clearance thread class 3, fit 1 center hole ⅛-inch diameter. Quantity, 300 to 400 immediately; may be continued order. Machines needed, engine lathe and attachment. This is part of an optical instrument, and disc must be made precisely plane. Samples at New York City exhibit.

S-173: A New Jersey manufacturer is seeking subcontractors having horizontal boring mills with 4 and 5-inch bars and with tables 62 x 72 inches and over. Tolerances, minus .000, plus .003 and under. 16,000 machine hours needed.

Chicago office, Contract Distribution Branch of WPB, 20 North Wacker Drive, is seeking contractors for the following:

529: Facilities, auto screw machines MS 1-inch, auto chucking or hand screw machines. Material, WDX 1335 steel bar stock. Tolerance, close. Parts, liners for tail fins. Quantity, 210,000 pieces. Production, 30,000 per month. Liner is 6 inches long with both ends counterbored, one end threaded internally, other externally.

413: Facilities, forge hammers for forgings 2¾-inch diameter by 38 inches long, 4½-inch diameter by 5 inches long, 7¾ inches wide by 31½ inches long, 7 inches wide by 8½ inches long. Material, steel. Parts, for 37 MM gun mount M23. Quantity, unlimited. Dies for forgings must also be made up.

410: Facilities, auto screw machines MS 2⅝-inch, chucking machines 2⅝-inch, Material, steel bar stock, forgings. Tolerance, .002. Parts, adapter body for fuse. Quantity, unlimited.

328: Facilities, turret lathes 3A WS, boring machines (deep hole), thread mills, milling machines, external and internal grinders, honing, etc. Material, rough-machined steel forgings. Tolerance, close. Parts, oleo struts for planes. Quantity, unlimited. Production, 50 to 5000 per month. Manufacturers experienced in work of this type will be given consideration even though they do not have all the necessary facilities.

730A: Facilities, auto screw machines up to 3¾-inch, hand screw machines, turret lathes, milling machines No. 1, internal-external and surface grinders, etc. Material, steel bar stock. Tolerance, close. Parts, 800, for aircraft motors. Quantity, unlimited. Production to start in December. Prime will loan some machine tools to qualified manufacturers.

724B: Facilities, milling machines No. 1, drill presses, small drop hammer or punch press. Material, round steel bar stock. Tolerance, .002. Parts, 10, cable eyes and forks for aircraft. Quantity, 1,000,000, production to start at once. Ends must be flattened then gang milled.

724C: Facilities, auto screw machines No. 00, No. 0, No. 2, No. 4 or MS ¼ to 1¼, milling machines No. 1, drill presses. Material, brass and steel bar stock. Tolerance, plus or minus .005. Parts, 8 for M2 fuse. Quantity, 2,000,000 pieces, at rate of 400,000 per month. Production to start between Sept. 1 and 15.

717: Facilities, milling machine No. 3, shaper 24-inch, planer 36-inch, engine lathe 24-inch. Material, steel plate and castings. Tolerance, .002 to .005. Parts, 182, for assemblies. Production at once. This is typical job work.

709: Facilities, auto screw machines MS 1¼ and 2½ inches, internal grinders Heald No. 70-72-75-81, centerless and Blanchard type surface grinders, heat treating. Material, steel bar stock. Tolerance, close. Parts, 4, inner and outer races. Quantity, unlimited, at rate of 200,000 per week. Operations can be done by several firms, if necessary.

709A: Facilities, auto screw machines MS ⅝ to ⅞-inch hex, small milling machines. Material, duronze bar by prime. Tolerance, .002. Parts, 4, fittings. Quantity, 400,000 pieces. Production, unlimited.

709B: Facilities, turret lathes or chucking machines ⅞ to 1⅜ inch. Material, nickel steel forgings by prime. Tolerance, .002. Parts, fittings, 11 different parts. Quantity, 75,000 pieces. Production, unlimited.

703: Facilities, engine lathes 30-inch, gear shapers 18-inch PD 5 DP. Material, steel forgings by prime. Tolerance, .001. Parts, hub for tank transmission. Quantity, 500 at rate of 25 per week. Complete machining preferred but consideration will be given quotations for lathe work or gear cutting separately.

630: Facilities, tool room. Material, tool steel. Tolerance, very close. Parts, contour dies for 30 caliber and 50 caliber bullets. Quantity, 200 to 600 pieces at rate of 50 to 100 per week. Dies approximately 1-inch diameter by 1¾-inch long with contours reamed or hob pressed in center. Two-hundred ton hydraulic press required if hobbing method is used. Engineering data and help available from prime.

