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# STEEL

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NOVEMBER 4, 1946

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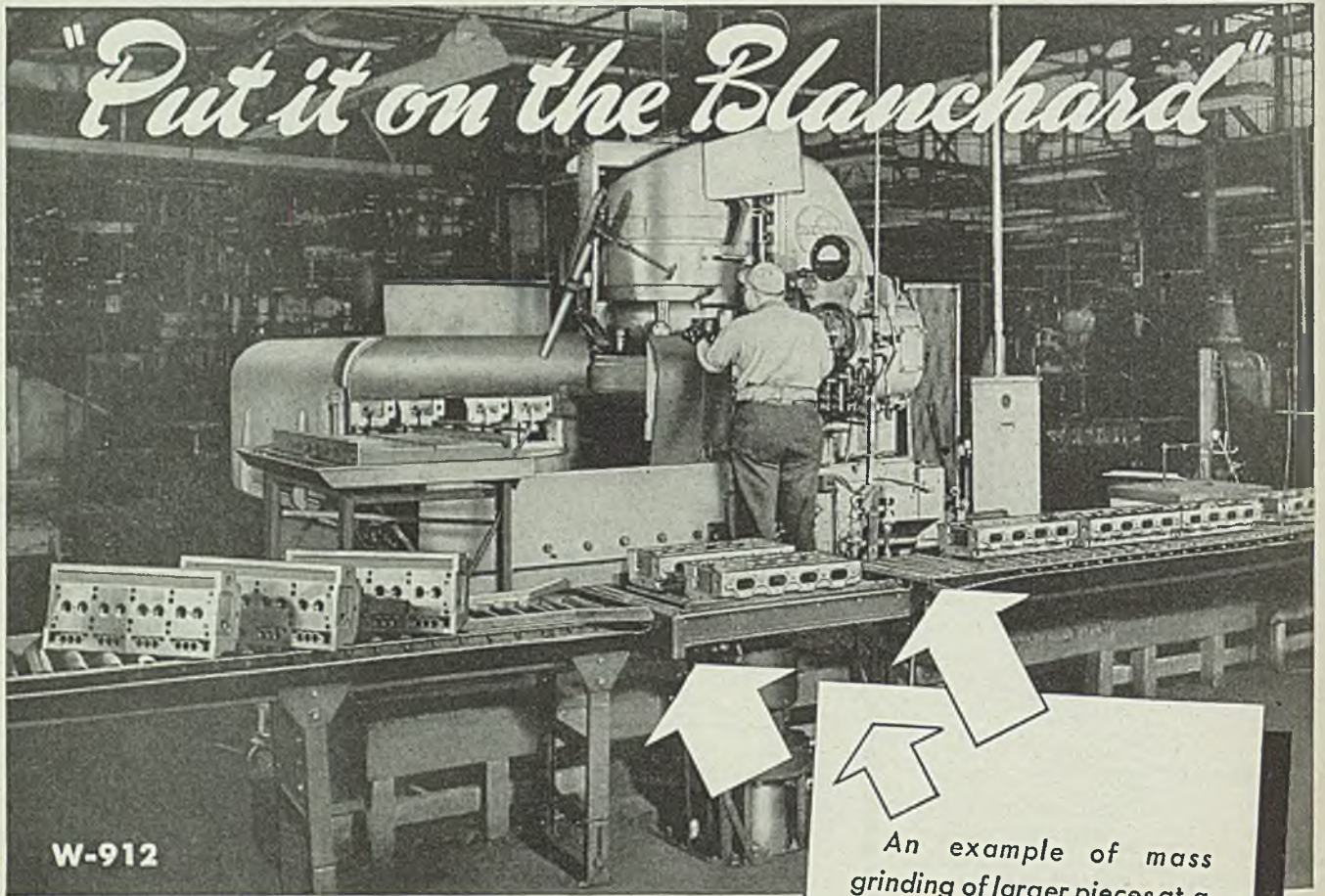
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## NEXT WEEK...

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New Applications Expand Use of Porcelain Enamel  
Die Casting Magnesium Alloys  
Heat Treating Stainless Steel Parts



# "Put it on the Blanchard"



W-912

## THE MOST PROFITABLE WORDS IN FLAT SURFACE GRINDING

Whatever type of flat surface grinding your parts may require—be it simple "cleaning up"—or rough grind and finish grind in one operation—or very flat surfaces with a fine finish and held to close limits—there is no more profitable method, in practically all cases, than to "Put it on the Blanchard."

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Four diesel cylinder heads are held on a 60" magnetic chuck of a No. 27 Blanchard Surface Grinder. The material is cast iron. Each head measures  $25\frac{1}{2}" \times 10\frac{1}{4}" \times 5\frac{3}{16}"$ .

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The **BLANCHARD** MACHINE COMPANY

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## Welcome Moderation

If the reader will put his ear to the ground he will hear the rumbling of a force that may bring order out of confusion. This force is the awakening of thoughtful citizens to the futility of the policies the nation has been pursuing since V-J Day and their determination to adopt a more sensible program.

Evidence of this change of attitude is mounting rapidly. It is reflected in the refusal of prospective home owners to pay twice what a house is worth. It is mirrored in the decision on the part of potential car buyers to put up with the old jalopy until the new cars are more trustworthy, can be delivered complete with accessories and are more reasonably priced. It is found in the reluctance of housewives to pay excessive prices for meat, in the decision of retailers to cut down on purchases and inventories of high-priced second rate merchandise and in the growing disposition of the public generally to weigh dollars against the real value of the article purchased. Not the least convincing evidence of this character was the statement by the business survey committee of the National Association of Purchasing Agents that an industrial buyers' strike may be imminent and that "buying at any price, to keep a plant running, may be approaching an end."

These signs of a return to sanity are having a profound effect. In spite of the John L. Lewis threat in coal and of the bravado of some other union leaders concerning early demands for higher wages, responsible labor chieftains are beginning to realize that increase in base pay is not the complete answer to the wage earner's problem. Likewise, manufacturers know full well that higher prices for their products is not the sole remedy for their troubles. All along the line, in every walk of life, there is a belated realization that the upping of wages and then of prices, repeated time and again, defrauds everybody and benefits nobody.

The only way for the nation to get out of its present predicament is to push production to the limit. Volume output will reduce unit costs, permit technological progress to come into play and help everybody concerned—stockholders, management, employees, customers and the general public—to escape the peril that will be inevitable if we foolishly continue to march on the treadmill of inflation.

Moderation is definitely on the make. It may be bolstered substantially by the results of tomorrow's elections.

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**STEEL**

November 4, 1946

**SPEED UP DECONTROL!** Experience in the United States, as in other countries that have tried government regulation on a large scale, has demonstrated that if controls are to work they must be applied to everything controllable within a given field. To control a few items while others are free is worse than no control at all.

This experience should have taught Washington that it had the choice of controlling everything or nothing. There is no practicable middle ground. Now that the President's decision is to decontrol,

there is no point in retaining controls on isolated items any longer than is necessary to perform the physical work of abandoning them. In fact, delay in lifting remaining controls can cause extraordinary harm.

Price controls have been removed effective Nov. 1 on iron ore shipped on or after next Jan. 1, alloy steel products, steel wire rope and strand, alloy tool steel rolled products, alloy specialty steel and certain trucks and trailers. However, most iron and steel products, as well as scrap, still are subject to OPA

restrictions which are hindering production and will continue to do so with increasing severity until the bans are off.

The fact that an item is in short supply now is a thin excuse for continuing controls. The sooner all restrictions are removed, the sooner will supply increase and prices adjust themselves to normal influences. —p. 71

• • •

**PHILIPPINE INCENTIVE:** In order to attract American capital to the Philippine Islands, the Congress of the new republic has passed legislation providing for complete tax exemption for new industries for an initial period of four years.

This action is significant in that it is one of the first overtures on the part of a war-devastated nation to seek the aid of private enterprise in developing its industries and natural resources. In most sections of Europe and the Far East that were ravaged by war, complicated diplomatic differences must be resolved and stable local governments established before private corporations can take part in the great task of rehabilitation.

More railroads, highways and shipping are needed in the Philippines. Mineral resources await development. Agriculture can be partly mechanized to advantage. Manila is a convenient point from which to serve the Orient. With a stable government and friendly Philippine-United States relations, participation by American companies in the islands' development should prove mutually beneficial. —p. 75

• • •

**REMARKABLE RECORDS:** Many persons are so deeply concerned with strikes, materials shortages and confusion in government that they are overlooking the truly remarkable current performance of the railroads and the public utilities.

In the week ended Oct. 19 revenue freight car loadings totaled 931,766. This exceeds loadings in any week during the war. In fact, one has to go back to weeks in 1929 and 1930 to find loadings exceeding this figure. Obviously the earlier loadings are not comparable because the average tonnage per car was less than it is now.

Electric power output in the week ended Oct. 26 was 4,601,767,000 kilowatt-hours. This weekly total has been exceeded only three times in history—in the weeks ending Jan. 13, 1945; Dec. 23, 1944; and Dec. 18, 1943. Output in the seasonal peak week of next December may easily smash these records.

Can the fact that government has not been meddling much in freight and power account partly for these impressive records? —p. 150

**SIGNS OF THE TIMES:** A recent survey by the American Society for Engineering Education indicates that 337,000 engineers will be required to service the economy in 1950. The society estimates that the deficiency in engineering school graduates caused by the war (p. 72) cannot be made up until 1952. . . . Warm air furnace manufacturers expect shipments in 1946 to total 600,000 units (p. 76), which will top the previous peacetime record of 517,610 in 1941 by 16 per cent. Shipments next year are expected to reach one million units. . . . Two reports on guaranteed wage systems will be issued this month. One, by the Guaranteed Wage Study Staff of OWMR Advisory Board, is due Nov. 12 (p. 72) and the other is by A. D. H. Kaplan of the Brookings' Institution. . . . On the basis of studies of many machine tool operations made during the past year, the conclusion has been reached that refrigeration of the coolant (p. 96)—maintaining it at a constant temperature between 65 and 95° F depending upon the speed with which heat must be removed—not only forestalls unfavorable conditions such as tool failure but in some cases is the only means by which utmost efficiency and uniform results can be insured. . . . Value of building construction in the Los Angeles area during the past six months was almost \$133 million (p. 84), compared with \$71 million for Chicago, \$69 million for Detroit and \$61 million for New York. . . . Members of the National Tool & Die Manufacturers Association, in their first national meeting in Chicago (p. 67), heard three customers and three tool manufacturers debate "Good Service on Special Tooling." Consensus was that each should take the other more fully into his confidence—the user in explaining what the tools are for and the maker in presenting accurate quotations based upon real engineering. . . . Optimism of structural steel fabricators as to the volume of business in sight is tempered by the confusion of restrictions, material shortages and labor policies. This condition was voiced by speakers at the annual convention of the American Institute of Steel Construction (p. 68), meeting on the Pacific Coast for the first time, at Coronada Beach, San Diego. . . . Gearmakers at the convention of the American Gear Manufacturers' Association in Chicago heard H. J. Clyman of Westinghouse Electric predict (p. 66) that the gas turbine-propeller type of power plant, rather than the rocket type, is the coming thing in commercial aviation.

*E. L. Shaner*

EDITOR-IN-CHIEF



# How to Lower The Machine-Side Cost of Steel

Steel is a low cost large tonnage product when compared with other metals. But the net cost delivered alongside your machinery and equipment varies greatly in different plants depending upon the mill methods of packing and shipping—and the manufacturers' methods of receiving and handling.

The preservation of quality is still another factor in final machine-side delivery. For these reasons Inland packing and shipping experts are always studying and trying new and better methods that will not only protect the quality but lower the delivered cost of steel.

They are also glad to work on your particular problems—determining the method of transportation; type of cars or trucks required; sizes of lifts or packages; protection needed for material

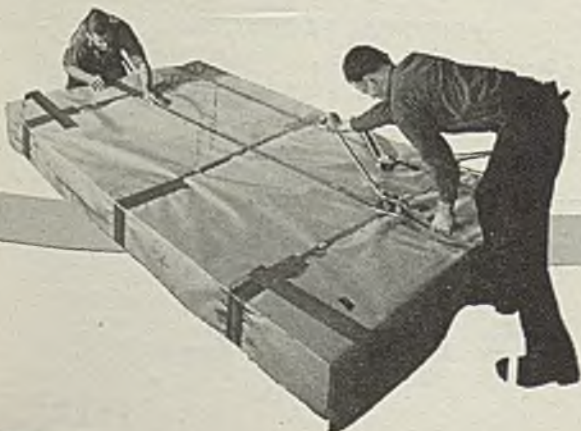
in transit; methods of unloading; character and capacity of unloading and handling equipment... all important factors in net costs of delivered steel.

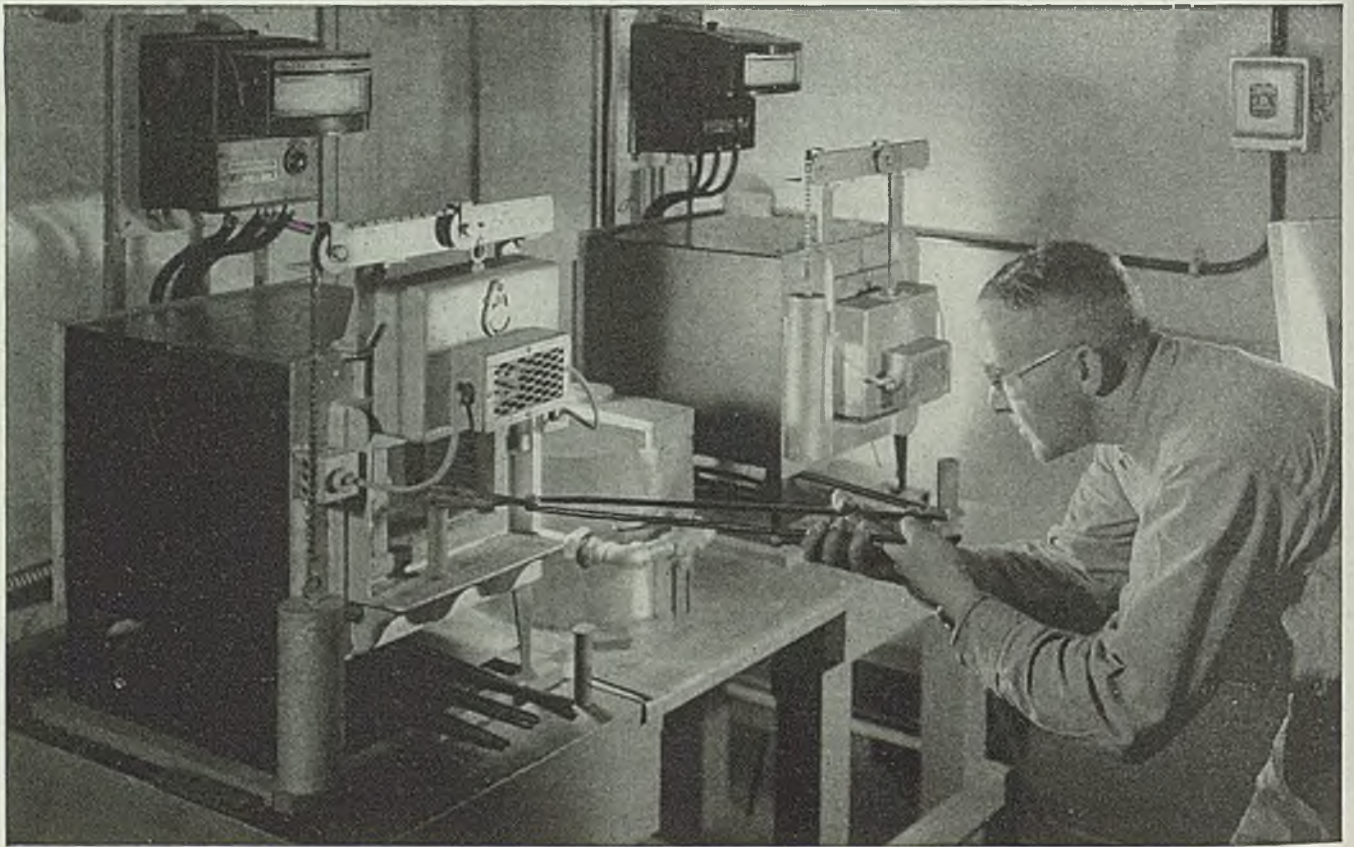
Proof of results is revealed in cases where unloading costs were reduced by 75%... car unloading improved from 6 to 16 cars in eight hours... storage space reduced 40%... and there are many other cases of important savings for Inland customers.

We are still unable to meet the great demand for Inland steel... but we are always glad to cooperate with our customers in determining not only the right steel for their particular needs but also to aid them in developing the lowest possible machine-side cost of steel.

You are invited to call whenever you believe we may be of service.

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## Ryerson Laboratory Adds Extra Value to Steel from Stock

Steel from Ryerson means more than just steel from stock. It means that every heat has met exacting Ryerson specifications—based on more than 103 years of experience in the steel industry. It means that chemical analysis and physical properties are “as advertised” because Ryerson never stocks “seconds” or off heats. And often, it means steel made more valuable to you by the work of the Ryerson laboratory.

Whether you specify, buy or fabricate steel the laboratory serves you. There's no need for hit or miss heat treating when the laboratory runs Jominy hardenability tests on every heat of alloy in Ryerson stocks. Furnishes the results at no charge as a guide to heat treatment.

The laboratory also prevents uncertainty when definite specifications must be met. If carbon steel plates must not exceed a certain hardness limit, or if bars must have specified tensile strength, laboratory tests select the exact steel you need from Ryerson stocks.

These and other trouble-saving laboratory services point up two important reasons why more steel users call

Ryerson: Persistent Ryerson effort to provide more complete, more practical service on steel from stock plus constant vigilance in maintaining high quality.

Because of the steel shortage many sizes still are missing from Ryerson stocks, but your size or a workable alternate may be available. Contact the nearest Ryerson plant when you need steel.