624: Facilities, automatic screw machines MS 7/16-inch to ⅝-inch hex. Material, X1315 steel bar stock. Tolerance, No. 3 fit. Parts, for special hex. nuts. Quantity, unlimited. Production, up to 50,000 daily.

626: Facilities, automatic screw machines MS ⅝-inch or No. 00 Brown & Sharpe. Material, Moly tungsten ground bar stock by prime. Tolerance, .0015 concentricity. Parts, 30 caliber bullet cores. Quantity, unlimited. Production, 600,000 per month. Battery of automatics preferred. Consideration will also

be given to single purpose machines developed for bullet cores.

Detroit office, Contract Distribution Branch, Production Division, WPB, Boulevard building, is seeking contractors for the following:

Job No. 1931: Bogie link, for gudgeon. Local prime contractor desires forging source. No machining required. Material, W.D. No. 4140 steel, and is furnished. Size, 18 x 11 x 5½ inches, weight, 75 pounds. Requirements, 1500 forgings per month on immediate production. Priority, A-1-a.

Job No. 2136: Primer head. Material, commercial brass rod, half hard (comp. B). Raw material is furnished. Screw machine, ⅝-inch O.D., chucking machine or 1 spindle H.D. drill with 3 spindle drill head and 4 station fixtures. Deliveries to start in 60 days on quantities of 500,000, 1,000,000 and 2,000,000. Priority, A-1-a.

STRUCTURAL SHAPES .

SHAPE CONTRACTS PENDING

1075 tons, bridge superstructure, French Broad river, Dandridge, Tenn.; bids to Tennessee Valley Authority, Knoxville, Tenn. Proj. 20-4081.

1600 tons, boiler house, General Electric Co., Pittsfield, Mass.

1200 tons, powerhouse, synthetic rubber plant, West Gary, Ind., for Synthetic Rubber Inc.; Stone & Webster Engineering Co., contractor; bids Aug. 3; project deferred.

155 tons, state steel girder bridge, Thurston county, Washington state; bids to Olympia Sept. 1; state will furnish 140 tons.

SHAPE AWARDS COMPARED

	Tons
Week ended Aug. 22	00,000
Week ended Aug. 15	10,400
Week ended Aug. 8	2,237
This week, 1941	25,160
Weekly average, 1942	21,931
Weekly average, 1941	27,284
Weekly average, July, 1942	7,708
Total to date, 1941	982,339
Total to date, 1942	723,727

Includes awards of 100 tons or more.

REINFORCING BARS . .

REINFORCING STEEL AWARDS

426 tons, building 208, Rock Island Arsenal, Rock Island, Ill., for War Department, to Inland Steel Co., Chicago; Priester Construction Co., Davenport, Iowa, contractor; bids Aug. 7.

305 tons, glider school, Alliance, Nebr., to Ceco Steel Products Corp., Omaha, Nebr.

250 tons, housing project, Chicago, to Calumet Steel Co., Chicago.

250 tons, addition, A. O. Smith Corp., Milwaukee, to W. H. Pipkorn Co., Milwaukee; Siesel Construction Co., Milwaukee, contractor.

125 tons, housing project, Chicago, to Calumet Steel Co., Chicago.

116 tons, transfer ways, Seneca, Ill., for Chicago Bridge & Iron Co., to Concrete Steel Co., Chicago; Schless Construction Co. Inc., Chicago, contractor.

REINFORCING STEEL PENDING

1250 tons, Bureau of Reclamation, Invitation B-33, 131-A-2; Coram, Calif.; bids opened.

92 tons, bridge across French Broad river, Dandridge, Tenn.; bids to Tennessee Valley Authority, Knoxville, Tenn.

CONCRETE BARS COMPARED

	Tons
Week ended Aug. 22	1,472
Week ended Aug. 15	6,208
Week ended Aug. 8	19,225
This week, 1941	21,523
Weekly average, 1942	9,578
Weekly average, 1941	13,609
Weekly average, July, 1942	11,878
Total to date, 1941	432,202
Total to date, 1942	316,069

Includes awards of 100 tons or more.

PIPE . . .

STEEL PIPE PLACED

400 tons, welded pipe, gas line, Inland Steel Co., Indiana Harbor, Ind., to A. O. Smith Corp., Milwaukee.

CONSTRUCTION AND ENTERPRISE . . .

Michigan

DEARBORN, MICH.—J. A. Utley Co., general contractor, Royal Oak, Mich., is taking subcontracts for aluminum foundry to be located at the River Rouge plant of Ford Motor Co. here.

DETROIT—Ebert Engineering & Tool Co., 2165 General Motors building, has been incorporated to deal in dies and tools and act as consulting engineers. David U. Rosin, 1250 Penobscot building, correspondent.

DETROIT—Metal Cutting Tools & Mfg. Co., 2230-40 National Bank building, has been incorporated with $10,000 capital to manufacture tools, dies, fixtures and machinery. Correspondent, Paul W. Seiler, 27404 Drake road.

DETROIT—Embassy Tool & Mfg. Co., 4458

A YEAR AGO HE SHOUTED: "PAGE FOR WIRE"

Now he adds: "FOR AMERICA AT WAR"

• • • — **PAGE WIRE** for rifles, tanks, balloon barrages, airplane controls, mine sweepers, communication systems and for a host of other war equipment.

• • • — **PAGE WIRE,** in one form and another, for plants that produce equipment and materials vital to Victory.

Such demands drive production to capacity, slow deliveries, even on high priority ratings.

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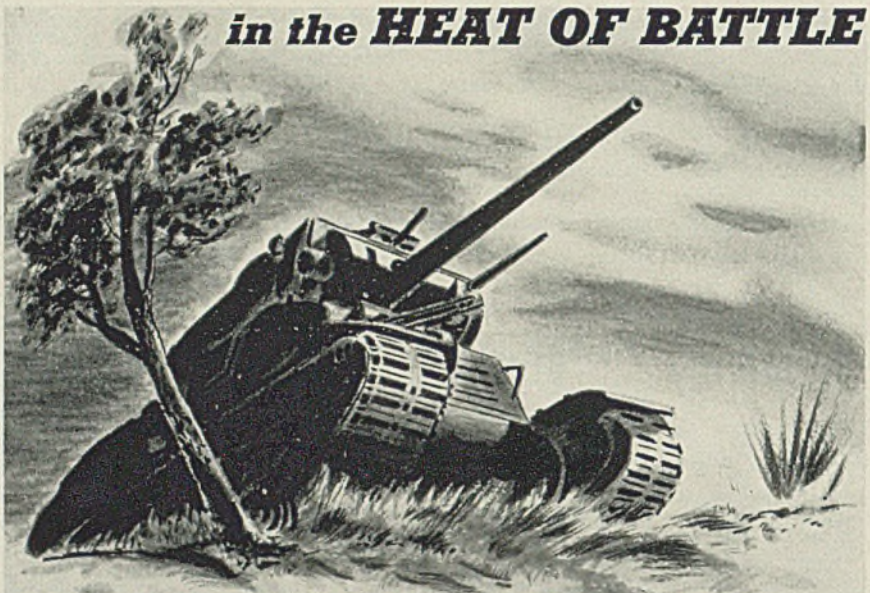

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DETROIT—Albert A. Albrecht Co., Detroit, has been awarded contract for alterations to Cadillac Motor Car Co. plant at 2860 Clark avenue. Estimated cost $35,000.

DETROIT—Trowell Construction Co., general contractor, is awarding subcontracts for factory at Elmira and Decatur streets for Lincoln Sheet Metal Co.

DETROIT—Subcontracts are being awarded by Louis Cantor Co., general contractor, for $40,000 factory of Jefferson Tool & Gauge Co., to be located at 269 Walker street.

DETROIT—Austin Co. has contract for the Ideal Tool & Die Co.'s plant to be built at 13522 Foley street.

DETROIT—Albert A. Albrecht Co., Detroit contractor, has been awarded contract for Pere Marquette railroad's diesel engine house here.

DETROIT—Packard Motor Co. will ask new bids for alterations to its aluminum casting and polishing plant at 1580 East Grand boulevard.

DETROIT—Myles Standish, Detroit, has been awarded general contract for addition to the factory of Northern Engineering Co. at 2615 East Atwater.

DETROIT—W. E. Wood Co. has contract for an X-ray room and addition to the Briggs Mfg. Co. plant at 11631 Mack avenue.

DETROIT—Standard Die & Die Casting Co., 9281 Freeland street, has let contract to Campbell Construction Co. for alterations and extensions to its factory and office building.

DETROIT—Industrial Construction Co. has contract for alterations to factory of Knight Screw Products Co. at 7401 Lyndon.

DETROIT—Carl R. Habermas, Detroit architect, is preparing plans for factory to be located in East Detroit.

GROSSE POINTE, MICH.—Frank Stratton Co., contractor, Grosse Pointe, has awarded steel contract to Gaulin Iron Works for the Radius Tool & Die Co. factory to be located at Buffalo and Prescott streets.

MARYSVILLE, MICH.—Detroit Edison Co., 2000 Second avenue, Detroit, is expanding steam-electric generating station here with installation of 75,000-kilowatt turbine generator and auxiliary equipment.