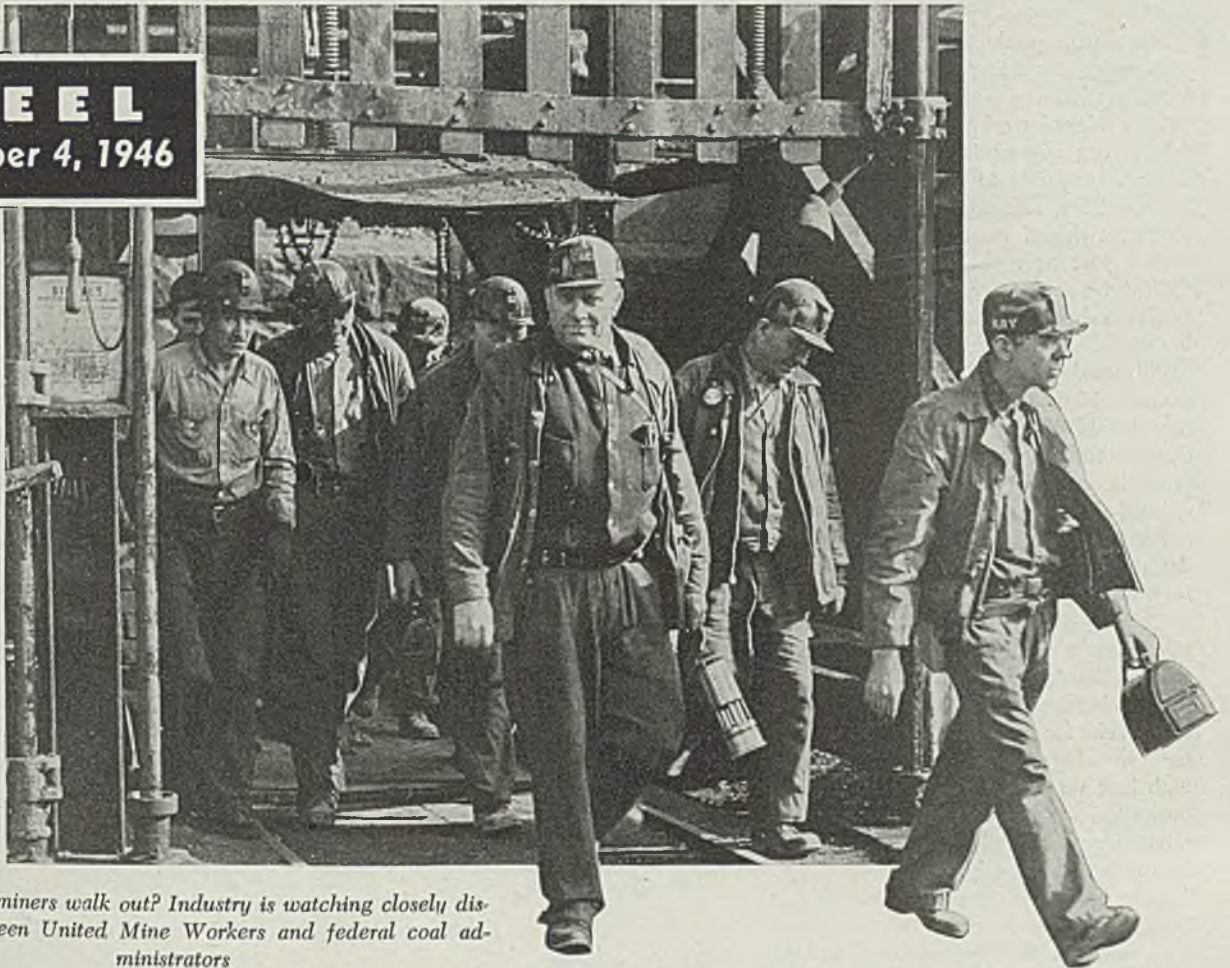
**Joseph T. Ryerson & Son, Inc., Steel-Service Plants at: Chicago, Milwaukee, Detroit, St. Louis, Cincinnati, Cleveland, Pittsburgh, Philadelphia, Buffalo, New York, Boston.**

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# RYERSON STEEL

**STEEL**  
November 4, 1946



*Will the coal miners walk out? Industry is watching closely discussions between United Mine Workers and federal coal administrators*

## Industrial Coal Stocks Below Normal

INDUSTRIAL coal inventories generally are lower than before the start of last spring's mine strike and should another stoppage develop this autumn its effect on steel production and metal-working activity would be felt quickly.

Stocks of practically all consumers were virtually exhausted during the April-May tieup. Although coal production since the mines resumed has been higher than for the comparable period in 1945, the effects of the two-month shutdown have not been overcome. Coal output for the year to date is about 33 million tons behind that for last year. Few consumers have been able to rebuild their stocks to normal.

In the great steelmaking centers of Pittsburgh, Youngstown and Chicago, producers report a mine shutdown would be reflected in steelworks operations almost immediately. At Pittsburgh, stocks average only 12 days' supplies. Some large byproducts coke plants have only 7 days' supplies. At Chicago, stocks are sufficient for two weeks to 30 days at present operating rates. These were the steel production areas hardest hit in the spring mine strike.

*Mine walkout would cause early drop in iron and steel production. Many furnaces would be closed down almost immediately. Coal output for year lags 33 million tons behind comparable 1945 period. Consumers unable to rebuild inventories*

Whether the discussions now underway between John L. Lewis and the Coal Mines Administration will resolve the dispute is still a matter of conjecture. The President's statement that there would be no coal strike is not accepted with much confidence, except as it is interpreted as meaning there will be no strike before the elections.

Reconversion officials last week, however, were predicting that the administration would permit Lewis to set the pattern for a new round of wage increases. The federal officials were talking of awarding the miners pay increases of between 15 and 20 cents an hour and writing the new wage agreement Lewis is demanding.

Should the government capitulate to Lewis' demands, a mine tieup this fall likely will be averted. However, such action would lead to other difficulties,

probably including another prolonged period of government operation of the mines which have been under government control since May 29.

Also, if the government coal mines administration should grant a further wage increase to the miners, a pattern for another round of inflationary wage increases would be established—with government sanction.

As a possible alternative, the government may make it clear to Lewis and the mine operators that inasmuch as they both believe in free collective bargaining, they should get together and work out a new agreement for themselves.

Should pay increases be granted the miners, federal economists believe it would just about mean the end of efforts to control prices on basic industrial materials. A miners' wage increase would necessitate higher coal prices and ad-

vances on the products of the heavy coal consumers, including steel and major metal products.

Coal miners' weekly earnings now are the highest of any industrial group. In August, according to the Bureau of Labor Statistics, soft coal miners averaged \$62.37, a rise of more than 25 per cent over a year ago.

Coal inventory position of steel producers and other industrial users in leading districts are briefed as follows:

**Pittsburgh**—Steel producers' stocks average 12 days' supplies and production would be curtailed almost immediately in event of strike. Utilities' stocks range between 30 and 50 days' supplies; railroads have about two weeks' supplies.

Practice in past has been to freeze last day's production before a mine walkout for rationing to domestic consumers.

**Chicago**—With two or three exceptions, stocks are lower than at start of mine strike Apr. 1. Coking coal on hand or on wheels ranges from a minimum of two weeks for two plants up to 30 days for two others. In event of strike, those with best supplies might be able to hold operations at present level for a week; others would be obliged to take economy measures immediately.

In at least two instances, Chicago district steel plants supply coke oven gas to municipalities for domestic fuel and in one case water pumping is dependent upon electric power from this source. This responsibility would require the steel

companies to stretch fuel supplies to the limit.

Utility companies have 75 days' coal supply, compared with only 50 days' last April. Furthermore, the power companies have as standby equipment the fuel oil burners installed last spring.

**Youngstown**—Steel output here will be cut almost immediately if another coal strike closes the bituminous mines. Stocks are far below normal. Local steel producers normally use 6 to 8 million tons of coal a year, mostly from captive mines. Carnegie-Illinois Steel Corp.'s Ohio Works gets its coke from the Clairton, Pa., byproduct plant which would be affected quickly by a coal strike.

**Philadelphia** — Steel producers are watching developments in coal wage negotiations closely as a mine walkout would cause some blast furnaces to be banked within a week. This would curtail not only open hearth operations but foundry output as well.

General industrial operations would not be affected as quickly as most plants have stocks adequate for 30 days' operations.

**New York**—Should soft coal mines close later this month, most large consumers would be forced to limit operations within 20 to 30 days. Settlement of the maritime and truckers' strikes have eased the situation.

**Birmingham**—Local industries have been unable to build substantial inventories since spring coal strike. Supplies

of most companies do not exceed two weeks' requirements.

## Steel Scarcity Stalls Further Output Gain

Additional overall production increases can not be expected until the output of steel is increased, John D. Small, administrator, Civilian Production Administration, said last week.

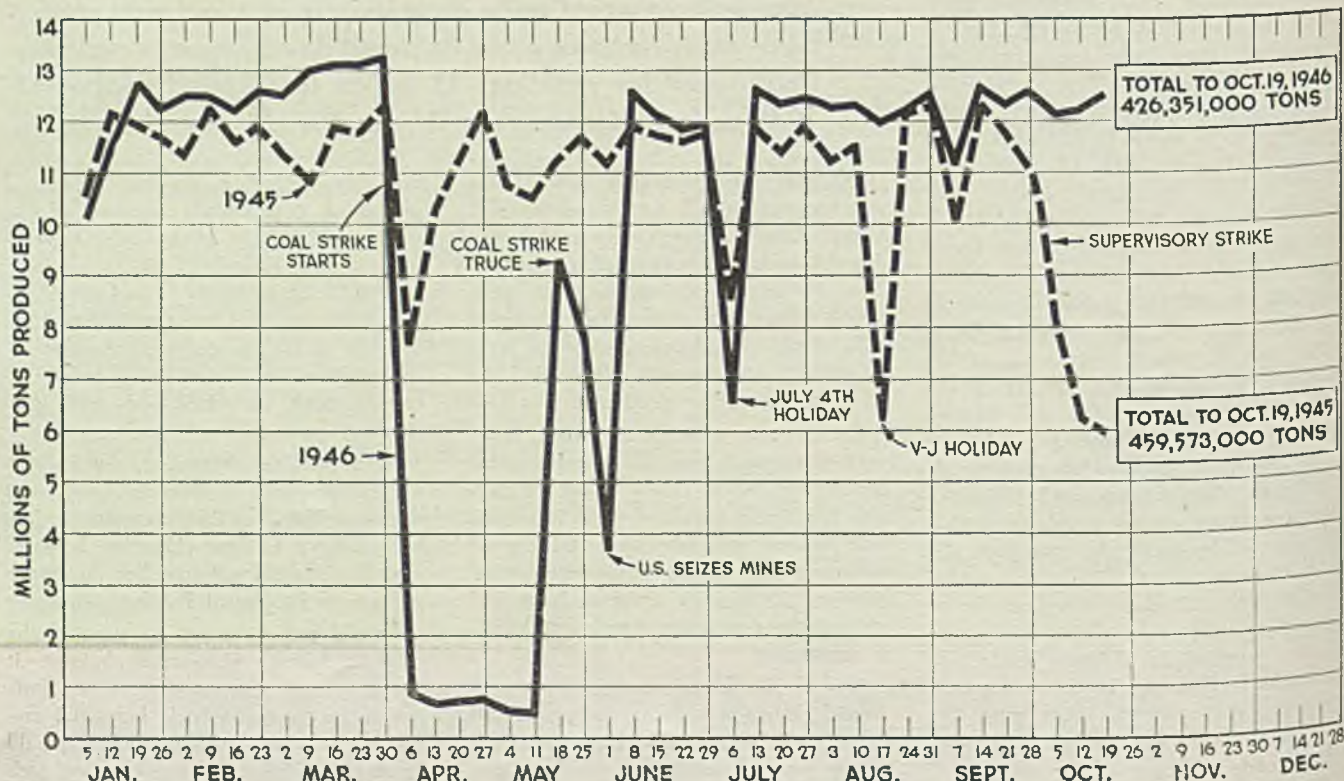
He said "the shortage of steel, particularly sheet steel, permeates the whole economy."

The September report showed continued high level of output of such articles as radios, electric irons, automobile tires, trucks, gas and electric ranges, and vacuum cleaners.

Civilian employment declined by 600,000, reducing the overall employment figure in September to 57,400,000. Unemployment remained low, rising only 30,000 to 2,070,000 during the month.

Mr. Small warned the nation against talking itself into another depression. He emphasized that he did not think one was inevitable and cited, in part, the following factors as insurance against a depression: The 1 million proposed commercial and industrial building projects, delayed at CPA's request, which form a substantial backlog for the future; the 10 million more persons to be fed, clothed and housed in this country than before the war.

### Weekly Bituminous Coal Production—1945 and 1946





# Steelworkers To Ask Wage Increase

*Demands to be formulated at Pittsburgh meeting of wage and policy committee in mid-December. Murray holds industry able to grant raise without increasing prices*

"HEALTHY" wage increases will be demanded by the United Steelworkers of America when negotiations for new contracts open early next year. This notice was served on the steel industry by Philip Murray, USA president, speaking before a district convention of steelworkers in Philadelphia.

New wage demands will be formulated at a meeting of the steelworkers' national wage and policy committee which will be held in Pittsburgh in mid-December, Mr. Murray said.

Contracts with most steel producers expire around the middle of February and the union plans to propose opening of negotiations soon after the first of the year.

Mr. Murray gave no indication as to the amount of the increase that will be demanded by the union. Traditionally the amount of increases to be asked and the nature of other demands to be made by the union are decided by the wage and policy committee.

Mr. Murray did not stress the guaranteed annual wage demand as an issue in the new negotiations. While this is a

plank in the platform of the steelworkers and other major unions, some observers believe it will be made secondary to the wage demand and may be used only as a back-up demand. These observers believe that if the union leaders think they have a fair chance of winning a wage increase they will be content only to submit the annual wage demand and possibly insist on studies looking toward stabilizing production and employment.

Improved earnings of steel companies, as indicated by third quarter financial reports, will be made a basis for the union's wage demands, Murray indicated.

"American industry is making plenty of money and can well afford to give very healthy wage increases now without increasing the prices of commodities. If industry, through collective bargaining, stabilizes purchasing power by putting higher pay in the worker's envelope, there's no need for any depression."

The increases, he said, will be asked "not out of the spirit of vengefulness, but because the workers need the money

and the day is rapidly approaching when our people will not have enough money in their pocketbooks to buy even the necessities of life."

## Weekly Industrial Wages Up 10 Per Cent from 1945

Weekly earnings in manufacturing are 10 per cent higher than a year ago, according to the Bureau of Labor Statistics.

The loss of weekly earnings resulting from a shorter average work-week has been more than offset by the rise in average hourly earnings of 13½ per cent over the year.

Weekly earnings in manufacturing averaged \$45.10 for September, more than \$4 above the September, 1945, level. Average work-week was 40.1 hours, a decline of 1½ hours from a year ago. Average hourly earnings were 112.3 cents. In durable goods industries, the average hourly rate was 119.7 cents, and in nondurable, 104.7 cents.

## Sale of Blast Furnace to Inland Steel Approved

Sale of the government-owned blast furnace and byproduct plant in East Chicago, Ind., to Inland Steel Co., Chicago, for \$13,250,000 was approved by War Assets Administration last week. The plant was built during the war at an approximate cost of \$34 million.

## Refrigeration Exposition Reveals 5-Year Progress

Requiring three times the floor area of the 1941 show, the fourth exposition of the mechanical refrigeration, air conditioning and frozen food locker equipment industry at Cleveland last week revealed progress since the war. With approximately 200 companies participating, the show included displays of parts applications, new techniques and installations performing services from 80° above zero to 150° below.

Interest of metal producing and metal-working concerns in the refrigeration and air conditioning industry ranges from use of metals in equipment to air conditioning blast furnaces and cold treating metal parts.

Last week's exposition was sponsored by the Refrigeration Equipment Manufacturers Association and the Frozen Food Locker Manufacturers & Suppliers Association. Six major organizations in the industry and allied fields met in Cleveland during the 4-day period from Oct. 29 to Nov. 1.

## Present, Past and Pending

### ■ HUFF RESIGNS OPA METALS PRICE POST

WASHINGTON—Warren M. Huff resigned Nov. 1 as price executive, Metals Branch, OPA, to join the Kaiser-Frazer interests at Willow Run, Mich., in charge of steel purchases. He is succeeded at OPA by Dr. Addison T. Cutler in charge of iron and steel products pricing, and Clarence O. Mittendorf in charge of nonferrous metals pricing. Mr. Huff has been with OPA since 1942 and in government service since 1933.

### ■ FORD CUTS PRODUCTION SCHEDULE 10 PER CENT

DETROIT—Ford Motor Co. has curtailed production of passenger cars and trucks 10 per cent, effective Oct. 25, for the balance of this year due to shortages of steel and deficiency in the pig iron supply for its foundry. Recent strike in the company's open-hearth steel department meant a loss of 17,000 tons of steel.

### ■ 1947 CAST IRON—STEEL NEEDS FOR HOUSING ESTIMATED

WASHINGTON—Veterans' housing program will require quarterly in 1947 about 300,000 tons of cast iron products and 200,000 tons of steel products. Total NHA requirements in 1947 are estimated at 1,168,000 tons of cast iron products and 700,000 tons of steel pressure pipe for water and gas mains.

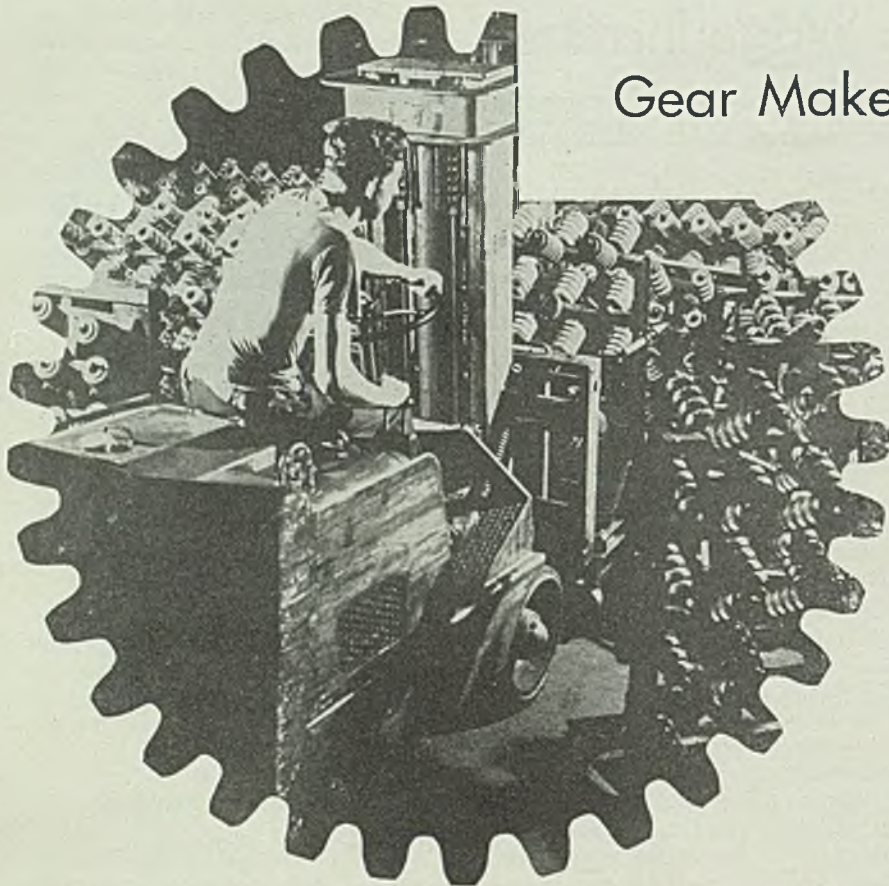
### ■ OCEAN SHIPPING RATES TO WEST COAST ADVANCED

WASHINGTON—Advances in vessel transportation charges up to \$7 per 100 pounds for steel products on shipments from Atlantic ports to the West Coast have been authorized, effective Nov. 6. Similar advances on shipments from Gulf ports are effective Nov. 7.

### ■ INDUSTRIAL PRODUCTION INDEX REMAINS STATIONARY

WASHINGTON—The Federal Reserve Board's seasonally adjusted index of industrial production for September was unchanged from the August level of 177 per cent of the 1935-1939 average of 100 per cent.