MONROE, MICH.—H. E. Beyster Corp., Detroit architect, has completed plans for airplane parts plant to be erected here for Republic Aircraft Products Division of Aviation Corp. of America.

MUSKEGON, MICH.—Consolidated Construction Co., Chicago, is low bidder for construction of Continental Aviation & Engine Corp.'s aircraft engine factory here. F. H. Martin Construction Co., Detroit, has contract for the engine testing building.

Massachusetts

SALEM, MASS.—Atwood & Morill, 48 Loring avenue, has awarded contract for one-story factory to Walsh Construction Co., 119 Webb street. Estimated cost $40,000.

Connecticut

GLENBROOK, CONN.—Laminated Shim Co. Inc., C. N. Aborn, president, has let contract to Vuono Construction Co., Stamford, Conn., for factory addition costing $40,000. (Noted Aug. 17).

MILFORD, CONN.—Elliott Mfg. Co., 347 New Haven avenue, will spend about $40,000 for factory addition.

New York

BUFFALO—War Production Board, Washington, plans to build a detinning plant here which will have annual capacity of 60,000

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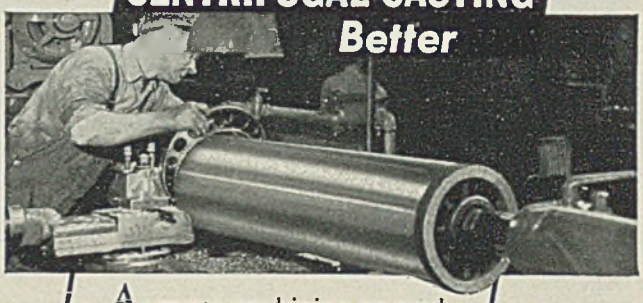

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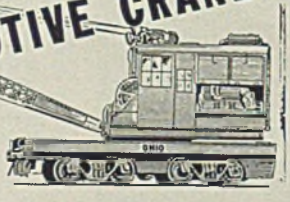

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tons of steel. Defense Plant Corp., in charge of construction of proposed plant, has let contract to H. K. Ferguson Co., Hanna building, Cleveland.

JAMESTOWN, N. Y.—Jamestown Aeronautical Corp., care of F. C. Pickard, Jamestown Sterling Co., Jamestown, has plans by Beck & Tinkham, Bailey building, for plant costing $25,000.

JAMESTOWN, N. Y.—J. P. Danielson Co. Inc., 583 Allen street, has let contract for one-story 50 x 300-foot plant addition to L. H. Ludwig Co., 20 West Main street, Falconer, N. Y. Estimated cost, including equipment, $45,000.

Ohio

CLEVELAND—Bryant Screw Products & Engineering Co. is being formed to operate tool and die manufacturing business. Agent is Samuel J. Forbes, 1158 Leader building. Attorney, C. L. Kaps, Marshall building.

CLEVELAND—American Stove Co. is adding $8000 factory structure to building No. 82 at 1827 East Forty-first place. Main offices are at 4901 Perkins avenue. T. P. Muelhauser is engineer in charge.

CLEVELAND—Harris-Seybold & Potter Co., 4500 East Seventy-first street, has given contract to Gillmore-Carmichael-Olson Co., 1873 East Fifty-fifth street, for boiler house. Estimated cost $40,000.

CLEVELAND—Plating & Galvanizing Co., T. E. Round, vice president, Garfield boulevard, has let contract for 40 x 200-foot machine shop addition to E. J. Benes & Co., Terminal Tower. Estimated cost $50,000. L. L. Broida, 1643 Lee road, architect.

CLEVELAND—New York Central railroad, J. W. Pfau, chief engineer, 466 Lexington avenue, New York, will build one-story wheel regrinder building and one-story machine shop here. Estimated cost $40,000. (Noted Aug. 17).

CLEVELAND—Cleveland Chain & Gear Co., Bedford road, has let contract to E. J. Benes & Co., Terminal Tower, for boiler house addition.

CLEVELAND—Contract for boiler house building at the barracks project at Ridge and Clinton roads, has been awarded to John Gill & Sons Co., Bulkley building.

CLEVELAND—Sam W. Emerson Co., 1836 Euclid avenue, is making general alterations to building at 1802 East Thirty-eighth street for occupancy by J. P. Schweitzer Co.

CLEVELAND—Forest City Foundries Co., 2500 West Twenty-seventh street, has let contract to Sam W. Emerson Co., 1836 Euclid avenue, for generator building.

DAYTON, O.—War Department, Washington, has plans maturing for addition to power plant at military development in Ohio. Bids will be asked by United States Engineers office, Dayton.

MANSFIELD, O.—A $40,000 addition for both factory and office space is being planned by Hughes-Keenan Co., manufacturer of dump bodies, cranes and other pressed steel products.

SPENCER, O.—Spencer Mfg. Co. is altering and repairing factory building, presumably in preparation for undertaking war work.

WILMINGTON, O.—Auto Compressor Co. will make additions and alterations to its plant here.

Pennsylvania

BRADFORD, PA.—Bovaird & Seyfang Mfg. Co., Bradford, has let contract to H. K. Ferguson Co., Hanna building, Cleveland, for additions to its plant.

Illinois

ROCKFORD, ILL.—Twin Disc Clutch Co., 1328 Racine street, Racine, Wis., has awarded contract for factory here to Johnson & Hendrickson, 422 Dodge street, Racine. Cost, including equipment, $40,000. F. J. Hoffman, Racine, architect.

Indiana

INDIANAPOLIS—R.C.A. Mfg. Co., 1201 North Front street, Camden, N. J., has given contract for design and construction of one-story 112 x 500-foot factory to H. K. Ferguson Co., Hanna building, Cleveland. Estimated cost $500,000.

RICHMOND, IND.—Perfect Circle Co., Hagerstown, Ind., will build plant here for manufacture of piston rings for airplane motors.

Alabama

HOLT, ALA.—Cunningham Rudy Co., Detroit, care of Mr. Jensen, 1006 First National Bank building, Tuscaloosa, Ala., has contract at $2,000,000 for chemical plant for Reichhold Chemicals Inc., 601 Woodward Heights, Ferndale, Mich.

Tennessee

CHATTANOOGA, TENN.—Westbrook Sons, 2108 Ringold road, plans detinning plant, cost of which is estimated at $80,000.

KINGSPORT, TENN. — Tennessee-Eastman Corp. plans installation of electric power equipment in multi-unit plant in Tennessee. A power substation and boiler house will be built. Entire project to cost over $3,000,000.

Florida

COCONUT GROVE, FLA.—Shelley Tractor & Equipment Co., 3650 Bird avenue, has let contract to Witters Construction Co., Alton road, Miami Beach, for addition to shop building.

Louisiana

ABBEVILLE, LA.—City, Emile Dutel, mayor, will construct $75,000 filtration plant.

NEW ORLEANS—New Orleans Public Service Inc., 317 Baronne street, will spend approximately $189,000 for power house additions. Ebasco Service Co., engineer.

Missouri

KANSAS CITY, MO.—Pratt & Whitney Aircraft Division of United Aircraft Corp., East Hartford, Conn., will install electric power equipment in new plant here. Boiler plant and power substation will be built. Albert Kahn Associated Architects & Engineers Inc., New Center building, Detroit, engineer and architect.

Oklahoma

TULSA, OKLA.—Aluminum Co. of America, Pittsburgh, is considering establishment of aluminum drop forging plant here. Thomas D. Jolly is company's chief engineer.

Wisconsin

MILWAUKEE—Karr Mfg. Co. Inc., 1825 South Kinnickinnic avenue, has let contract for remodeling four-story factory and boiler room to A. Schmitt & Son, 2771 North Cramer street.

MILWAUKEE—Perfex Corp., 500 West Oklahoma avenue, has awarded contract to Permanent Construction Co., P. O. box 2057, for factory addition.

WEST ALLIS, WIS.—Allis-Chalmers Mfg. Co., 1126 South Seventieth street, will build one and two-story 32 x 176-foot rectifier and assembly building, for which contract has been awarded to Gebhard-Bughammer Inc., 5420 West State street, Milwaukee. C. E. Meyer, care of owner, architect.

Texas

CORPUS CHRISTI, TEX.—American Cyanamid Corp., 535 Fifth avenue, New York, has

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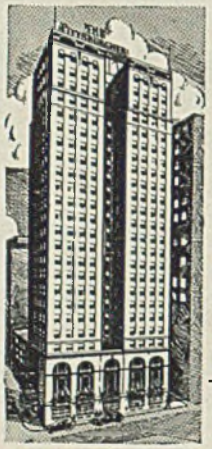
let contract to Chemical Construction Co., Heep building, Corpus Christi, for chemical plant costing approximately $500,000. P. S. Shroy is supervising engineer.

HOUSTON, TEX.—Black-Broillier Inc., 803 Blodgett street, has let contract for expanding and remodeling its pipe manufacturing plant. Estimated cost $60,000.