## Gear Makers Review Postwar Research Projects



Completed gears are stacked on specially designed racks, then moved by Tow-motor lift trucks to storage to await shipment from the Warner Gear Division, Borg-Warner Corp., Muncie, Ind.

FOR the first time since wartime restrictions interrupted a schedule otherwise unbroken since 1917, the American Gear Manufacturers' Association staged a full-scale annual convention at Edgewater Beach Hotel, Chicago, Oct. 27-30. The meeting attracted 200.

A number of the delegates—including Thomas J. Bannon, Seattle, 1946-1947 president of the association—came from the West Coast, where manufacture of precision gearing and related products now is an important industrial activity.

Close relationship between the aircraft industry and the gear industry was indicated by the principal speaker on the engineering program, H. J. Clyman, assistant to manager of engineering, Aviation & Gas Turbine Division, Westinghouse Electric Corp., East Pittsburgh, Pa., dealt with "Jet Propulsion and Gas Turbines in Aviation." He is of the opinion that the gas turbine-propeller type of power plant—rather than the "rocket type" is the coming thing in commercial aviation.

He believes that within five years commercial airliners will be gas turbine driven. These turbines already have reached a high state of development. Heat-resisting materials, new types of

bearings and high speed gearing all have played important roles in the creation of compact and powerful gas turbines for aviation.

Among the research projects now underway by AGMA, one of the most interesting is that concerned with comparative rating of the machined (either by tools or by abrasives) surfaces of gear teeth. This undertaking, under the chairmanship of Louis D. Martin, gear engineer, Eastman Kodak Co., Rochester, N. Y., who heads up the Fine Pitch Gearing Committee, involves various methods of "analyzing" the gear tooth surfaces and the setting up of a series of known degrees of finish with which they can be compared visually or by instrument. Much work remains to be done but this project bids fair to be of major importance when developed to the stage where it can be put into practice.

Another session which inspired lively discussion was that on general research activities under leadership of John O. Almen, head of mechanical engineering department No. 1, General Motors Research Laboratories, Detroit. One subject Mr. Almen discussed was noise—its elimination or segregation. He pointed out that in many cases gears are blamed for noise

*First full-scale convention since 1941 held in Chicago. Manufacturers hear prediction gas turbines will power future commercial aircraft. Will require high-speed gearing*

which originates elsewhere—the gear case merely being a "sounding board" or amplifier.

Guest speaker at the luncheon was DeWitt Emery, president, National Small Business Men's Association. Mr. Emery blamed much of the trouble between management and labor on the fact that working people generally assume that for every dollar paid in wages, a dollar at least is being paid out in dividends. Actually, he said, the average is seven dollars in wages to one in dividends.

Few workmen, he added, realize that the average workman in the United States has behind his job more than \$6000 worth of investment in the business facilities—that is, machine tools, etc. Management has done a poor job of telling working people these and other "industrial facts of life," he contended.

Guest speaker at the dinner was David K. Stewart, vice president, Central National Bank, Cleveland.

The 1947 annual meeting of AGMA will be held at the Homestead, Hot Springs, Va., in the spring.

### MEETINGS . . .

- Nov. 7-8, National Founders Association: Convention, Waldorf-Astoria Hotel, New York.
- Nov. 7-8, Industrial Management Society: Annual National Time & Motion Study Clinic, Continental Hotel, Chicago. Ralph H. Landes, 1766 W. Adams St., Chicago 3, is clinic chairman.
- Nov. 7-8, Society of Automotive Engineers: National fuel and lubricants meeting, Mayo Hotel, Tulsa, Okla. John A. C. Warner, 29 West 39th St., New York 18, secretary and general manager.
- Nov. 8, American Foundrymen's Association: Philadelphia chapter meeting, Engineers Club, 1317 Spruce St., Philadelphia. Secretary-treasurer of the chapter is W. B. Coleman. W. B. Coleman & Co., Philadelphia.
- Nov. 8-9, National Welding Supply Association: Fall meeting, Cedar Rapids, Iowa. Association headquarters are at 324 East Second St., Dayton 2, O.
- Nov. 14-15, Steel Products Warehouse Association Inc.: Fifth annual convention, Detroit. Association headquarters are at 1080 Union Commerce Bldg., Cleveland 14.



WILLIAM R. WHITE JR.



WILLIS G. EHRHARDT

## Die Shops Seen Offering Big Market for Precision Tools

*Speakers at convention of National Tool & Die Manufacturers Association point out that wear-and-tear of war has taken toll of equipment. New officers elected; code of business conduct adopted*

DELEGATES representing a large proportion of the 450 leading contract tool and die shops constituting the membership of the National Tool & Die Manufacturers Association gathered at the Congress Hotel, Chicago, Oct. 23-26, for the first full-scale national meeting in the history of the association. The representative attendance, placed at about 300, demonstrated that in less than five years the association has grown to be an active and a strong organization in the metalworking field.

As emphasized by the retiring two-term president of NTDMA, Richard F. Moore, president, Moore Special Tool Co. Inc., Bridgeport, Conn., membership in the association is made up of companies typifying "small business" in its most virile form. The average contract tool and die shop employs from 20 to 35 expert men and operates on rather limited capital. There are something like 5000 shops of this kind in the United States.

Mr. Moore also pointed out that the wear-and-tear of the war years now make the tool and die industry a big potential market for precision machine tools.

Numerous committee reports presented during the convention give some idea of the scope of current NTDMA activities. These include: Apprenticeship; business conduct; fact-finding; government relations; industrial relations; and publicity. Among other important actions taken was the unanimous adoption

of a code of business conduct which is a model of forthrightness and simplicity.

The manner in which the tool and die industry now affects national life and security was brought out forcefully by Dr. Harrison S. Brown of the University of Chicago, in his address entitled "Realities of Atomic Energy." Dr. Brown, who was one of the top-flight scientists on the now famous Manhattan project, revealed that tooling of extraordinary difficult and exacting and unusual nature was involved both in the preparation of the substance for the bombs and also in the construction of the mechanisms of the bombs. He sounded a grave warning that only in international understanding and in international control can the evil of atomic energy be avoided and the good made adequate use of. In his estimation, others than our own specialists will have discovered the so-called atomic secrets within five years.

The final general session was devoted to two forums which created keen interest and brought out many useful suggestions. The first was on "Developing Specialties in Tool and Die Shops." This was dealt with in a series of brief talks given by George M. Jones, Ace Mfg. Corp., Philadelphia; John Kleinoder, John Volkert Tool & Die Co., New York; Jerome H. Stanek, Stanek Tool & Mfg. Co., Milwaukee; and Guy Hubbard, Machine Tool Editor, STEEL. The consensus of opinion was that while a solid backlog of regular production may be desirable, careful study should be made

to make sure that a large market can be tapped and that in so doing, tool and die customers are not competed with.

The other forum dealt with "Good Service on Special Tooling." Representing customers were: Bert Hall, tool supervisor, General Electric Co., Erie, Pa.; R. W. Updike, tool supervisor, Schwitzer-Cummins Co., Indianapolis; Robert C. Eisenmann, purchasing agent, Union Special Machine Co., Chicago.

Representing tool shops were: Frank W. Denning, Denning Mfg. Co., Cleveland; Joseph N. Huser, B & H Specialty Co., Indianapolis; and Richard F. Moore, Moore Special Tool Co. Inc., Bridgeport, Conn.

With Burnham Finney, editor, *American Machinist*, as moderator, these two groups engaged in a lively "give-and-take" contest. It finally resolved down to the conclusion that both would be better off if each takes the other fully into confidence—users in revealing what the tools are for, and makers in presenting well documented quotations based on real engineering rather than on snap judgment.

New officers elected for 1946-47 are: President, Willis G. Ehrhardt, Ehrhardt Tool & Machine Co., St. Louis; first vice president, William R. White Jr., vice president, Midwestern Tool Co., Chicago (also president of Chicago Tool & Die Institute); second vice president, J. J. Kohl, the International Tool Corp., Dayton, O.; treasurer, Herbert F. Jahn, the B. Jahn Mfg. Co., New Britain, Conn.; secretary, John H. Benetz, Bridge Tool & Die Works, Philadelphia.

## Materials Handling Show To Be Held in Cleveland

The first exposition to deal entirely with industry's materials handling problems will be held at the Public Auditorium, Cleveland, Jan. 14-17, Earl I. Burke, manager of shipping, Republic Steel Corp., and chairman of the packaging and loading committee of the American Iron & Steel Institute, announced recently.

Mr. Burke, who is chairman of the policy committee of the first National Materials Handling Exposition, declared that the show will furnish the first opportunity for production, distribution and warehousing representatives to view at one time all methods for materials handling.

A four-day program of papers and discussions will be held concurrently and will feature specialists from the following fields: Aviation, automotive, beverages, canning, ceramics, chemicals, electrical, farm equipment, foundries, iron and steel, meat packing, paper, railroads, rubber, textile, warehousing, general machinery, bulk materials and chain stores.

# Fabricators' Outlook Promising But Shortages Must Be Overcome

*Speakers at annual convention of American Institute of Steel Construction point to huge pentup demand for construction. President Paul Coddington says steel producing facilities to be taxed to utmost in coming era*

TRADE REPORTS indicate steel production facilities will be taxed to the utmost in the coming era of construction, Paul Coddington, president, American Institute of Steel Construction, said last week speaking at the annual convention of the organization at San Diego, Calif.

This was the first national meeting of the institute ever held on the Pacific Coast and in the words of Mr. Coddington, "should mark the beginning of our institute activity and influence on a truly national scale." Mr. Coddington is president of the Lakeside Bridge & Steel Co., Milwaukee.

Discussing the outlook for the structural steel fabricating industry, President Coddington pointed out the federal government is planning flood control, power development and national highway construction on a huge scale; that every state has an ambitious highway program to bring roads and bridges up to date.

In his report to the convention as executive vice president of the institute, Robert T. Brooks said that while there is undoubtedly a large pentup demand for the structural steel industry's products, the immediate outlook is confused.

"With materials still under control and the large number of strikes in progress or threatened," he said, "it would seem that only the most urgent work can proceed at this time. Just a few days ago the Civilian Production Administration announced a plan limiting civilian and federal non-residential building construction to \$35 million per week."

## Bookings at About Prewar Rate

Mr. Brooks pointed out that in the five prewar years, 1936 to 1940 inclusive, the annual average of nonresidential work was estimated at \$1,607,000,000, which is about the same rate as the program determined on by the CPA. Average annual bookings of the industry during those five years were estimated at 1,500,000 tons. The average bookings for the first seven months of this year were estimated at 120,000 tons per month which is at approximately the same monthly rate as that booked in the five-year period, 1936-1940.

With the coming of peace the institute is concentrating its attention on normal activities, Mr. Brooks said. These activ-

ities briefly include: Furthering of better methods in design, fabrication and erection of structural steel; promotion of the industry by expanding its possibilities and its markets; establishment and promotion of business standards and the bringing about of uniform trade customs within the industry; increasing the fund of useful engineering knowledge and promotion of the science and the art of steel construction through technical research; dissemination of pertinent statistical information; development of cost data; fostering better conditions and business relationships.

Reporting to the convention on the activities of the technical staff, T. R. Higgins, director of engineering, said that during the past year there has been a complete restudy of the published technical standards of the institute with con-

sequent revisions where deemed advisable.

Stressing the need for continued research, Mr. Higgins said: "In the future immediately ahead of us, the demand for fabricated structural steel will no doubt continue at a level which can lull us into a false sense of security. To some the need for research at this time will not seem pressing. The more prudent, however, will train their sights higher, to the period following this first release of the long pentup demand for new construction, when the fruits of competitive selling will go to those who have the most to offer. In anticipation of that time we should leave no stone unturned right now in formulating the most effective possible program of research."

Volume of heavy construction this year will be limited in large measure by the availability and allocation of materials, T. H. Hendrix, director of statistics, told the convention delegates.

Backlog of heavy engineering construction increased from \$28 billion in December, 1945, to \$32,572,000,000 in July, 1946, Mr. Hendrix said. Included in this backlog are \$1,210,000,000 for bridges, over \$2 billion for industrial buildings, \$2,900,000,000 for commercial buildings and over \$6 billion for different types of public buildings.



**POSTWAR DIESEL VERSATILE:** Quantity production has been started on the F3, the wide-range diesel-electric locomotive which Electro-Motive Division, General Motors Corp., La Grange, Ill., has been demonstrating confidentially on American railroads for 14 months. By simple change of gear ratios, the 6000-horsepower diesel can be equipped to pull the heaviest freight trains at maximum speed of 50 to 65 miles an hour or for heavy-duty passenger service capable of pulling long, standard-weight Pullmans at 102 miles an hour, negotiating most mountain grades without a helper. Based on demonstration tests, 30 railroads had placed orders for a total of 1,177,500 horsepower before production was started

## WAA's Machine Tool Pricing Order Censured

*Builders say "breakdown" of Clayton formula will result in loss of over \$80 million to public*

MACHINE tool builders are protesting vigorously the War Assets Administration's action in establishing fixed prices for about \$350 million worth of surplus government-owned machine tools.

This affects about 65 per cent of the total offered for sale and will result in a complete breakdown of the Clayton formula of pricing machine tools, industry spokesmen say. The formula provided a graduated scale of prices based on depreciation.

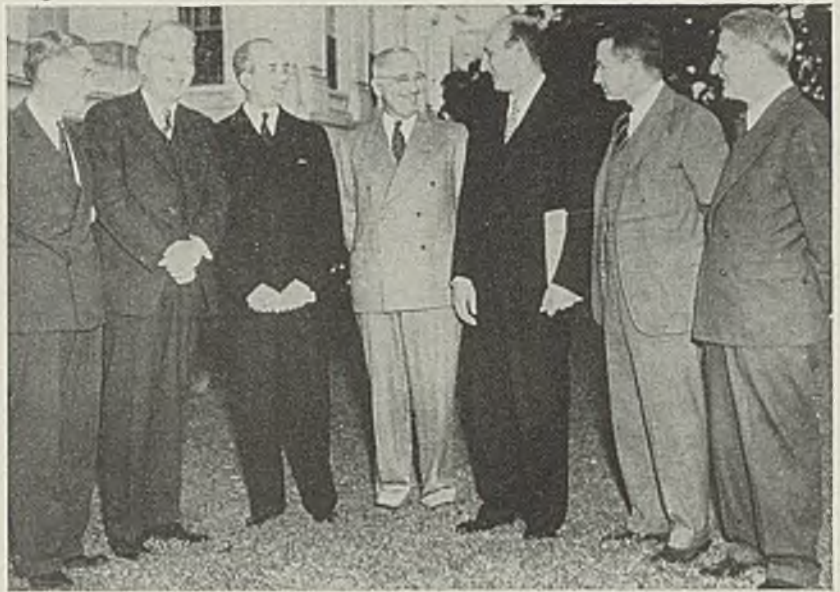
Under the new pricing policy, it will be possible for "speculators" to purchase large quantities of machine tools at a low cost (in many instances as low as 20 cents on the dollar) and resell them later at inflated prices, according to members of the industry. Gross inequities have been made in fixing prices, they claim, since some machines which are in tight supply are offered at low prices while some machines that are in light demand are still priced under the Clayton formula at comparatively high prices.

This situation will hamper disposal of machine tools under the Clayton formula since prospective buyers will be inclined to wait for possibility of their being placed on a fixed-price basis at a lower level. It was pointed out in the trade that the recovery value to the government of machines sold under the Clayton formula was about 48 per cent compared with the 25 per cent recovery which is expected under the fixed-price basis. The loss to the public will be over \$80 million on sales of machines now under the fixed-price schedule.

Consensus among machine tool builders is that WAA should have made serious, businesslike efforts to correct the incompetent administration of the surplus machine tool disposal program and to provide service to prospective buyers.

### OPA Revises Provision in Machine Tool Price Order

Sellers of brand-name machine tools, who do not manufacture the machine tools they sell, have been provided with a new method of fixing their maximum



**CIVILIAN ATOMIC COMMITTEE:** Appointment of an all-civilian Atomic Energy Commission by the President last week paved the way for removal of atomic energy development from military control. Chairman of the new commission is David Lilienthal, for the past five years chairman of the Tennessee Valley Authority. Lilienthal is succeeded as TVA chairman by Gordon E. Clapp. Shown in photo here are, left to right: Mr. Clapp; Sumner T. Pike, former SEC commissioner; Lewis L. Strauss, New York banker; President Truman; Mr. Lilienthal; R. F. Bacher, Cornell University physicist; W. W. Waymack, editor, Des Moines Register & Tribune. NEA photo

prices. Effective Nov. 2, such sellers who are unable to establish ceiling prices for their products because their suppliers have never issued list prices may fix their ceiling prices at the total of their net invoiced acquisition costs plus their Mar. 31, 1946, mark-up. If the seller had no established mark-up on that date, he must submit his proposed mark-up to OPA for approval.

### 630,000 Gallons of Cutting Oil Offered for Sale

Machine tool shops now can obtain high grade cutting oils at low prices, War Assets Administration announced last week, in offering for sale 630,090 gallons. Costing the government nearly \$400,000, the oils are offered at a fixed price of 20c to 30c a gallon, fob point of shipment. Minimum quantity of purchase is five drums (55 gallons each) except where specific items may be packed in smaller containers, in which case the minimum purchase may be 200 gallons.

### Industrial Buying Policy Reported More Cautious

Industrial buyers are becoming increasingly cautious in their buying policy, the

National Association of Purchasing Agents, New York, reported last week.

Current general policy is about a three-months position, with variations in different items, the goal being to keep inventories in balance with demand, supply and deliveries.

Reports indicate a slight drop in the current over-all inventory situation, the association said, pointing out that deliveries are not improving and that inability to get suitable deliveries tends to reduce inventories in some plants and to unbalance them in others.

Work-in-process inventories are becoming difficult to control, due to the short supply of many items necessary to the completion of the finished product, and the purchasing agents association expects little change in this picture for the rest of 1946.

Industrial buyers as a whole, the association said, desire to reduce or balance inventories. This tendency is accelerated because higher prices are meeting resistance for the first time since the war. There also is a very definite resistance to long-term commitments at the price prevailing at time of shipment. Also, many buyers are deferring forward commitments for 1947 beyond the first quarter, awaiting a clarification of the supply situation.

# U. S. Steel's Financial Report Reflects High Operating Rate

*Net profit was \$33,329,353 in third quarter when steel production rate of corporation's subsidiaries was 94.3 per cent of capacity, compared with \$13,900,270 in second quarter when operating rate was 57.7 per cent*

HIGH RATE of operations enabled United States Steel Corp. to show net profit of \$33,329,353 for the third quarter of 1946, compared with \$13,900,270 in the second quarter and \$10,238,271 in the first quarter. Net profit in the third quarter of 1945 was \$11,624,420.

Total net profit for the first nine months of 1946 was \$57,467,894, compared with \$43,777,793 in the corresponding period of 1945.

Indicative of the high level at which the corporation's subsidiaries operated is the steel ingot and castings production rate, which in the third quarter of 1946 was 94.3 per cent of rated capacity. In the second quarter of 1946 the rate was 57.7 per cent, and in the first quarter, 52 per cent.

Shipments of steel products in the third quarter of 1946 totaled 4,457,557 net tons. Eliminating periods in which shipments were largely for war or emergency purposes, this tonnage of shipments was exceeded in only one peacetime quarter in the history of U. S. Steel, the second quarter of 1929.

Unfilled steel orders of the corporation amounted to about six months' production at the current rate of operations, Chairman Irving S. Olds said.

Responding to a question, he said that the corporation had not cancelled any portion of its expansion program (the question apparently had been put with cancellations of certain other industrial companies in mind), but that work had been delayed because of shortage of labor and materials.

Asked how much the wage increases earlier in the current year were costing the corporation, Mr. Olds said that in the third quarter, a fairly stable period, the cost was around \$26 million, although this didn't include certain items which will have to be taken into account, such as the royalty of 5 cents per ton for miners' welfare funds.

## Bethlehem Steel Corp.

Net profit of Bethlehem Steel Corp. for the September quarter was \$10,543,005 compared with \$7,761,667 in the like quarter of 1945 which included an income tax credit of \$34,980,000 due to write-off of emergency facilities. In the

June quarter this year the corporation reported net profit of \$14,447,207.

Net profit for the first nine months this year was \$29,794,650 compared with \$23,499,258 in the like 1945 period.

Current ingot operations of the corporation are reported at 95 per cent of capacity, while operations for the third quarter averaged 97.9 per cent against 87.4 per cent in the preceding quarter.

## Portsmouth Steel Corp.

Portsmouth Steel Corp., Portsmouth, O., reported net profit of \$417,850 for the quarter ended Sept. 30. This was the first quarterly report since the new company began operations on July 1. Net sales for the three months totaled \$7,526,978.

## Youngstown Sheet & Tube

Third quarter net profit of the Youngstown Sheet & Tube Co., Youngstown, was \$4,871,852, compared with \$3,099,099 in the second quarter and \$1,205,444 in the first quarter of this year. In the third quarter of 1945 the net profit was \$1,627,080.

Net profit for the first nine months of 1946 totaled \$9,176,395, compared with \$5,635,027 in the corresponding period of last year.

## Jones & Laughlin Steel Corp.

Jones & Laughlin Steel Corp., Pittsburgh, had net profit of \$2,952,716 in the third quarter of 1946, an increase over the net profit of \$2,343,298 in the second quarter and the net profit of \$813,246 in the first quarter. Third quarter net profit in 1945 was \$1,343,295.

Net profit for the nine months ended Sept. 30, 1946, totaled \$6,109,260, compared with \$5,714,308 in the corresponding period of last year.

## Wheeling Steel Corp.

Reporting for third quarter of 1946, Wheeling Steel Corp., Wheeling, W. Va., said it had a net profit of \$2,085,120. Second quarter net profit was \$1,080,266, and first quarter net profit was \$22,655. In the third quarter of 1945 there was a net profit of \$1,085,887.

Net profit for the first nine months of

1946 totaled \$3,188,041, compared with \$3,419,478 in the corresponding period of 1945.

## Crucible Steel Co. of America

Crucible Steel Co. of America, New York, reported net profit of \$215,436 for third quarter of 1946, compared with net profit of \$1,695,034 for the second quarter and net loss of \$1,742,750 for the first quarter. In the third quarter of 1945 the company had net loss of \$1,734,895.

## American Rolling Mill Co.

The American Rolling Mill Co., Middletown, O., reported that its third quarter net profit was \$5,466,068, bringing its net earnings for the first nine months of 1946 to \$12,488,684.

Net profit in the second quarter was \$5,218,129 and in the first quarter, \$1,804,487. In the third quarter of 1945, net profit was \$1,460,795, and for the first nine months of 1945, \$5,408,223.

## Inland Steel Co.

Net income of \$4,927,473 for the third quarter of 1946 was reported by Inland Steel Co., Chicago. This was an increase over the net profits of \$3,926,342 in the second quarter, \$1,046,958 in the first quarter, and \$2,016,017 in the third quarter of 1945.

Total net income for the first nine months of 1946 was \$9,900,773, compared with a net income of \$7,228,617 in the corresponding period of 1945.

## National Steel Corp.

National Steel Corp., Pittsburgh, showed a net profit of \$6,254,976 in the third quarter of 1946, compared with net profits of \$5,602,988 in the second quarter and \$2,083,356 in the first quarter. Third quarter net profit in 1945 was \$2,027,502.

For the first nine months of 1946 the corporation's net profit was \$13,941,320, compared with \$8,910,673 in the first nine months of 1945.

## Colorado Fuel & Iron Corp.

The Colorado Fuel & Iron Corp. and subsidiary companies, Denver, reported a net profit of \$1,025,126 for the quarter ended Sept. 30, the first quarter of the company's fiscal year.

In the quarter ended June 30, there was a net profit of \$1,743,199, but in the quarter ended Mar. 30 there was a net loss of \$1,667,932. In the quarter ended Sept. 30, 1945, there was a net profit of \$42,196.

## Allegheny Ludlum Steel Corp.

Declining slightly, net income of Allegheny Ludlum Steel Corp., Pittsburgh, in the third quarter of 1946 was \$2,113-

012, compared with a second quarter net income of \$2,194,085. First quarter net income was \$252,042. Net income in the third quarter of 1945 was \$537,079.

For the first nine months of 1946 net income totaled \$4,559,139, compared with \$2,500,866 in the corresponding period of 1945.

#### Acme Steel Co.

Acme Steel Co., Chicago, reported net profit of \$1,211,685 for the third quarter of 1946. In the second quarter of the year the net profit was \$1,029,665, while in the first quarter the net profit was \$679,329. For the third quarter of 1945 the net profit was \$450,995.

Net profit for the first nine months of 1946 totaled \$2,920,679, compared with \$1,564,866 in the corresponding period of 1945.

#### Rotary Electric Steel Co.

Decreased net profit was reported for the third quarter of 1946 by Rotary Electric Steel Co., Detroit. Net profit for that period was \$109,073, compared with \$229,091 in the second quarter and \$54,429 in the first quarter of this year. Third quarter net profit in 1945 was \$27,347.

For the first nine months of 1946 the net income totaled \$392,593, compared with \$286,067 in the corresponding period of 1945.

#### Sharon Steel Corp.

Net profit of \$1,493,715 for the third quarter of this year has been reported by Sharon Steel Corp., Sharon, Pa. In the

second quarter of the year the company had a net profit of \$291,974, while in the first quarter it sustained a net loss of \$343,339. For the third quarter of 1945 the company reported a net profit of \$176,856.

Net profit for the first nine months of 1946 totaled \$1,442,350, compared with \$843,409 in the corresponding period of 1945.

#### Keystone Steel & Wire Co.

Keystone Steel & Wire Co., Peoria, Ill., reported for the quarter ended Sept. 30, 1946, the first quarter of its fiscal year, net profit of \$918,144, the largest first quarter earnings in the company's history. In the corresponding quarter last year, the company's net profit was \$285,139.

For the quarter ended June 30, 1946, the company had net profit of \$758,581, and for the quarter ended Mar. 31, 1946, a net profit of \$528,901.

#### Alan Wood Steel Co.

Improvement in net earnings is shown in a third quarter report from the Alan Wood Steel Co., Conshohocken, Pa.

In that quarter the company's net earnings were \$463,515, compared with a net profit of \$130,047 in the second quarter and a net loss of \$263,422 in the first quarter of this year. Net earnings in the third quarter of 1945 were \$16,161.

Total net income for the first nine months of 1946 was \$330,140, compared with \$82,226 in the corresponding period of 1945.

## Price Decontrol Action Being Speeded by OPA

*Long list of products removed from regulation, including a few steel items. New labor policy seen in development*

DECONTROL of the economy moved into high gear last week as the Office of Price Administration announced removal of a long list of materials and products from control. At the close of the week an additional list of items was being worked on as the administration, facing a new wage crisis, sought to speed up decontrol.

Publication of a master list of materials and products which would remain under control for the time being, originally scheduled for Nov. 1, however, has been temporarily delayed. Explanation for the delay was not forthcoming but the view was expressed in informed circles it possibly was tied in with the administration's effort to develop a new labor policy. The thought most widely held was the government desires to remove itself entirely from the wage question, leaving disposition of impending wage controversies to collective bargaining. To do this, however, the administration recognizes it must remove control on prices to the fullest possible extent.

Alloy steel and tubing, iron ore shipped on or after Jan. 1, 1947, silver, radio parts and various automotive, rubber, drug, lumber and consumer goods products were removed from price control last week, because, as OPA announced, these items are in approximate supply-demand balance. The action, effective Nov. 1, also removed from control alloy steel products; steel wire rope and strand; alloy tool steel rolled products; and alloy specialty steel; trucks of a maximum gross rate rating of around 16,000 pounds, 2-ton or larger; and commercial truck trailers designed for on-the-highway use.

Removal of tool steel rolled products and alloy tubing, alloy specialty steel and steel wire rope and strand will not impair effective control of the remaining segments of this group, it was said.

On the list of consumer durable goods removed from price control are radios and electric phonographs, typewriters, business machines, office equipment, photographic supplies, watches and clocks, table flatware and kitchenware. Also included were lamps, glassware, and such electrical appliances as heaters, irons, hot plates, and electric heating pads.

## GOVERNMENT CONTROL DIGEST

### OFFICE OF PRICE ADMINISTRATION

**Price Control Exemptions:** Sales and deliveries of the following metals and minerals, when sold by Reconstruction Finance Corp. or subsidiaries for export, have been exempted from price control, effective Oct. 24: Antimony, metal and oxide; copper; corundum; lead; manganese ore; nickel; zinc; quartz crystals; and asbestos.

Effective Oct. 30, numerous consumer durable goods, including small or heavy forged iron and steel hand tools, as well as small appliances, small model radios, metal kitchenware, etc., have been exempted from price control. All major electric appliances such as refrigerators and electric ranges are not included.

Effective Oct. 25, the following items have been exempted from price control: Acoustically amplified phonographs; stepladders; outboard motors; finished and semifinished lenses for optical, ophthalmic and scientific use; eye glasses, spectacles and frames and mountings for eye glasses, spectacles and sun glasses; hand-operated washing machines; carving and kitchen knives and forks; nonelectrical food choppers and extractors; oil, kerosene or gasoline lanterns and mantle lamps; incandescent mantles; oil hurricane lamps. (SO-188, MPR-188 and SO-126; OPA-T-5134, OPA-6899)

**Low-End Consumer Durable Goods:** A number of kitchen furnishings, including utility tables, utility cabinets and cupboards, have

been added to the "low-end" order that permits manufacturers to apply for increased prices on goods in their lowest price lines, effective Oct. 22. This order restricts the manufacturer to the lowest of the following prices: The dollar-and-cent price given in the order for sales to jobbers; his current ceiling price plus a stated percentage increase; or his total cost to make and sell the item plus a stated percentage for profit. (MPR-148; OPA-T-5108)

**Machine Tools:** Effective Nov. 2, sellers of brand-name machine tools, who do not manufacture the machine tools they sell and who are unable to establish ceiling prices for their products because their suppliers have never issued prices, may fix their ceiling prices at the total of their net invoiced acquisition costs plus their Mar. 31, 1946, mark-up. If any seller had no such mark-up on that date, he must apply to OPA for approval of his proposed figure. (MPR-1 and 67; OPA-T-5123)

**Plumbing Fixtures:** Manufacturers' ceiling prices increased 11.5 per cent on enameled cast iron plumbing fixtures, effective Oct. 30. (MPR-591; OPA-6914)

**Steel Drums:** Manufacturers given formula for computing maximum prices for drums made of cold-rolled steel to be used in cases where they do not have established ceiling prices for these containers. Manufacturers eligible to use the formula will substitute the cost of cold-rolled steel for the cost of the hot-rolled steel in computing their new maximum prices, effective Nov. 4. (GMFR; OPA-T-5142)

*Preparedness to continue big business. Fears that Army and Navy appropriations might be cut drastically allayed by administration. Research and development work under contract with industrial organizations to be maintained*

FEARS of substantial reductions in Army and Navy maintenance and procurement programs have been allayed by President Truman's assurance that no cuts beyond those ordered Aug. 2 have been made or are under consideration.

The services now are discussing with the Bureau of the Budget the details as to how the Aug. 2 cut of \$650 million to \$5 billion—for the Navy, and \$1 billion—to \$6 billion—for the Army will be effected. But it is the White House wish that these economies be effected by eliminating unnecessary bases and in other ways that will not prevent the two service forces from being kept as "strong instruments of foreign policy." No reduction in procurement of essential material, or in research and development work under contract with institutions and industrial organizations is planned.

This situation is comforting in view of the thin ice over which we continue to skate in our dealings with the Russians. The general view in Washington is that we are at war with the Russians—not a shooting war as yet but, rather, political and ideological warfare, and wherever we encounter the Russians we run into ever deepening trouble of their making. Nevertheless, there has been a continuous policy on the part of the administration to give out the impression that, "yes, we are having disagreements with the Russians but we have the situation under control." Therefore official Washington was rather surprised at the blunt character of the speech of welcome with which President Truman greeted the representatives of 51 nations in attendance at the United Nations General Assembly meeting in New York.

## Demands Four Freedoms

Apparently the public received as most significant the President's statement that fears of another world war "are unwarranted and unjustified." Actually the speech was the strongest expression of United States foreign policy yet made. It bristled with passages the Russians did not like. For example, the President insisted that the coming peace settlements will have to be based on the four freedoms—speech, religion, fear and want—and he called for an end to propaganda "that promotes distrust and misunderstanding among the Allies." He got in a body blow against veto abuses by reaf-

firming the American doctrine that the small nations are represented in the Assembly as equals and that "wisdom is not the monopoly of strength or size."

The President's speech made it clear that the Truman administration does not intend to tolerate "the use of force or the threat of force anywhere in the world to break the peace."

All of which boils down to the firm assurance that maintaining and building up our preparedness for war will be big business in the United States for at least a considerable period ahead.

In Army and Navy circles, no immediate changes are expected to result from the President's new assignment to Richard R. Deupree, executive chairman of the Army and Navy Munitions Board. It charges him with responsibility "for making final decision in matters pertaining to the allocation of joint procurement responsibility between the Army and Navy." During World War II, as one of many examples, the Navy procured the food consumed by the Army in most Pacific theaters. By allocating responsibility for joint procurement programs Mr. Deupree will eliminate some of the

duplication and friction which has occurred on occasion in the past. But his decisions under the new directive will have no effect on the purchase programs in themselves.

Materialization of one move now under consideration that would afford great satisfaction to the military is elevation of Secretary of the Navy Forrestal to the position of secretary of state. While Secretary Byrnes has won great prestige for his work with the State Department it has been exhausting and he has been warned by his physician to take things easy. There is a 50-50 chance of his resignation following the United Nations General Assembly meeting in New York. While no official word has been given out, it is known that Mr. Forrestal is being considered to succeed Mr. Byrnes.

## Guaranteed Wage Studied

Two reports on the subject of guaranteed wage systems are due in November. One is an interim report by the Guaranteed Wage Study Staff of the Office of War Mobilization and Reconversion Advisory Board; this is the setup charged by the late President Roosevelt with the assignment of looking into and reporting on the feasibility of wider adoption of guaranteed wage systems. This report is due Nov. 12.

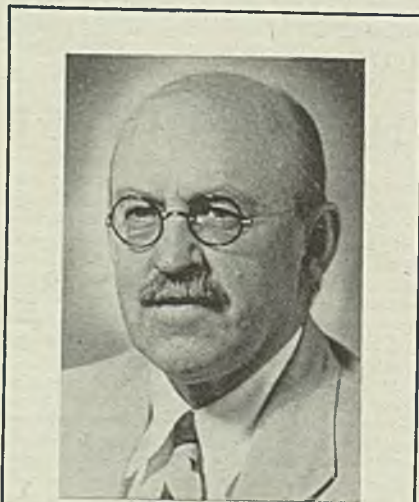
The other report will be by Dr. A. D. H. Kaplan of the Brookings Institution, Washington, on the same subject and will represent the data obtained in an investigation over the past year.

The report of the Guaranteed Wage Study Staff on the OWMR Advisory Board will be based to a large extent on the findings of field agents of the Bureau of Labor Statistics and will reveal what these men picked up in talking with representatives of industry on the subject. In general, they encountered difficulty in obtaining helpful information. Despite earnest efforts, they say, they were unable to get anything helpful from the steel industry.

## More Engineers Needed

Recent survey by the American Society for Engineering Education indicates there is going to be great competition for the services of engineering graduates.

Society figures 337,000 engineers will be needed to service the economy in 1950. This means a gain of 76,000 is needed over the 261,000 engineers available in 1940. The attrition by death over the decade is figured at around 78,000 or about 3 per cent a year, which means that an addition of 154,000 engineers is needed in the decade. The engineering



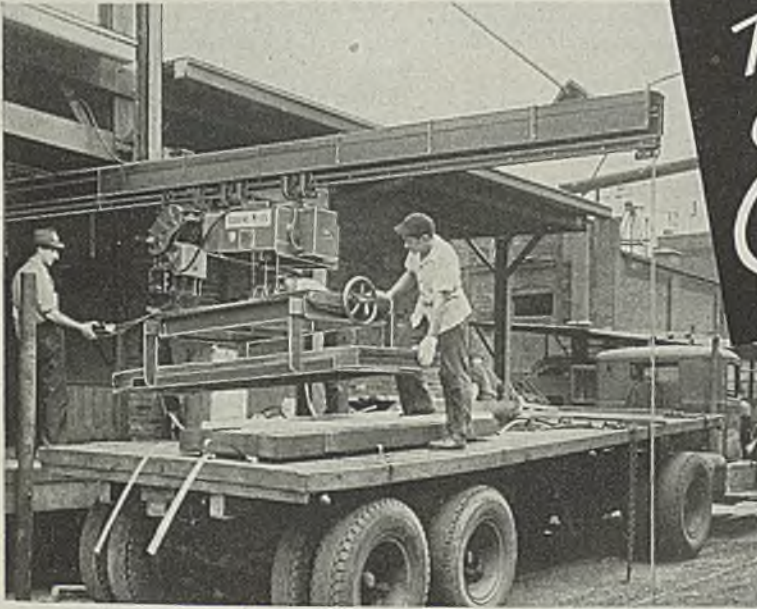
RALPH E. FLANDERS

*Republican nominee for the full six-year term in the United States Senate, Mr. Flanders has been appointed senator from Vermont to fill the unexpired term of Warren R. Austin, who has resigned to become American representative on the United Nations Security Council. Mr. Flanders is chairman of the board of Jones & Lamson Machine Co. and president of the Federal Reserve Bank of Boston*

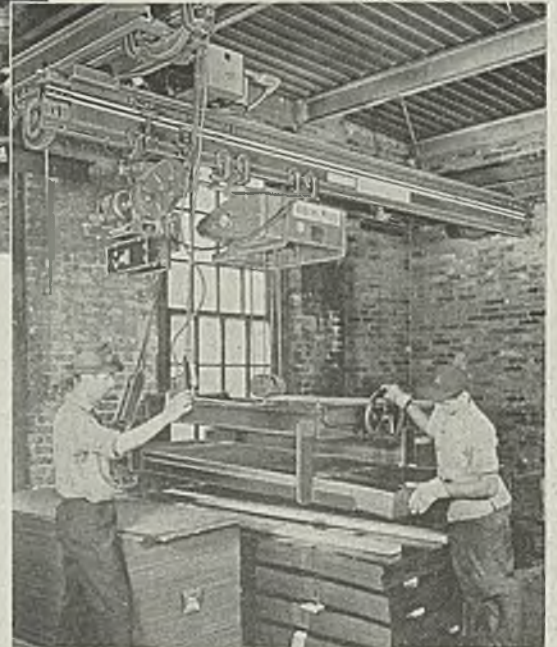


# HANDLING STEEL

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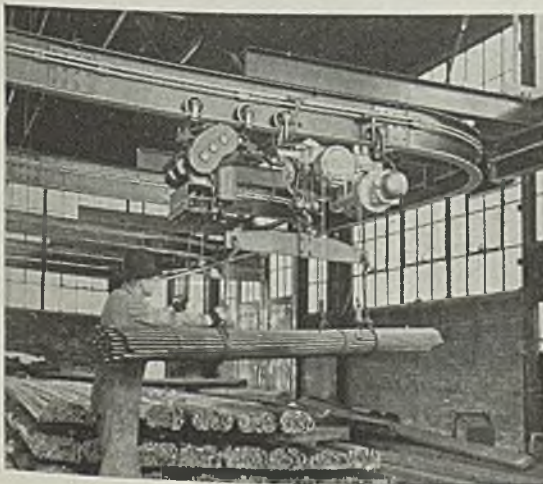
Power operated unit unloads steel by pushbutton control



Electric hoist with special hook, handles coils to process.