JACKSONVILLE, TEX.—Sheffield Steel Co., Kansas City, Mo., has let contract to Arthur G. McKee Co., 1918 Texas street, El Paso, Tex., for iron ore mining unit in Mount Haven area.

Minnesota

RUSHFORD, MINN.—Dairyland Power Cooperative Inc., Arcadia, Wis., is considering extension to power plant here, with installation of additional equipment.



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California

LOS ANGELES—Contract has been let for boiler house at 5215 Boyle avenue, here, for Norris Stamping & Mfg. Co.

LOS ANGELES—Allied Machinery Mfg. Co. has been organized with $25,000 capital by Fred Aberle, H. W. Elliott, and H. M. Dunham. The new corporation is represented by Aberle & Dunham, 510 West Sixth street, Los Angeles.

SAN PEDRO, CALIF.—Contract has been awarded for compressor building at Western Pipe & Steel Co.'s shipyard here, to cover an area 40 x 77 feet.

Oregon

PENDLETON, OREG.—City has $112,320 federal grant for water system improvements including 8,000,000-gallon reservoir, filtration plant and other facilities. John W. Cunningham & Associates, Portland, Oreg., engineers.

Washington

KIRKLAND, WASH.—City has awarded contract at $109,950 to C. V. Wilder, Bellingham, Wash., for sewage treatment plant. City has also received $360,000 federal funds for improvements to water system.

SEATTLE—Fentron Steel Co., 1401 West Garfield street, is considering erection of plant addition.

Canada

BRANTFORD, ONT.—Waterous Ltd., Market street, D. M. Waterous, manager, has given general contract to Cromar Construction Co., 446 Colborne street, for plant additions to cost about $40,000, with equipment.

BRANTFORD, ONT.—Cockshutt Plow Co. Ltd., 66 Mohawk street, W. J. Phillips, general manager, has let general contract to Cromar Construction Co., 446 Colborne street, for plant addition to cost about $35,000, equipment extra.

COLDWATER, ONT.—Certified Public Buildings, 107 Front street East, has had plans prepared and will let contracts soon for plant addition and installation of equipment to cost about $100,000. Equipment to be installed includes wood shredder, excelsior machinery, die manufacturing and maintenance equipment, etc.

CHATHAM, ONT.—Ontario Steel Products Co. Ltd., 81 St. George street, J. S. Hargraft, manager, has given general contract to Frank Brown, for further plant addition here to cost about $15,000, equipment extra.

COOKSVILLE, ONT.—Ward Electric Laboratories, Dundas street and Orchard road, is considering plans for manufacturing plant here estimated to cost about $100,000, with equipment.

GEORGETOWN, ONT.—Smith & Stone Ltd. has plans and will let contracts soon for porcelain plant here. Plans call for building 160 x 175 feet, to cost about $60,000, with equipment to be installed at cost of upwards of $100,000. Equipment includes pressing machinery, machining and grinding equipment, etc.

LONDON, ONT.—E. Leonard & Sons, 380 York street, is considering plans for boiler shop to cost about $100,000, with equipment.

OTTAWA, ONT.—Modern Containers Ltd., 346 Queen street, has had plans prepared and will let contracts immediately for plant addition to be equipped with lathes, grinders, etc., at cost of about $45,000.

OSHAWA, ONT.—General Motors of Canada Ltd., Division street, W. R. Roberts, general manager, has plans for plant alterations and installation of machinery to cost about $35,000.

SARNIA, ONT.—Polymer Corp. Ltd., J. R. Nicholson, manager, 320 Bay street, Toronto, in association with Department of Munitons and Supply, Ottawa, has given general contract to Carter-Halls-Aldinger Co. Ltd., 419 Cherry street, Toronto, at approximately $1,500,000 for steam-electric power plant, pumping station and dockage here, in connection with proposed synthetic rubber plant. H. G. Acres & Co. Ltd., 1870 Ferry street, Niagara Falls, Ont., consulting engineers.

THAMESVILLE, ONT.—Thamesville Metal Products Ltd. has plans and will start work soon on plant addition to cost about $15,000, equipment installations to include steam boiler, plating tanks, drying ovens and special miscellaneous machinery.

TORONTO, ONT.—John Inglis Co. Ltd., 14 Strachan avenue, has given general contract to A. W. Robertson Ltd., 57 Bloor street West, for plate shop, 100 x 400 feet to cost about $350,000. Plans by Allward & Gouinlock, architects, 57 Bloor street West.

TORONTO, ONT.—International Aeronautical Corp. Ltd., 289 Sumach street, has given general contract to William Halliday & Son, 271 Forest Hill road, for plant here to cost about $30,000, equipment extra.