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American MonoRail Equipment saves one company \$20 on every truck unloaded; another saved \$150 in the first four months. With thousands of installations to draw from, American MonoRail Engineers are well qualified to offer solutions involving overhead handling equipment. This service is offered without obligation.



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schools have graduated 64,000 engineers in the years 1941-1946. That means that 90,000 engineers will have to be made available during the years 1946-1950. It means the addition of new engineers will have to be nearly at an average of 22,500 per year.

On the basis of the number of young men likely to be graduated by the engineering schools, the society estimates, it will take until 1952 to provide enough new engineers to wipe out the deficit.

The 85,000 students enrolled at engineering schools in April of 1946 were distributed over the curricula in the following percentage ratio: Aeronautical 4.9; chemical 9.6; civil 10.9; electrical 20.5; mechanical 21.2; mining and metallurgy 2.1; other 30.8.

### Dismissals To Increase

Bad news for many government employees is contained in a Bureau of the Budget notification to the Civil Service Commission that "firings" from the federal payrolls are to be much larger than hitherto envisioned. Congress (STEEL, Aug. 19, p. 76) ordered the federal payroll to be reduced to 1,600,000 employees by July 1, 1947, which would mean the firing of 700,000 government workers by that date. Since then the idea had been current that the huge severances by the Army and Navy would take the heat off the program as a whole. Now the Bureau of the Budget program calls for dismissal of 800,000 instead of 700,000 involved in the program approved by Congress. It is one of the tangible results from a recent economy move at the White House.

### Scarce Metal Inventories

Reconstruction Finance Corp. Office of Metals Reserve inventory figures as of Sept. 30 for the scarcer metals are: Copper 184,188 short tons, tin 54,502 tons, lead 38,837 short tons, zinc 549,801 short tons.

### Navy Steel Specifications

Postwar steel specifications of the Navy Bureau of Ordnance are based on the prewar premise that steel should be ordered to physical characteristics and that compositions should not be specified unless there is special reason to do so.

This policy was abandoned during the war, according to a spokesman, "because we were doing business with a lot of contractors unaccustomed to dealing with the Navy, and who insisted on having definite specifications against which to order steel for Navy work. In returning to the prewar practice of specifying

the physicals we are re-establishing a set-up under which the contractor has the greatest possible freedom in procuring steel which can be fabricated into end products that will be acceptable to the Navy.

Under a directive signed by Vice Adm. G. F. Hussey Jr., chief of the bureau, procurement will be under the following specifications, in the order of precedence indicated: Federal, Joint Army-Navy, Army-Navy Aeronautical, Navy Department, Bureau and Office, and some others. The preference of A-N Aeronautical specifications over Navy Department and Bureau of Ordnance specifications applies only to aeronautical material, including aviation ordnance.

Admiral Hussey's directive warns that vigilance must be exercised to insure that the specifications used will "indeed" result in the procurement of materials suitable in all respects for the specific application.

"The possession of all the desired characteristics and the absence of disqualifying defects or deficiencies," it says, "must be positively required by the specification and enforced by adequate inspection and test requirements when material other than that of the lowest commercial grade is required.

"In general, chemical composition alone is not sufficient as an indication of the suitability of metals for uses in which the possession of certain physical characteristics is necessary. Where practicable without sacrifice of desired characteristics of the device into which the material is to be incorporated, and without interference with the process by which it is to be made, the members should be so designed that commonly available commercial material will be adequate. Where this condition obtains, and the lowest commercial grade of material which may be furnished can be tolerated, the material may be specified by employing a commercial designation commonly used in the trade, exercising care to be as specific, but only as specific, as the case demands, so that the use of a suitable material is assured but a choice among suitable materials is afforded the contractor when more than one commercial commodity or variety thereof is satisfactory.

"For instance, a washer might be equally suitable if punched from strip, sheet, plate or bar stock, or if turned from a round bar, pipe or tube. Hot-rolled sheet may be satisfactory material for an embossed or drawn part but the contractor may prefer to use a better product or finish. Cold-rolled screw stock is quite good enough for many parts and its use facilitates production on screw machines. However, finished parts made

of machinery steel will be at least as good and the material may be more available.

"In instances such as these 'steel' or 'mild steel' is a suitable designation. Such terms as 'brass, half hard,' 'steel SAE 1010 to 1025,' 'soft steel wire,' and 'copper, annealed,' are proper where adequate.

"Reference shall not be made to trade names, vendors' catalogs, of specifications set up by manufacturing organizations if satisfactory material or devices may be obtained by other means. Proprietary articles or materials may be specified by name only when a true certificate may be issued that 'this material (or article) and no other will answer for the purpose intended.'"

Information about the Navy's simplification and standardization program with respect to steels for naval aircraft is contained on page 98 of this issue.

### CPA Issues Directory of War Industrial Facilities

One hundred corporations operated \$16.5 billion worth of the country's war-built industrial plants, according to the final consolidated directory "War Industrial Facilities, July, 1940-August, 1945," released by the Civilian Production Administration. This was nearly 60 per cent of the total industrial capacity increase of about \$28 billion authorized during the five years. The directory includes authorization for 13,500 plant expansions and new plants.

Almost \$14 billion of the war-built manufacturing plants, \$11 billion of it publicly financed, was managed by 75 large corporations, the report revealed. The 25 firms which operated 42 per cent of the new service capacity were principally railways and utilities. The 75 firms which ran 60 per cent of the manufacturing plants included steel and other metals and metal fabricating concerns, chemicals, rubber, automotive, electrical, aircraft, oil, explosives and shipbuilding.

E. I. du Pont de Nemours and General Motors head the manufacturing list with more than \$1 billion worth of war facilities each added to their previous production capacity. Each of the 73 other large manufacturing firms listed controlled \$50 million or more of war plants. Topping the list of the 25 largest industrial service expansions, American Telephone & Telegraph Co. had almost \$400 million of new facilities authorized.

War plants added about one-third to the country's prewar manufacturing capacity, in terms of plant space and equipment.

# New Island Republic Offers 4-Year Tax Exemption to American Firms

*Philippines hope to attract American capital to help industrialize and develop islands' resources. Systematic exploration expected to reveal extensive mineral deposits. Country needs railways, highways, fishing and transport vessels*

TO ATTRACT American capital into the Philippine Islands, the Philippine Congress has provided complete tax exemption for new industries over an initial 4-year period.

The new republic maintains a Washington headquarters in an old converted mansion at 1617 Massachusetts Avenue where Dr. Urbano A. Zafra, economic adviser to President Roxas, is prepared to provide information on opportuni-

ties in the islands to interested American businessmen. Washington representatives of the islands hail their country as a new "western frontier for United States businessmen."

The main Filipino objective is a return of the high scale of living the islands enjoyed in the prewar days under American rule—when they were the envy of the entire Orient. To do this they will first push the products which

are in active demand in the United States and which have been the main supports for the Philippine economy in the past. In order of importance they are: Sugar, coconut oil, tobacco and tobacco products, embroideries, desiccated coconut, copra meal and cake, canned pineapples, cordage, hats, buttons.

For the long future the Filipinos have ambitious plans. Systematic exploration is expected to uncover extensive mineral resources. Already the Filipinos have the largest known iron ore and chromite deposits in Asia. Oil has been discovered on Cebu.

A great new industry, they believe, can be built up on ramie fiber whose value in the production of low-cost substitutes for linen and high-grade cotton fabrics already has been proven.

A great new fleet of boats is needed to revive the fishing industry and expand it as compared with prewar. Another fleet is needed for interisland shipping.

More railroads and highways are needed. Agriculture generally calls for mechanization. Numerous new airports, particularly a large national airport at Manila, are "musts."

## Service Center for Orient

These are a few of the prospects which should be attractive to American businessmen, the Filipino spokesmen say. But there is still another reason why many of them will do well to locate branch plants and distribution depots in the Philippines. They produce a map and point out that Manila or any one of half a dozen other Philippine cities is a good location for serving a large part of the Orient. They point out not only that the Filipinos know the Americans and like them but also that the new republic has started out with impressive political stability.

In addition to authorizing the award of \$620 million for Philippine rehabilitation, the 79th United States Congress voted other forms of assistance. Not the least is the training which hundreds of Filipinos are receiving in the U. S.

For the immediate future, Philippine imports from the United States will continue largely to involve these products, substantially in the order of their importance: Iron and steel products, cotton goods, mineral oils, automobiles and parts, tobacco products (the Filipinos prefer American cigarets), paper products, wheat flour, electrical goods, chemicals, drugs, dairy products, and many consumer goods items. The list will lengthen and will include capital goods items as the Philippines become industrialized on the basis of American capital.



*Manila, once proud "Pearl of the Orient," is only beginning to emerge from the ruin and destruction visited upon it during the war. Now temporary buildings are being constructed as the city strives to get back to normal. Above office building on the Escolta is typical of the destruction caused by bombings. NEA photo*

WARM AIR furnace manufacturers are well on the way to setting in 1946 a new record for shipments, which the National Warm Air Heating & Air Conditioning Association, Cleveland, estimates will be 600,000 units.

This total would be 16 per cent above the previous record of 517,610 in 1941, and 46 per cent above the 411,172 units shipped in 1940.

Only after overcoming many obstacles would the new record be possible, for furnace manufacturers, like most other makers of hard goods, are handicapped by shortages of materials and components.

The new record will not stand long, however, for the association expects shipments in 1947 to reach one million, assuming, of course, materials shortages will have been licked. Then for ten additional years yearly production and sales of warm air furnaces are expected to be a million.

The association bases its outlook on the belief that several million new homes will be built in the next five or six years and that replacements of worn-out heating units average 4½ per cent of the 8½ million existing installations.

Shipments of warm air furnaces in the first eight months of 1946 totaled 375,379. To reach 600,000 this year, shipments for each of the remaining four months of 1946 must average 56,155. Such a rate is not impossible of attainment, for August shipments totaled 62,070. Breakdown of monthly shipments in 1946, according to the U. S. Census Bureau, follows: January, 37,789; February, 39,664; March, 47,100; April, 43,186; May, 47,321; June 49,337; July, 48,912; and August, 62,070.

Data for the bureau's August report came from 155 manufacturers, who accounted for almost the entire production of warm air furnaces.

After declining during the depression years of the early 1930s, furnace shipments turned upward, a trend that was interrupted by the war. However, the uptrend was resumed in 1944 and is continuing. In fact, shipments in the first eight months of 1946 exceeded shipments for all of 1945. Trend of shipments in recent years is shown in the table:

#### WARM AIR FURNACE SHIPMENTS

Year	Shipments (units)	Year	Shipments (units)
1939	385,000	1943	172,917
1940	411,172	1944	281,938
1941	517,610	1945	372,974
1942	255,715	1946	600,000*

\*Estimated.

In 1940, 122,344 furnaces, or 29 per cent of total output, were gas and oil fired units. In 1941, gas and oil fired furnaces totaled 221,464 units, or 42 per cent of total production, and in the first eight months of 1946 they amounted to

## 1946 Warm Air Furnace

Producers are expected to deliver 600,000 units this year, compared with previous record of 517,610 in 1941. Industry's association anticipates production and sales during next ten years of a million furnaces annually



151,172 units, or 40 per cent of total output.

A national increase by 1950 of at least 50 per cent in home heating by oil is forecast by officials of Gulf Oil Corp., Pittsburgh. Public acceptance of oil heat has grown tremendously in the past quarter of a century. While in 1920 only 7500 homes were heated by oil, more than 2½ million American dwellings use oil furnaces today, said Gulf officials who also estimated that 30 per cent of the people planning new homes expect to heat by oil.

#### Air Conditioning Units Increasing

Of the 375,379 furnaces shipped in the first eight months of 1946, approximately 32 per cent were equipped with winter air conditioning units. This compares with 26 per cent in 1940, 32 per cent in 1941, 25 per cent in 1942, 12 per cent in 1943, 9 per cent in 1944, and 21 per cent in 1945. Prior to 1940, records of shipments did not differentiate between gravity and winter air conditioning units. The percentage of units equipped with winter air conditioning units, which incorporate motor-driven blowers, fell during the war period because of the shortage of components and labor. The gravity type furnace, which depends on the heating of air for circulation, has fewer parts than a central heating plant equipped with a winter air conditioning unit and therefore was easier to produce under wartime conditions.

Future trend of shipments of furnaces that include winter air conditioning units will depend on the degree of prosperity prevailing among prospective purchasers, one furnace maker said. Under adverse economic circumstances,

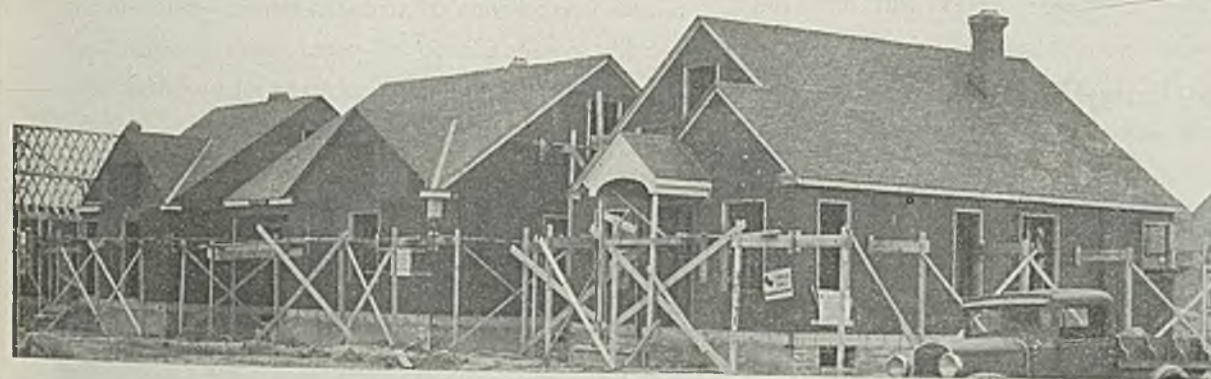
purchasers seek the less complex, less costly gravity type furnace. However, a furnace equipped with at least a blower is said to help save house construction costs by eliminating the need for a basement, which is a necessity if heat is to be circulated by gravity system.

The National Warm Air Heating & Air Conditioning Association estimates that of the approximately 8½ million furnace installations in the United States, more than a million represent winter air conditioning units, including factory designed units and gravity units modernized with blowers and other devices.

Although most furnace manufacturers had no physical plant reconversion problem after the recent war they have been faced with shortages, particularly of sheet and strip steel, fractional horsepower motors, and castings. Typical of the furnace makers' plights is that of one large producer who said: "The scarcity of light gage galvanized sheet metal ranging from 20- to 30-gage, fractional horsepower motors, and other electrical items, including transformers, controls etc., are the principal items, in the order named, that are responsible for our operating at a level far below normal. Our foundries are operating at nearly 100 per cent of their maximum capacity, but we are still far short of supplying the demand."

So serious has been the insufficiency of light gage sheet steel that producers have shipped furnaces minus casings and inner-liners, leaving procurement of these items to field branches. One company said it is holding in abeyance production of automatic oil and gas furnaces because of the lack of sheet steel for

## Shipments Headed for Record



New houses, thousands of which are under construction, provide a huge market for warm air furnaces, the production of which is expected to set a new record this year. Photo, courtesy Cleveland Press

casings and fractional horsepower motors for driving blowers and oil burners.

Indicative of the seriousness of the shortages is the report by one furnace manufacturer that "the shortage of sheet metal has resulted in our sheet metal shop working on a hand-to-mouth basis, and probably at not over 5 to 10 per cent of its normal operating capacity. All of the steel which we do obtain is made into gravity furnace casings and smokepipe materials."

There is considerable room in the furnace industry to increase output if materials can be obtained, for the work-week could be lengthened or additional shifts employed. One furnace maker said: "We are working a 48-hour week, but because of the scarcity of sheet metal our sheet metal shops are very much undermanned. If materials were available, all of our departments would be working a full 48-hour week. Yet we would be unable to fulfill demand."

Although it is believed warm air furnace production in 1946 will total 600,000 units, the National Housing Agency has estimated that 700,000 will be needed. Originally, 75 per cent of the total production had to be offered to veterans. However, this since has been changed so that only the sizes of furnaces suitable for veterans' houses must be set aside to the extent of 75 per cent for ex-servicemen.

Although the current demand for furnaces exceeds production, one furnace maker said he believed the tightness of the situation might ease around the first of 1947 because by that time winter weather will have slowed down construction of houses.

Considerable strides have been made

in improving home heating equipment, and now the emphasis in research is on providing scientifically conditioned air through new devices installed in central heating systems. Prominent in this research is the National Warm Air Heating & Air Conditioning Association which has carried on a continuous warm air research program since 1918 in co-operation with the University of Illinois, Urbana, Ill. In 1924, the association provided the university with a large research residence so that investigations under actual living conditions could be made.

Now, the association is building a new research residence at Urbana and is further expanding its research program.

#### Public Education Program Conducted

To educate the public on the need for complete year-round indoor comfort, the National Warm Air Heating & Air Conditioning Association has organized the Indoor Comfort Educational Bureau, with headquarters in Cleveland. Seven-factor theme of the bureau's program is that for complete indoor comfort, air within a home must be heated or cooled, humidified or dehumidified, clean, circulated, fresh, pure, and of adequate density.

Continuous research has made it possible to reduce the size of furnaces and increase efficiency, with the result less steel and castings are needed for present-day units. An example of this is cited by one of the leading manufacturers of furnaces which said one of its prewar oil-fired furnaces consisted of 589 parts,

required 20½ square feet of floor area, and weighed 1800 pounds, but that its postwar unit, having an identical capacity and rating, consists of but 233 parts, requires only 10 square feet of floor area, and weighs only 730 pounds. Both of these units included blowers, air filters, humidifiers, oil burners, and similar equipment to make the units complete.

Helping reduce the size of furnace necessary to heat a house has been the trend toward small houses and the increased use of insulation.

As an outlet for iron and steel the warm air furnace industry furnishes a substantial market. While exact figures are unavailable it is estimated that on the basis of 1946 record production of furnaces consumption of iron and steel in the field exceeds a quarter of a million tons. It is pointed out that although per unit consumption of metal is declining because of the trend to smaller units, total use is rising rapidly due to the expansion in demand and with this trend promising to continue for several years into the future the indications are a steady growth in this iron and steel market outlet will be experienced.

An opportunity to see many of the achievements of the heating and air conditioning industry will be afforded in Cleveland, Jan. 27 to 31, inclusive, by the International Heating and Ventilating Exposition, in connection with which the National Warm Air Heating & Air Conditioning Association will hold its annual midwinter convention on Jan. 29 and 30.

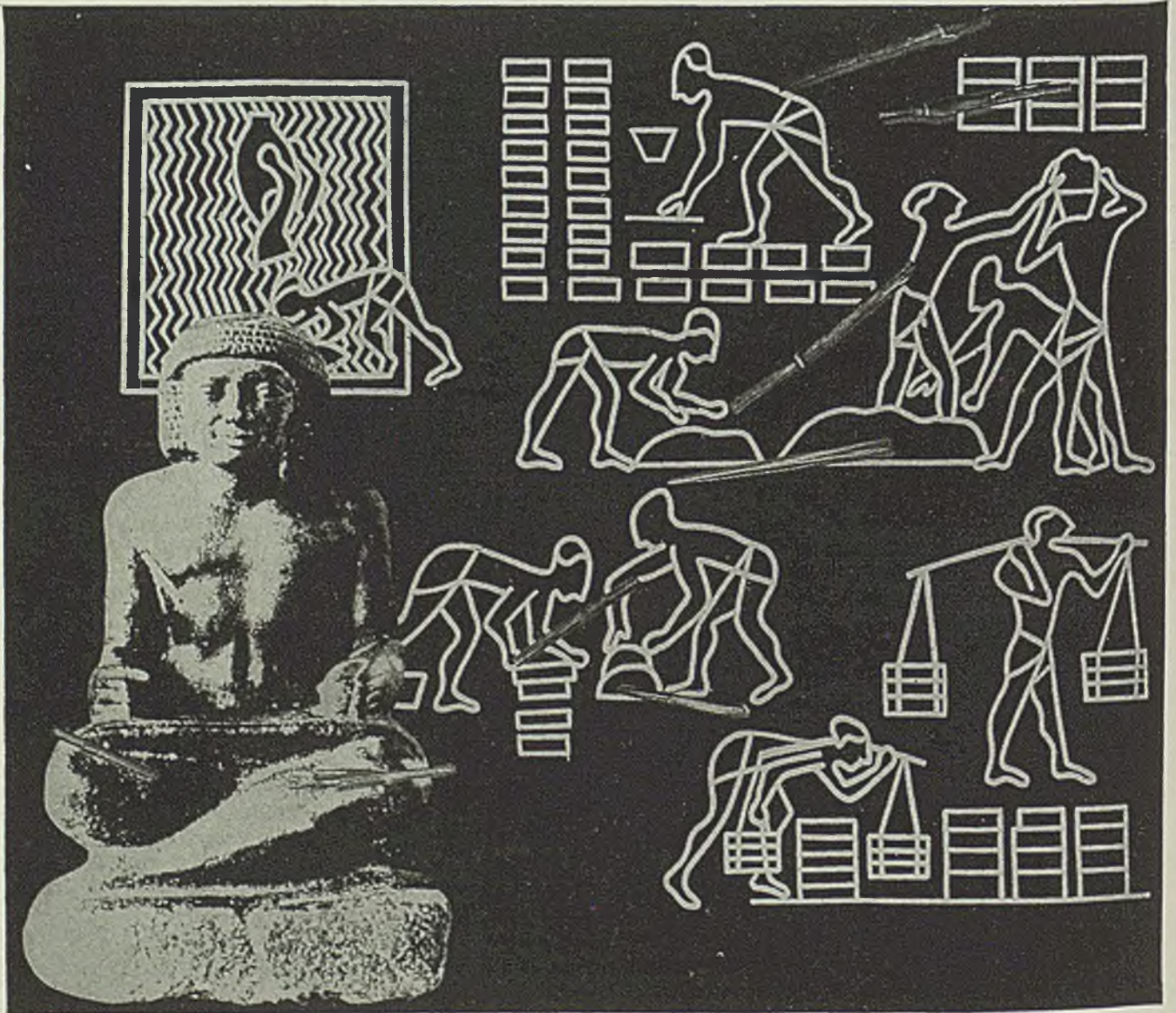
# BRICKS WITHOUT STRAW

Long, long ago a penny-conscious Pharaoh tried to cut his cost corners by decreeing that bricks would be made without straw. He found out—the hard way—that scrimping on materials throws product performance and customer good will into full reverse.

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**Automakers view high labor costs in passenger cars with deep concern. Return to high productivity and lower prices requires corrective action along three lines: Psychological, technical and incentive**

**DETROIT**

DEEP concern being expressed by automobile executives — and by many other durable goods industry leaders as well—over the inordinately high degree of labor cost entering into their product is of course nothing new, and there is small chance that even a Republican landslide this Tuesday will result in any markedly changed viewpoint, because the problem is deeply rooted in basic economics rather than in politics. The damage has already been done, repair may be a long and costly procedure.

As so ably reviewed by F. D. Newbury, a vice president of Westinghouse, in a paper before the American Management Association, the present confusion and concern springs from three basic conditions: 1. The far-reaching extensions of government intervention in the everyday affairs of industry during the war and the continuation of this trend in haphazard fashion since the end of the war; 2. extension of the power of labor unions in the everyday affairs of industry, and the consequent weakening of management's own power to control discipline, to control costs, to increase overall efficiency of operations; 3. management's own failure to resist sufficiently the influence of war extravagance and the temptation to overexpand and overelaborate expense or overhead activities.

Fortunately, as far as automobile manufacturing is concerned, there are signs of at least a start toward correcting these basic ills. As everyone now realizes, government bureaucracy became alarmed at public resentment over many forms of control as elections approached, and moved fast to lift many of them. However, those which have little political impact on the public itself are kept in force, thereby adding to the industrial confusion. The power of labor unions over the nation's economy, so graphically demonstrated since V-J Day, at least has grown no more potent since the strikes early this year, and if anything its demands have tempered somewhat. Management has recognized its wartime extravagance and overoptimistic outlook for peacetime production and is now engaged in a job of pruning and weeding, particularly on the score of nonproductive labor.

One may ask, "Will prices eventually

move back in the direction of their prewar level and, if so, how can manufacturers realize a profit if they are only breaking even now and must continue to be faced with an out-of-balance wage level?" One obvious way is to make adjustments downward in the wage level, but there is no one in the automobile industry who concedes even the remotest possibility of this being done. The only sound answer of course is to restore per

## Automobile Production

Passenger Cars and Trucks—U. S. and Canada

Tabulated by Ward's Automotive Reports

	1946	1941
January . . . . .	121,861	524,037
February . . . . .	83,841	509,332
March . . . . .	140,777	533,878
April . . . . .	248,318	489,856
May . . . . .	247,620	545,321
June . . . . .	214,511*	646,278
July . . . . .	330,764*	468,897
August . . . . .	359,180*	164,793
September . . . . .	349,124*	248,751

Estimates for week ended:

Oct. 12 . . . . .	86,330	79,065
Oct. 19 . . . . .	89,540	85,600
Oct. 26 . . . . .	87,240	91,855
Nov. 2 . . . . .	88,000	92,879

\*Preliminary.

man output or productivity to its prewar level and beyond, in other words to accelerate the long-established trend of year-to-year improvement in productivity, so that it can match or at least come closer than now to the precipitate advance in wages.

Three roads lead in this direction. One is psychological, one is technical, one might be labeled, for the want of a better term, incentive. The psychological factor is already making its effect felt. One large motor company reports overall efficiency has moved up from 80 to about 85 per cent of prewar, principally because of a changed attitude on the part of both hourly rated and salaried employees, who observe steps being taken to co-ordinate personnel, slash advertising and sales budgets, reduce overhead and nonproductive labor, and are be-

ning to think perhaps they had best pitch in and do some real work.

The second or technical factor will take care of itself. As long as the sweat and brains of a thousand-odd suppliers of machinery, equipment, tooling, dies, jigs, fixtures, conveyors, and the other appurtenances of efficient manufacturing continue to be expended, as long as the metallurgists and engineers of materials and parts vendors are earning their keep, along with the vast technical staffs of the automobile manufacturers themselves, there need not be too much worry over technical contributions to improved productivity.

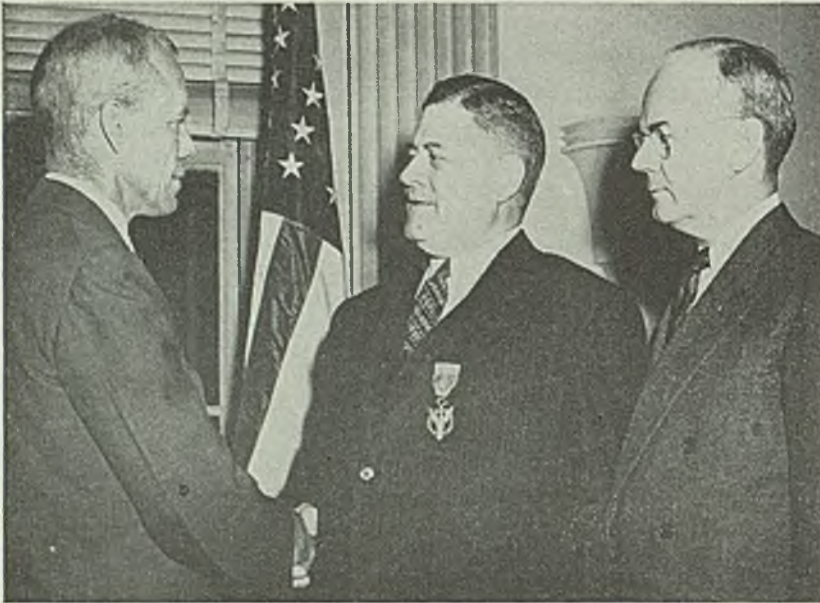
The third factor needs much concentrated attention. More pay for more work has always been an acceptable manufacturing tenet. Whether it is called an incentive system, a profit-sharing plan or a productivity bonus is largely a matter of terminology. Unfortunately, union leaders since 1937 have waged bitter and successful campaigns against such systems, but there are signs they are turning from their animosity toward incentives. One of the most recent is the case of Sealed Power Corp., Muskegon, Mich., piston ring manufacturer, where a 19-week strike against an established piecework plan terminated in capitulation of the UAW-CIO and a retention of the bonus system. Mystery surrounds the reason why the union abandoned the fight which to all intents and purposes started out as the spearhead of a drive to obliterate incentive systems from all UAW contracts. Perhaps the pressure of economic losses suffered by idle workers became a major factor.

### Bundy Plan Cited

In this connection, the cost-savings sharing plan instituted here last April 1 by Bundy Tubing Co., and outlined briefly in STEEL for Oct. 28, p. 45, has some interesting background. Bundy is the leading supplier of small-size tubing to the automotive, refrigeration and gas range industries, not only producing the tubing itself, but fabricating it into hundreds of special shapes required by various users. The fabricating end of the business, since it involves much more hand labor than the production side, which is largely machine controlled, accounts for 75 per cent of the company's hourly rated personnel, although by dollar volume it is only 58 per cent of the total.

Going back to last December when Bundy began to take stock of reasons for diminishing output—and profits—it was found the fabricating department was

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**KELLER HONORED:** Secretary of War Robert P. Patterson, left, congratulates K. T. Keller, president of Chrysler Corp., after the latter had been presented the Medal for Merit for war services. At right is John W. Snyder, Secretary of Treasury

showing an efficiency of only 55 per cent of the standard for 1937 before piecework rates had been supplemented by straight hourly wages. This sharp decline in efficiency was costing the company an appreciable segment of its fabricating business and was jeopardizing its competitive position, to the point where the board of directors of the company decided to abandon the fabricating business entirely, laying off 75 per cent of the hourly workers and 80 per cent of the supervisory force. President Wendell W. Anderson held out only one hope for maintaining operations of the fabricating division and that was the institution of an incentive system worked out jointly by the management and union representatives. A vote of the employees approved this suggestion.

The plan finally submitted to employees and eventually applied to the entire operation, including the production division, was described as a cost-savings sharing plan in deference to adamant union opposition to the term incentive system. Briefly it involved determination of the hourly rated labor allowance of net sales totals each month, finally calculated at 29.78 per cent, then assigning to a bonus fund one-half the difference between this percentage and total hourly wages paid during the month, the other half going to the company. Each employee's share is figured on the basis of the total number of hours he worked during the month, after dividing the employee's share of the gross earned

by the total number of hours all employees worked.

A number of minor corollary features are included, but this is the basic pattern of the plan which has worked with eminent success, employees averaging about 22 cents an hour bonus on top of a base rate which is comparable or perhaps even a bit higher than other industries in the Detroit area. The system has improved efficiency, reduced absenteeism, cut scrap loss, bolstered morale, minimized grievances and apparently sustained profits. It has been received enthusiastically by virtually all the company's 1200 hourly rated employees. One important provision should not be overlooked—the fact the plan pays off identically to all employees who work the same number of hours, regardless of their base rate. This was unquestionably a clinching factor in acceptance of the idea by the UAW-CIO.

Only time, of course, can tell how well the Bundy plan will survive the downs as well as the ups of industrial production. However, it is interesting to note Mr. Newbury of Westinghouse in his previously mentioned address declares: "Some plan is needed that will restore a degree of flexibility to the total wage and salary payroll, and some flexibility must be restored if our American system of private enterprise is to function successfully. One way of securing this desired flexibility is to add to regular weekly or monthly wage and salary payments an additional and separate wage

and salary adjustment based on profits, or preferably, on the ratio of total payroll to total production or billings, or on some other simple relation to volume of billings that will avoid the complications necessarily involved in the determination of operating profit."

### Pig Iron Slightly Easier

Slight easing is reported in the pig iron supply outlook by automotive foundries, although it is still not encouraging enough to cheer about. For a time automotive buyers were moving in tonnages of pig from Mexico, England and even Norway, in addition to long hauls from Utah and elsewhere. Kaiser-Frazer has been shipping tonnages of iron to its foundry suppliers from the 400-ton per day stack it has leased from Struthers Iron & Steel Co. in Ohio, and also plans to supply basic iron to mills which furnish sheet steel to the Willow Run plant.

### Copper, Lead Supply Better

Not so much worry currently is being expressed over copper and lead as was the case a month or two ago, principally because the government has moved to release these metals in better volume to the motor industry. One company, incidentally, at the time of the critical shortage, made application for an import license to acquire copper and lead, but was turned down in Washington for unexplained reasons. At the moment there is fairly general agreement that materials bottlenecks still existing would be swept away with abandonment of government price controls.

### Briggs Installs Enameling Unit

Briggs Mfg. Co. has completed installation of a new \$250,000 porcelain enameling unit in its plumbingware division which will increase output of steel fixtures by 50 per cent. Production during the first six months of this year was up 114 per cent over the same period, and with the new facilities bathtubs will be stepped up to 75 an hour, lavatories to 300 an hour and sinks to 300 an hour. Equipment includes a 132-foot continuous porcelain enameling furnace, new enamel spray booths, a battery of drying ovens and a network of conveyor systems which makes handling completely mechanized.

Expanded from a modest pilot effort in 1933, production of these enameled steel fixtures now is a splendid example of the application of automotive mass production methods, not the least spectacular of which is drawing the 15-inch depth for a bathtub from a sheet of 14-gage steel.

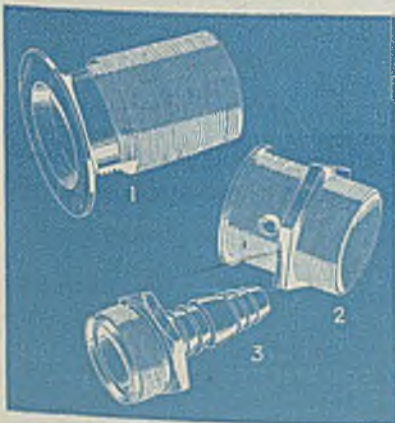
# IS THERE A DIE CASTING IDEA HERE FOR YOU?



## CAST THREADS SHOULD ALWAYS BE CONSIDERED

If threads are required on a die casting, the designer should carefully consider the possibility of effecting economies by *casting* instead of *cutting* them. External threads are easily cast if they are coarse, or over  $\frac{3}{4}$ " pitch diameter, and are located at a die parting. The flash which occurs on such threads can easily be removed in a simple trimming operation. Internal threads are sometimes cast when very steep pitches are called for.

Illustrated below are three *zinc alloy* die castings with cast external threads. #1 is a flanged plumbing drain with a 14-pitch thread,  $1\frac{1}{2}$ " in diameter and  $1\frac{3}{4}$ " long. #2 is an electrical bushing with a 24-pitch thread to accommodate a die cast nut. This thread is  $1\frac{1}{8}$ " in diameter and  $1\frac{3}{8}$ " long. #3 is a hose nipple with a 1" diameter 24-pitch thread which is  $\frac{1}{8}$ " long. Finer threads than these are seldom cast.



## NEW TYPE SPRINGLATCH IS DIE CAST

The new door latch shown below has a *zinc alloy* die cast latch body and striker. This is known as the "one-arm springlatch" since it is designed to permit a door to be unlatched and opened with one hand—a great advantage when you arrive home with an armful of bundles. The manufacturer of this latch adopted die castings for the principal parts because of favorable experience with this method of production for many other items in an extensive line.



The *zinc alloy* die cast latch body is of particular interest since only a few simple operations—trimming, drilling and tapping—are required to prepare this part for assembly, (see photograph next column—top, as-cast—bottom, as-machined). All of the elements for assembling the lock mechanism are obtained in the casting operation, and the as-cast surfaces are readily finished with a good-looking lacquer-enamel coating which has the appearance of dull brass.



This die casting application is covered in greater detail in the current issue of our die casting publication, "The Alloy Pot". If you are not receiving this publication regularly, just drop us a line. Also ask us—or your die casting source—for a copy of "Designing For Die Casting".



Send for  
your copy



# ZINC

FOR DIE CASTING ALLOYS

The New Jersey Zinc Company, 160 Front St., New York 7, N. Y.

The Research was done, the Alloys were developed, and most Die Castings are based on  
**HORSE HEAD SPECIAL** (  $99.99 + \%$  Uniform Quality ) **ZINC**



## Piper Aircraft Oklahoma Plant Being Improved

*Ponca City factory will take over complete production of personal plane. Employment there will be increased*

DEVELOPMENT of its facilities at Ponca City, Okla., is being pushed by Piper Aircraft Corp., Lock Haven, Pa., so that the Oklahoma plant can take over complete production of the Piper Cub J3 personal plane and permit the company's main Lock Haven plant to concentrate on production of the three-passenger Super Cruiser.