SKEAD, ONT.—M. J. Poupore Lumber Co., Gogama, Ont., is having plans prepared for new plant here and addition to present plant. Work to include sawmill, planer mill, machine shop, blacksmith shop, etc.

TRENTON, ONT.—Central Bridge Co. Ltd., 300 West street, has plans for one-story plant addition to cost about $10,000, equipment extra.

WESTON, ONT.—Massey-Harris Co. Ltd., 915 King street West, Toronto, has extended contract to A. W. Robertson Ltd., 47 Bloor street West, Toronto, to include several more plant units here to cost about $75,000. New work will include jig and tool plant.

WINDSOR, ONT.—Bendix Eclipse of Canada Ltd., 1473 Argyle road, has plans by Sheppard and Masson, architects, 52 Chatham street West, for plant unit to cost about $180,000.

WINDSOR, ONT.—Colonial Tool Co. Ltd., Sandwich street East, in association with Department of Munitions and Supply, Ottawa, has given general contract to Dinsmore-McIntyre, Security building, for plant for manufacture of machine cutting tools, at cost of about $150,000.

WINDSOR, ONT.—Viking Pump Co. of Canada Ltd., 661 Grove street, J. C. Petersen, manager, has plans and will let contracts soon for plant addition to cost about $25,000. Equipment will include internal grinder, drill press, metal cutting band saw, heavy duty lathe, turret lathe, etc.

TADANAC, B. C.—Consolidated Mining & Smelting Co. of Canada Ltd., Trail, B. C., will build addition to foundry and make other improvements to plant here to cost about $30,000, with equipment.

VANCOUVER, B. C.—West Coast Shipbuilders Ltd., 205 West First avenue, will build plant addition here to cost, with equipment, about $50,000.

VANCOUVER, B. C.—Vivian Engine Works Ltd., 1100 West Sixth avenue, is completing arrangements to start work on construction of machine shop. Estimated cost, with equipment, $250,000.

FLIN FLON, MAN.—Emergency Metals Ltd., 500 Royal Bank building, Winnipeg, Man., is completing plans for construction of mine buildings and installation of equipment here to cost about $325,000.

WINNIPEG, MAN.—Winnipeg Electric Co. will start work soon on garage, machine shop, etc., and install equipment to cost about $135,000.

MONTREAL, QUE.—B. J. Coghlin Co. Ltd., 3320 Ontario street East, has given general contract to James Thom & Co. Ltd., 660 St. Catharine street West, for plant addition to cost about $15,000. Nobbs & Hyde, 1240 Union avenue, architects.

THREE RIVERS, QUE.—Canadian International Paper Co. Ltd., Sun Life building, Montreal, has started preliminary work on addition to plant here to cost about $40,000, including equipment. Complete core manufacturing machine and other equipment will be installed.

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USED STEEL PLATES

200/250 tons ½" and ⅝" thick; 6' to 7' wide; up to 23' long
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500/600 tons ⅜" and ½" thick; 3' to 5' wide; 4' to 5' long

Located in Greater New York

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PLATE CROP ENDS

from 3/16 to 5/8" thick assorted to thickness unassorted to size. A-3 priority required.

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25,000 Pieces 3⅜" O.D. x .135" wall x 82⅛" Hot Rolled Electric Resistance Welded Tubes.

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RELAYING RAILS — Super-quality machine-reconditioned—not ordinary Relayers.
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Hydraulic Riveting Machines, 48" throat, 1½" daylight.
400 lb. Air or Steam-Operated Drop Hammer
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230 Volt DC Motors Constant Speed

60	Gen.	Elec.	RC-35	700
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40	Gen.	Elec.	CD-103	1500
40	Gen.	Elec.	CD-95	1750
25	Westinghse.		SK-120	825

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GEAR CUTTERS Spur, 30", 36", 40", M.D.
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SHEAR Squaring, 10' x 16 ga. Ohl, M.D.
SHEARS Squaring, 54", 48" & 40" x 1/4", M.D.
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1—250 pound to one ton Electric Melting Furnace. Address inquiries stating full particulars to Hi-Alloy Castings Co., P. O. Box 193, New Brighton, Pa.

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Connersville-Roots positive blowers. Centrifugals for gas and oil burning Sand blast, grinder and dust exhausters. Ventilating fans and roof ventilators.

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Large manufacturing company in Western Pennsylvania requires metallurgical engineering graduates or college men with experience in ferrous or nonferrous metals. Several openings that exist include special production treatment; steel, malleable and gray iron castings; brass, bronze, copper and aluminum castings; and wrought copper products. Salary depends upon extent of training and experience. Reply Box 760, STEEL, Penton Bldg., Cleveland.

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Fourteen years successful experience in integrated steel plant engineering, operation and maintenance. Capable in coordinating technical work or serving in liaison capacity. Age 36. Now employed. Address Box 750, STEEL, Penton Bldg., Cleveland.

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Experience as a Chief Inspector on H. E. and shrapnel shells during World War I—Progress Charts—Blueprints—General knowledge production requirements—Familiar pressed metal work. Reply Box 756, STEEL, Penton Bldg., Cleveland.

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Positions Wanted

EXECUTIVE—23 YEARS EXPERIENCE IN Management—Engineering Sales—Plant and Production Layouts—Time Study—Design of Rolling Mill and Special Machinery—Practical knowledge of Machine Shop and Foundry Practice—Design of Rolling Mill and Special Machinery—Because of backlog of orders now handling co-ordination of materials—desires to return to field of Management, Operation and Engineering with an Organization which can assure a definite future. Reply Box 758, STEEL, Penton Bldg., Cleveland.

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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.

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New Opportunities in contract work are rapidly developing, due to increasing government orders, and large production backlogs. Why not take advantage of this situation? The "Contract Work" columns of STEEL will carry your qualifications to concerns now letting contract work. Write today for rates.

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An advertisement here puts you in touch with trained, efficient, reliable men looking for new lines. Write STEEL, Penton Bldg., Cleveland, O.

SAY IT HERE

If you have facilities to handle additional work. An advertisement in this section will tell others of your capacity, etc. Write STEEL, Penton Bldg., Cleveland.

ADVERTISING INDEX

Where-to-Buy Products Index carried quarterly

ADVERTISING INDEX

Where-to-Buy Products Index carried quarterly

How to get maximum use from Monel

After long years of service old equipment can be re-fabricated into useful accessories

Despite the severely corrosive effect of hot acid, plus mechanical abuse, pickling equipment of Monel gives long, economical, trouble-free service. The crate illustrated, for example, though 5 years old, is now used 24 hours a day on war production, handling loads up to 8000 lbs.

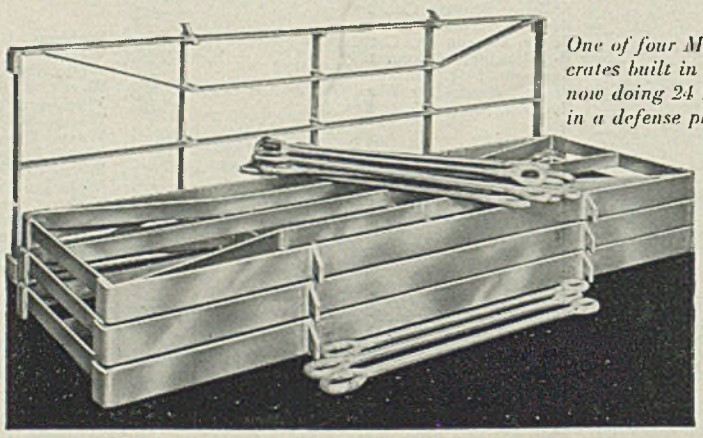
Even after years of service as pickling equipment, Monel is still good for further use. Some plants have built re-designed crates from the parts of old ones. Others use tie-rods for making separator hooks, chains, finger rods, etc. A large steel mill found that old Monel tie-rods proved superior to the metal previously used for spray nozzles on descaling equipment. Although accustomed to paying up to $10 each, nozzles of their own design made from the discarded Monel rod cost only 61¢ and gave a life several times that of the old ones.

Around your plant there may be parts of discarded Monel equipment. If so, put it to work in the drive for victory. Information on fabricating Monel gladly furnished on request.

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

INCO *Nickel Alloys in the War Effort.* With the Nation at war, every pound of Nickel, Monel and Inconel that expanded facilities can produce is urgently needed for vessels of the Navy, mechanical and chemical equipment for the Army, vital parts of Aircraft, and for Chemical, Petroleum, Steel and other essential industries. As part of the all-out war effort the International Nickel Company will continue to report for the benefit of such users information concerning the selection, fabrication and use of Nickel and Nickel Alloys.

"Monel" is a registered trade-mark of The International Nickel Company, Inc., which is applied to a nickel alloy containing approximately two-thirds nickel and one-third copper.



One of four Monel pickling crates built in 1937, now doing 24 hour duty in a defense plant.

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MONEL • "K" MONEL • "S" MONEL • "R" MONEL • "KR" MONEL • INCONEL • NICKEL • "Z" NICKEL

Sheet . . . Strip . . . Rod . . . Tubing . . . Wire . . . Castings