Current production at Ponca City exceeds 40 planes a week, with plans for production of 20 planes a day by Jan. 1. Employment now exceeds 300. Plans call for employment of 500 by the beginning of 1947.

Through economies in shipment of parts and materials from Lock Haven to Ponca City the price of a Cub at Ponca City will have to be increased only \$50, whereas planes delivered by air to Oklahoma from Lock Haven were subject to a delivery cost of more than \$100.

A 1500-foot overhead conveyor system is being installed at the Ponca City plant to improve efficiency in moving wings and fuselages through various stages of fabrication.

Production at Ponca City is centered in two large buildings. Among the facilities is a large warehouse. Prefabricated parts, such as wing ribs, welded fuselages, uncovered landing gears and tail surfaces, and spars, arrive at Ponca City by freight car from Lock Haven and are put through seat and floor, cockpit, covering, finishing and final assembly stages in one building. From there these units move by conveyor system through a connecting building. Wings and fuselages are sprayed along the way in separate spray booths. The final assembly building is large enough for more than 60 planes, in two double lines, in various stages of assembly.

### Glenn Martin Co. To Boost Capacity of Plastics Plant

Capacity of Glenn L. Martin Co.'s chemical plant, which is under construction in Painesville, O., will be more than doubled, according to Glenn L. Martin, president. The plant, which will produce Marvinol resin, a vinyl plastic, had been



**NEW STRUCTURAL SHOP OFFICE:** Recent completion of an addition to the structural shop office building of Joseph T. Ryerson & Son Co., Chicago, has provided these new quarters for the estimating and drafting division. All members of the structural department are now located in the enlarged building which adjoins the company's south warehouse at 18th and Rockwell streets

planned with a capacity of 11 million pounds annually; however, on the basis of present business outlook, increase of this capacity was thought advisable with the result that the facility will be constructed with a capacity of 25 million pounds annually. Cost of construction will be increased from \$1,500,000 to \$3,000,000.

The plant is expected to be in production next April, with full production expected to be reached by early 1948.

### Prefabricated Metal Homes Builders Seek RFC Loans

Wilson Wyatt, housing expeditor, is seeking approval of \$54 million of Reconstruction Finance Corp. loans to spur the veterans' prefabricated housing program. If the loans for 11 concerns seeking federal aid materialize, chances are thought good for meeting the 1947 goal of 600,000 factory-built homes.

The largest loan would involve \$32 million to Lustron Corp., Chicago, subsidiary of Chicago Vitreous Enamel Product Co. Although no official announcement has been made of Lustron's plans, it is said that the company's target would be production of 400 homes a day. These homes would be made largely of vitreous enamel materials, produced in large units and assembled on the site.

Another builder who is expected to share in the program is Andrew J. Higgins, with a loan of about \$11 million. The Higgins home would feature porcelain enamel, both inside and out.

Final determination of price has not been made for these proposed houses, but the aim of most producers is to

turn out fully equipped units for \$7500 or less, exclusive of land.

Housing Expediter Wilson Wyatt on Oct. 28 issued a formal directive to the War Assets Administration canceling the latter's lease of the former Dodge-Chicago aircraft engine plant to the Tucker Corp., and allocating it to the Lustron Corp., which, according to housing officials, is prepared to meet the terms of the Tucker Corp.'s lease. Rent of the plant to the Tucker company was to be \$500,000 a year for the first two years and graduated upward after that. Tucker was to have the right to purchase the 80-acre layout for \$30,000,000, and the plant was to be used for manufacture of a rear-engine automobile.

Lustron states its steel house will have five or six rooms, completely equipped with radiant heat, refrigerator, range, bathroom, cupboards and closets, and will sell for about \$7000.

### Blaw-Knox Bid for Surplus Armor Facility Approved

Cleveland regional office of War Assets Administration has approved a \$375,000 bid of Blaw-Knox Co., Pittsburgh, for a portion of the government-owned facilities and production equipment, valued at over \$1. million, located at the company's subsidiary Union Steel Castings Division plant. The bid, which is subject to approval by WAA offices in Chicago and Washington, covers land, buildings, and machinery which were used during the war to produce heavy tank armor. Blaw-Knox has been operating the facilities since the end of the war on a lease with option to buy.

## BRIEFS . . . .

*Paragraph mentions of developments of interest and significance within the metalworking industry*

Electric Storage Battery Co., Philadelphia, has purchased a former war plant in Chicago from War Assets Administration for \$1 million. The facility contains 183,000 square feet of floor space and will be used for battery manufacture.

Luria Brothers & Co. Inc., Philadelphia, has established a branch office in Birmingham. Herbert B. Luria III is in charge of the new office.

Pennsylvania Engineering Works, New Castle, Pa., is holding open house for engineers and steel mill executives showing its facilities for fabrication of blast furnaces and steel mill equipment. Also on display is a completely assembled 10-ton new type pear-shaped Brassert bessemer converter.

Ekeo Products Co., Chicago, and affiliated companies have acquired a factory at Byesville, O., from War Assets Administration for \$385,600. The plant, which was built two years ago and had never been used, contains approximately 80,000 square feet of floor space.

Drake Steel Supply Co., Los Angeles, has completed the expansion of its Los Angeles plant with the addition of 33,000 square feet to warehouse facilities, doubled office space and a new wire products division.

Perfection Stove Co., Cleveland, is planning construction of a factory addition to its Ivanhoe road plant in Cleveland. The work, to cost an estimated \$1,925,000, will be done by George A. Rutherford Co., Cleveland.

Pittsburgh Plate Glass Co., Pittsburgh, has acquired Morck Brush Mfg. Co., San Francisco, and will operate it as Morck Brush Division.

Whelco Instruments Co., Chicago, has opened a new district sales and service office at 107 S. Capitol Ave., Indianapolis, which will serve most of Indiana, western Ohio and Kentucky.

Iron Fireman Mfg. Co., Cleveland, has purchased L. R. Teeple Co., Portland, Oreg., which it has been operating for more than a year. The Teeple plant will be known as the Heating Control Division.

Gulf Oil Corp., Pittsburgh, has opened a fuel oil laboratory at Harmarville, Pa.

which will be devoted to developing greater efficiency in home oil heating.

Redmond Co. Inc., Owosso, Mich., has offered to manufacturers of products powered by the company's Micromotors the styling services of Bruce Kamp Associates, Philadelphia and New York. The service includes product design, styling, colors, materials and packaging.

Atlas Mineral Products Co., Mertztown, Pa., has formed an affiliate organization, Atlas Mineral Products Co. of Texas, located at Houston, Tex. In addition to manufacturing sulphur cements and other products, the new company will handle the company's sales in western Tennessee, Mississippi and Louisiana and in the territory west of the Mississippi river with the exception of Minnesota, North Dakota and eastern Missouri.

Rome Cable Corp., Rome, N. Y., has plans to construct a manufacturing building estimated to cost \$600,000. James Stewart & Co., New York, has been awarded the contract.

Apex Electrical Mfg. Co., Cleveland, and Vactric Ltd., London, England, have signed a long-term co-operative agreement making available to the British company Apex's engineering services, production techniques, designs, and patents to produce washing machines.

Allis-Chalmers Mfg. Co., Milwaukee, has announced installation of what is said to be the first electronic frequency converting equipment in the United States for the production melting of alloy steels at Michiana Products Co., Michigan City, Ind.

Western Electric Co. Inc., New York, has begun production of switchboard cables and magnet wire at its recently leased plant in Buffalo.

Lodge & Shipley Machine Tool Co., Cincinnati, has acquired all rights for manufacture and sale of Duplimatic, a contour reproducing device for use on metals, from Detroit Universal Duplicator Co., Detroit. Equipment for making the device will be moved to Lodge & Shipley's Machine Tool Division in Cincinnati.

Bates Expanded Steel Corp., East

Chicago, Ind., has purchased 16 acres of land in Torrance, Calif., which will be used as a site for the company's expanding operations.

Koppers Co. Inc., Pittsburgh, has developed a precipitator which will remove either solid or liquid particles from plant discharge gases. The equipment will be built at the company's Bartlett-Hayward plant, Baltimore.

American Rolling Mill Co., Middletown, O., has begun a \$10 million expansion program at its Butler, Pa., plant. The program includes building a new electric melting furnace, several electrical annealing furnaces, changes in the strip rolling mill and additional storage space. When the facilities are completed, it is expected that annual capacity at Butler will be boosted from 591,000 tons to 750,000 tons.

Overly Mfg. Co., Greensburg, Pa., has acquired McAleenan Bros. Co., Pittsburgh, manufacturer of boilers, tanks, stacks and heavy plate work.

Metal & Thermit Corp., New York, has opened a sales office in the Land Title Bldg., Philadelphia, to handle sales of arc-welding electrodes.

Davey Compressor Co., Kent, O., has appointed Contractors Machinery Co. Inc., Kansas City, Mo., as a distributor.

Kramer & Kramer, Los Angeles, has recently installed new equipment and additional facilities for handling all type special studs, bolts and nuts, special headed and threaded parts, and screw machine products up to 3¼ in. in diameter, single and multiple spindle.

Weston Electrical Instrument Corp., Newark, N. J., has begun construction of an engineering building at Newark, containing 79,000 square feet. Walter Kidde Constructors Inc., New York, is the builder.

Logan Engineering Co., Chicago, has appointed Patterson Sales Co., El Paso, Tex., as distributor for Aridifier, an air cleaning device, in Arizona, New Mexico, Mexico and Central America.

Walls Chemicals Division, Liquid Carbonic Corp., Chicago, has moved its manufacturing operations to a new plant at 1454 W. Randolph St., but sales and administrative personnel will remain at 3100 S. Kedzie Ave., Chicago.

Carboloy Co. Inc., Detroit, has appointed Raub Supply Co., Lancaster, Pa., as a distributor for its products.

# Coast Steel Shortage Is Still Acute

*Supply scarcities begin to ease in some materials but steel situation is unrelieved. Components lack holds up production*

HERE and there along the West Coast a few faint signs are appearing that material shortages, which have plagued nearly every industry, may be starting to crack.

For example, there is an increasing supply of lumber. The increase is small, but it may be a forerunner of more ample building materials in the near future. Although finished lumber, such as flooring and that used for interior trim, still is as scarce as ever, there has been an increase in the supply of framing lumber, including rough two by fours, two by sixes, etc., used for supporting flooring, joists, studding and rafters.

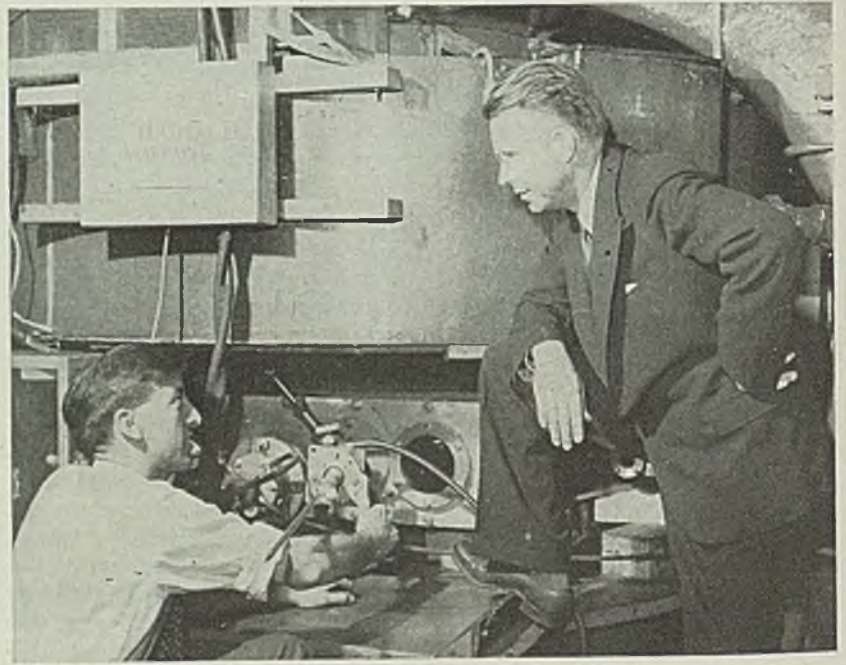
Many manufacturers believe removal of price controls on almost all items will begin to be felt shortly in the form of larger supplies of components. However, fabricators of metal items still remain pessimistic over chances of getting an increased supply of steel any time soon. Steel probably is the most critical of all the shortages now affecting West Coast industry.

Once availability of metal items and other components becomes easier, a flood of finished products may reach the consuming market. The reason is that many manufacturers or fabricators are building up inventories of semifinished items.

For example, one farm equipment firm has piled up a half million dollar inventory of equipment, all completed except for the motive power. As soon as it can get a supply of electric motors and gas engines, the machines can be completed in short order and placed on the market.

Frequently even a shortage of the smallest item can hold up shipments of finished products. An illustration is that of a company making a heating equipment device selling for \$25. However, the gadget could not be completed because of lack of one small part costing 2 cents each.

Another firm, which is going ahead



**ATOM SMASHER TO MOVE:** University of California will move this 37-inch cyclotron from the Berkeley to the Los Angeles campus, where it will be housed in a special building and used by the UCLA physics department in a series of experiments in nuclear physics and chemistry. Shown preparing the atom smasher for moving are Clarence A. Harris, left, electronic technician, and Prof. Ernest O. Lawrence. NEA photo

on production of trucking equipment, is building up a large inventory of semifinished products because it cannot get batteries, brakes, mufflers to finish the trucks.

One factor which has complicated and distorted these component shortages is the practice of many firms in over-buying as a defense against shortages.

For instance, one manufacturer is reported to have obtained a year's supply of bolts, when normally he would carry only a three-months' inventory of bolts. Because of that type of hoarding, other users of bolts have been forced to cur-

tail operations or to put semifinished products into inventory because they lack bolts.

Despite shortages of materials, and sometimes scarcity of skilled labor, most manufacturers are continuing to make profitable production showings for 1946. One major reason is that demand still is far in excess of supply, and nearly every firm is carrying on its books a large backlog of unfilled orders.

With removal of most OPA controls, the upward profit trends are expected to be accelerated. The result for many firms, therefore, may very well be the best in their history.

## Employment Rising in Southern California With Job Offerings Continuing to Mount

### LOS ANGELES

EMPLOYMENT in southern California continues to show substantial gains, with total job offerings and acceptances moving upward without interruption for a full year. Since last April the number of workers in factories of the area has steadily risen.

These statements lead off a report on business activity in southern California announced last week by the Security-First National Bank of Los Angeles.

The total of persons filing unemployment claims in southern California dropped to 133,400 in the week ending Sept. 26 from the peak of 217,500 last February.

Referring to bank debits as an index of commercial activity, the report discloses that these are now more than three times the prewar average in Los Angeles, while in other parts of the area debits are roughly four times the prewar level.

Building permits totaled more than \$50

million in the 14 southern counties of the state during September. Residential building is being begun in undiminished volume. In September, permits for 5400 family units were issued.

Comparatively, the dollar volume of all building in the metropolitan area in the last six months is larger than for any other city in the nation. Totals for the four cities most active in building during that period were given as follows: Los Angeles \$132,968,000, Chicago \$71,012,000, Detroit \$69,172,000, and New York \$61,158,000.

Utility turn-on reports indicate that 3400 homes were completed in August. Preliminary data point to a larger total for September. Homes finished in the two month period will accommodate about 22,000 persons. A survey made last July indicates that in Los Angeles county there are about 50,000 married veterans who are doubled up with other families or are living in trailers or other makeshift habitations.

Meanwhile the Los Angeles CPA office disclosed that during July, August and September commercial building projects of 2387 applicants totaling \$74,797,982 have been halted through nonissuance of construction approvals.

## Consolidated Vultee May Build Aluminum Houses

Volume production of prefabricated homes of aluminum and plastics for temperate climates is being given serious consideration by Consolidated Vultee Aircraft Corp., San Diego, Calif., according to Harry Woodhead, president.

"Our preliminary studies indicate large-scale production of homes which the average family can afford is practical, provided problems of material and equipment supply can be overcome," said Mr. Woodhead. "We do not expect any reluctance on the part of communities to modernize local building codes to conform to new building techniques."

For a price to the home buyer of \$7000 to \$8000, including the lot, a two-bedroom home equipped with a refrigerator, range, hot water heater, complete bathroom and kitchen fixtures, and space heating equipment is expected to be made possible by the new building techniques.

Building materials used in the homes will be mostly aluminum, plastics and new type insulating products.

A full-sized model of the new home is now being built by Convair's Vultee Field Division, Downey, Calif., on a schedule which calls for completion in November.

# Aluminum Fabricating Plant Is Planned by Kaiser Near Portland

*To establish works if satisfactory lease of Swan Island shipyard can be negotiated with War Assets Administration. Company also bids for Olin aluminum plant at Tacoma as does Reynolds Metals Co.*

## SEATTLE

IF SATISFACTORY lease can be obtained from the WAA, the Kaiser Co. Inc. plans to establish an aluminum fabrication plant, employing 3000 to 5000 at the war-built Swan Island shipyard, near Portland. Abandonment of the Richmond, Calif., yard No. 3 by Kaiser means that the company is turning to the Portland area to carry out projected plans.

"It is a definite possibility," Edgar F. Kaiser, wartime manager of all the company's operations in the Portland-Vancouver area, is quoted as saying, "that we might bring an aluminum bus body plant to Swan Island. It is a fact that we will bring some sort of aluminum fabricating plant there if a satisfactory lease can be worked out with the WAA by Dec. 1. The proximity of Swan Island to our Trentwood rolling mill in Spokane makes the Portland location a natural for any aluminum fabricating effort."

Kaiser interests, through the Permanente Metals Corp., of Oakland, are one of four bidders for the Olin aluminum plant at Tacoma, the offers having been forwarded to Washington. Other bidders are: Reynolds Metals Co., Richmond, Va.; Eastern Metals Products Co., Tuckahoe, N. Y., and Pend Oreille Mines & Metals Co., Spokane. According to Sen. Hugh Mitchell, Washington state, Kaiser's bid for outright purchase at about \$2½ million for the \$6 million plant, 20 per cent down, has the best chance of acceptance.

## Surplus Shipyard Offered

War Assets Administration has offered for sale or lease the yard at Portland, formerly occupied by the Commercial Iron Works, used for construction, repair and conversion of naval ships during the war.

For the Army stockpile at Ordnance, Oreg., 28,000 tons of manganese ore is being shipped through the port of Port Angeles, Wash. This material was mined near Lake Crescent, Wash., by the Sunshine Mining Co. and is owned by RFC.

Advice to keep their steam plants "hot" was given to private power company operators by officials of the Bonneville Power Administration at a meeting in Portland last week. Sol Schultz, Bonneville chief engineer, warned that the

combined capacities of private hydroelectric companies and Bonneville and Grand Coulee may not be equal to the expected peak power demand in December. The Bonneville administrator told private utilities that the public plants would not be overloaded "just to save fuel costs for private steam plants. We'll take care of the public power agencies first, our aluminum customers second and what's left will go to private power plants," he added.

Officials of the Puget Sound Power & Light Co., Seattle, were surprised at this statement, declaring their steam plants are always ready for any emergency. Other private utility operators stated they anticipated no acute power deficit even at the peak season, expressing faith in their steam plants to handle heavier peak loads than those expected.

## New Cement Plant Ready for Operation in Seattle Area

The Permanente Cement Co., operator of the world's largest cement plant at Permanente, Calif., last week announced its new half-million dollar plant in Seattle is ready for operation.

The Seattle division has a storage capacity of 80,000 barrels and will provide additional cement for use in western Washington, Canada and Alaska. The plant will be under the direction of Henry J. Kaiser and brings to approximately 5600 the number of Kaiser employees in the state of Washington.

Situated on 11 acres of Seattle waterfront property which was purchased by Permanente in 1944, the plant is within easy access of main arterials and close to the industrial activity of South Seattle.

Costing more than \$500,000, facilities include a dolphin pier, silos, storage facilities, a sacking plant, railroad spurs, truck loading accommodations and an office building.

The new division will be under the direction of E. H. Kendall, with offices at the Seattle location. Kendall joined Permanente Cement Co. in 1943 and has been associated with the cement industry since 1933, when he was employed by Pacific Coast Aggregates Co. during construction of the Golden Gate bridge.

# Men of Industry



SAM A. HIGGINBOTTOM

Sam A. Higginbottom has been appointed vice president, Pratt Industries Inc., Frankfort, N. Y. He will continue as sales manager. Mr. Higginbottom joined Pratt in 1944, following 2 years as a district manager for Smaller War Plants Corp.

H. B. Higgins, president, Pittsburgh Plate Glass Co., Pittsburgh, has been elected a director of Crucible Steel Co. of America, as announced by William P. Snyder Jr., chairman of Crucible Steel Co. of America, New York.

E. B. Andrews has been appointed sales manager, O. K. Tool Company Division, Aerodynamic Research Corp., Shelton, Conn. During the war, Mr. Andrews was in Washington on special assignment with the Ordnance Department.

H. P. Munger has been appointed superintendent, tin finishing department, Indiana Harbor, Ind., works, Youngstown Sheet & Tube Co., Youngstown. He was special metallurgist at the Youngstown plants of the company. Glenn L. Markle has been appointed superintendent of the cold strip mills at the firm's Indiana Harbor works. He was with the Irvin works, Dravosburg, Pa., Carnegie-Illinois Steel Corp., Pittsburgh. Harry T. Silverman has been appointed assistant superintendent of shops of the Youngstown company's Indiana Harbor works. He has been with the firm eight years, and had recently been in the mechanical department of the Indiana Harbor works.

James E. Stevenson has been appointed manager of V-belt sales, United States Rubber Co., New York. During the last



ALVIN F. GROLL

7 years, he had been New York district sales manager, L. H. Gilmer Co., Philadelphia, a division of United States Rubber Co. He joined the Gilmer organization in 1934.

Alvin F. Groll has been placed in charge of sales for mechanical and hydraulic presses and can and container making machinery in the Cleveland area for E. W. Bliss & Co., Detroit. He will have headquarters in Cleveland. Mr. Groll has been with the Bliss company for 12 years.

Dause L. Bibby has been promoted to manager of manufacturing, engineering and research, Poughkeepsie, N. Y., plant, International Business Machines Corp., New York. Mr. Bibby joined IBM in 1934, and became executive assistant of the Endicott, N. Y., plant in 1941. He was appointed resident manager in charge of the company's war manufacturing program at Poughkeepsie in 1943. In 1944 he joined the Navy, and recently returned to IBM as executive assistant at Endicott.

S. J. Jazwinski has been appointed chief metallurgist, Barium Steel Corp., New York. He will devote his time to customer relations, technological research and improvement and expansion of production facilities. Mr. Jazwinski was chief metallurgist, K & L Steelfounders & Engineers, England. He had once been melting shop superintendent, D. Brown & Son Ltd., England.

Thomas A. Murphy has been named general manager of the Phoenix, Ariz., extrusion plant recently leased from the War Assets Administration by Reynolds Metals Co., Richmond, Va. Mr. Murphy



BRUCE BEVELHEIMER

joined Reynolds a year ago as aviation industry manager, and since May had been serving as manager of the firm's Western Aluminum Sales Division, with headquarters in Los Angeles. Prior to service with the Army, he had been with Berry Brothers Inc., Detroit, and United Aircraft Corp., East Hartford, Conn.

Bruce Bevelheimer has been named assistant to the vice president, Furnace Engineers Inc., Pittsburgh. He had been with Algoma Steel Corp. Ltd., Sault Ste. Marie, Ont., Canada, since 1944. Mr. Bevelheimer has been associated with the steel industry since 1924 when he joined the technical staff of Bethlehem Steel Co., Bethlehem, Pa., at its Sparrows Point, Md., plant.

Ardee H. Freeman, district sales engineer for the Milwaukee territory, American Foundry Equipment Co., Mishawaka, Ind., has returned to the firm's Mishawaka office to become special project engineer. Mr. Freeman joined American Foundry Equipment Co. in 1918. For the last 9 years he was engaged in sales engineering work for the company. James H. Thomson has been appointed district sales engineer for the Milwaukee territory, replacing Mr. Freeman. He had been doing sales engineering work in the Mishawaka office. During the war, he served in the Navy. Edwin P. Clarke has been assigned to the company's Houston, Tex., office, where he succeeds Joseph F. Underway who has been transferred to St. Louis.

James R. Steen has been appointed director of quality control for the Lamp, Fixture, Wire Products, Tungsten & Chemicals, Radio Tube and Electronic Divisions, Sylvania Electric Products Inc., Ipswich, Mass. He joined the company

WEATHER  
 Clear with dim-  
 inishing clouds.

CLEVELAND, NOVEMBER, 1946

76TH YEAR OF TINNERMAN PROGRESS

# BUYERS GET HOT TIP

MASS PRODUCTION OF NEW SERIES SPEED NUTS RESPONSIBLE FOR LOWEST PRICES IN HISTORY

Buyers Determine Savings by Checking Present Purchases of Threaded Nuts and Lock Washers

NEW SPEED NUTS HAVE RUST-RESISTING FINISH

Shrewd, alert, cost-conscious John Buyer, speaking today for American Industry, admitted wide affect of latest Tinnerman Announced C7000 Series Speed Nuts, costing less than threaded nuts plus lock washers, will save hundreds of thousands of dollars, as well as give impetus to better production products.

Speed Nuts may be used on production assembly lines of all types. They provide the spring tension necessary for tight assembly. They are sufficiently resistant to rust damage due to expansion and contraction of the metal.

The wide bearing surface of the Speed Nut spreads the fastening load over a much greater area than does an ordinary threaded nut. Therefore, the use of separate spacer washers is unnecessary. Here again there is a saving in cost per assembly time.

Speed Nuts are self-locking, for their unique spring action provides a positive lock that prevents vibration loosening. Thus, the use of separate lock washers is completely eliminated. You save the cost of the washers and the time necessary to handle and install them.

SPEED NUTS ELIMINATE LOCK WASHERS

With the use of C7000 Speed Nuts, the lock washer is unnecessary and obsolete. The same of the lock washer supply a spring tension to the threaded nut and the part. With the spring incorporated in the Speed Nut, one part is necessary. This part is easy to use and easy to handle. In fact, the Speed Nut of all sizes is fully assembled and ready to use with a lock and a tight grip. The Speed Nut is a one-piece unit. There is no separate lock washer. The Speed Nut is a one-piece unit. There is no separate lock washer. The Speed Nut is a one-piece unit. There is no separate lock washer.



FASTEST THING

Shrewd, alert, cost-conscious John Buyer, speaking today for American Industry, admitted wide affect of latest Tinnerman Announced C7000 Series Speed Nuts, costing less than threaded nuts plus lock washers, will save hundreds of thousands of dollars, as well as give impetus to better production products. From Cleveland comes word that large stocks are on hand for immediate delivery. Prices and samples of the new Speed Nuts can be had for the asking.

Many of the problems of the old-fashioned nut and lock washer combination are eliminated by the Speed Nut. The Speed Nut is a one-piece unit. There is no separate lock washer. The Speed Nut is a one-piece unit. There is no separate lock washer. The Speed Nut is a one-piece unit. There is no separate lock washer.

Speed Nuts are self-locking, for their unique spring action provides a positive lock that prevents vibration loosening. Thus, the use of separate lock washers is completely eliminated. You save the cost of the washers and the time necessary to handle and install them.

Greater Strength is Result of 20 Years of Engineering Experience. The C7000 Series of the Tinnerman. The experience of the Tinnerman. The experience of the Tinnerman. The experience of the Tinnerman.

Speed Nuts

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in 1931, and had been manager of the quality control engineering department, Radio Tube Division, since 1944. **Milton E. Lauer** has been appointed to the newly created post of product manager, Radio Tube Division, for the Sylvania company. He will report directly to **H. Ward Zimmer**, vice president. Mr. Lauer joined the company in 1933. From Sept., 1944, until June, 1945, he served as chief, production scheduling and distribution unit, electron tube section, radio and radar branch, War Production Board, Washington.

**Homer L. Hosking** has been elected president of the newly formed Republic Boiler Corp., New York. **Willard Scott** has been named secretary of the firm. Mr. Hosking has been vice president, United States Radiator Corp., Detroit, and its Pacific Steel Boiler Division.

**Edwin P. Vanderwicken** has been appointed secretary and treasurer, York Corp., York, Pa. He had been assistant to the president, Signode Steel Strapping Co., Chicago, and treasurer of Signode International Ltd. and its subsidiaries. Mr. Vanderwicken joined Signode Steel Strapping Co. in 1939.

**John C. McFarland** has been appointed manager, Body Division, Willow Run, Mich., Kaiser-Frazer Corp., and Graham-Paige Motors. During the war, Mr. McFarland was general superintendent of the Kaiser No. 2 shipyard, Richmond, Calif.

**Eugene Somoff** has been appointed to the newly created post of technical service engineer, American Standards Association, New York. He will collect and supply technical information concerning American standards and those of other countries, and will conduct world wide surveys of standards available in any particular field for use by committees of the

ASA, company members, and the association's own engineering staff. During the war, Mr. Somoff served as a Russian translator for the United States Army.

**Russell P. Proffitt**, since 1933 Chicago divisional manager, Timken Roller Bearing Co., Canton, O., has been transferred to the company's Washington office as district manager. Mr. Proffitt joined the company in 1923, in the Huntington, W. Va., office. Prior to that, he was with the Huntington branch of American Car & Foundry Co., New York.

**D. B. Gooch**, Birmingham, has been appointed sales representative in North and South Carolina and parts of Alabama and Georgia, Pittsburgh Electrodyer Corp., Pittsburgh. He had been with J. P. Devine Mfg. Co. Inc., Mt. Vernon, Ill., and Blaw-Knox Co., Pittsburgh.

**Bert Persing Newton**, vice president, Gulf Oil Corp., Pittsburgh, has been awarded the Order of the Lion of Finland, with the rank of commander, in recognition of services rendered to that country.

**L. G. Tingwall Sr.** has been appointed engineering consultant, Intercontinental Engineers Inc., Chicago. For the last 12 years, he had been with Revere Copper & Brass Inc., New York. Recently he was a member of the general office engineering staff of that firm. Since the end of the war, he supervised the engineering and equipping of Revere's new brass mill at Sao Paulo, Brazil.

**Barth E. Shea**, manager of naval stores sales, Southern States Iron Roofing Co., Savannah, Ga., has been elected to the board of directors of the company. Mr. Shea has been with the company for almost 25 years. During this time he served as manager of the firm's Birmingham factory, manager of the Savan-

nah factory, and for a period of ten years was in Hattiesburg, Miss., opening and developing a new drum factory and distributing branch to serve the company's Gulf States naval stores trade. Since 1944, Mr. Shea has been in the Savannah general office, in charge of the company's naval stores operations.

**Norman B. Newcomb** has been appointed construction superintendent, National Gypsum Co., New York. He has had construction experience with the Port of New York Authority, Anaconda Copper Mining Co., New York, Phelps Dodge Corp., New York, and Kellogg Corp.

**Ward R. Schafer** has been named general sales manager, Ideal Industries Inc., Sycamore, Ill. Mr. Schafer resigned his post as vice president in charge of sales, Edison General Electric Appliance Co., Chicago, effective Nov. 1.

**Philip Roden** has been named general manager, Michael Yundt Co., Waukesha, Wis., succeeding **Joseph F. Oliver**, recently resigned. Mr. Roden assumed his new duties Nov. 1. The company manufactures brewing machinery, etc.

**Don T. Allen** has been appointed assistant general manager, Stran-Steel Division, Great Lakes Steel Corp., Detroit. He had been executive administrator, Chicago district, A. O. Smith Corp., Milwaukee. He was in charge of all sales and operations in 10 north central states for that firm. From June, 1942, until October, 1943, Mr. Allen was Wisconsin state OPA director.

**C. B. Cooper** has been placed in charge of the new Philadelphia office for handling the sale of arc-welding electrodes. Metal & Thermit Corp., New York. He had been on the company's New York sales staff. **J. G. Straub** will be assistant to Mr. Cooper.

**Homer A. Holt** has been appointed general counsel, Union Carbide & Carbon Corp., New York. Mr. Holt has been a member of the board of directors of the company since April, 1944. He will assume his new duties Jan. 1. He is a former governor and attorney general of West Virginia.

**H. M. Griffith** has been promoted to general superintendent, Hamilton, Ont., works, Steel Co. of Canada Ltd., Hamilton. He was assistant works manager. **G. P. McAleer** has been appointed assistant general superintendent. He had been at the Gary, Ind., plant, Carnegie-



JOHN C. McFARLAND



L. G. TINGWALL SR.

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**Softening 18-8?** How long should 10-gage E-S 18-8 (Type 302) sheet be held at heat to soften it between deep-draws? Can it be heated in a salt bath?

**Oil-Quenching?** Will oil-quenching make E-S 18-12 Mo stainless (Type 316) plate pick up carbon and lose corrosion-resistance?

**25-20 Hardenable?** To what Brinell can we harden E-S 25-20 chrome-nickel steel (Type 310) blades by heat-treatment? Can they be case-hardened?

**Stress-Relieving?** What heat-treatment do you recommend for stress-relieving titanium-stabilized stainless (Type 321) sheet after welding?

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**Minimizing Scale?** How can we reduce scale formation when annealing light E-S 17-7 stainless (Type 301) sheet? We now hold it at 2,000° F. for 15 minutes

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Illinois Steel Corp., Pittsburgh, subsidiary of United States Steel Corp.

R. A. Schroeder has been appointed head of the planning section, Operations Division, Willys-Overland Motors Inc., Toledo, O. He had been assistant director of the planning staff for operations of General Motors Overseas Corp., subsidiary of General Motors Corp., Detroit.

Walter A. Beckdahl has been appointed to the staff of Battelle Memorial Institute, Columbus, O., and assigned to its Division of Production Research. He had been with the Jamestown, N. Y., plant, Sylvania Electric Products Inc., where he specialized in machine design.

Robert C. Friedly has been appointed construction specialist, Nelson Sales Corp., Lorain, O. His initial assignment will be to establish complete application specifications for Nelson stud welding in construction. Mr. Friedly joined the Nelson organization shortly after his recent discharge from the Army.

Edward Glen Baer recently was appointed treasurer, Will-Burt Co., Orrville, O. He also holds the post of vice president. Mr. Baer joined the company in 1915, and in 1928 when the firm first started making automatic coal stokers, was named superintendent of that division.

Robert C. Troup has been elected president, Keystone Mfg. Co., Buffalo, succeeding Edward J. Ricklin, retired. Edward J. Kreuger, vice president, was also named general manager. Mr. Troup is also president of Troup Engineering Co., Buffalo.

Arthur L. Strickland has been elected treasurer, Kellogg Petroleum Products Inc., Buffalo. He joined the company last July. Prior to that, he had been in the comptroller general's office, U. S. Accounting Department.

Frank Tuschman, Steel Baling Co., East St. Louis, Ill., has been elected president, St. Louis chapter, Institute of Scrap Iron & Steel, succeeding Abe P. Ashner who has retired after two years of service. Sam Lefton, B. Lefton & Sons Iron & Metal Co., St. Louis, has been elected first vice president, and Charles Forcheimer, Jack R. Forcheimer & Son, St. Louis, has been elected second vice president. Sol Mack, Frank Mack Co., Edwardsville, Ill., has been elected third vice president of the chapter. Sidney Grossman, Grossman Iron & Metal Co.,

St. Louis, has been re-elected secretary-treasurer of the St. Louis chapter of the institute, and Abe P. Ashner has been made chairman of the executive committee.

Marshall A. Shapiro, California Metals Co., Oakland, Calif., has been re-elected president of the Northern California chapter, Institute of Scrap Iron & Steel. Other officers who will continue to serve in the same capacity are: Louis Rothenberg, American Iron & Metal Co., Emeryville, Calif., vice president; and Harold T. Levin, Salco Iron & Metal Co., San Francisco, secretary-treasurer.

F. Ellis Johnson has been appointed to take charge of educational activities at the Hanford Engineer works, Richland, Wash., recently taken over by General Electric Co., Schenectady, N. Y., and assigned to its chemical department, headquartered in Pittsfield, Mass. Mr. Johnson served as dean of the College of Engineering, University of Missouri, from 1935 to 1938, and for eight years thereafter served in a similar capacity at the University of Wisconsin.

Reynolds Metals Co., Louisville, has announced the resignation of the following seven officials in the sales department of its Aluminum Sheet Metal Division: Albert H. Charlton, sales manager; Donald G. Dunn, assistant sales manager; James Van Kennen, assistant sales manager; Jack Roche and J. E. Irwin, staff assistants; Paul McCarriston, district manager, Philadelphia; and Robert E. Sidebottom, member of the Philadelphia sales staff.

Dean L. Sellers, assistant sales manager in charge of passenger cars, Ford Motor Co., Dearborn, Mich., has been named assistant general sales manager in charge of the eastern half of the nation for the company. L. W. Smead has been promoted from national director of business management to assistant general sales manager of the western half of the country for Ford.

Theodore K. Davis has been appointed works manager, Micro-Ferrocarril Products Division, Stamford, Conn., Maguire Industries. John Polonetz has been named chief engineer of the company, and E. Raymond Engstrand, chief metallurgist. Kenneth M. Gleszer has been appointed general sales manager.

Edwin J. Putzell, assistant treasurer, Monsanto Chemical Co., St. Louis, has been transferred to the legal department as assistant secretary of the company. Mr. Putzell joined Monsanto last year,

and served as assistant treasurer, and for a time, also as assistant to Dr. Charles A. Thomas, vice president and research director of the firm. As assistant to Dr. Thomas, he worked in liaison with atomic energy operations at the Oak Ridge, Tenn., Clinton Laboratories, which are operated by Monsanto under contract to the Manhattan District. Mr. Putzell served in the Navy during the war.

Frank J. Kohut has been promoted to general manager, C. M. Kemp Mfg. Co., Baltimore. He was sales manager and chief of development for the company.

Robert C. Schock has been appointed sales engineer concentrating on brewery and distillery equipment parts, chemical section, nickel alloys department, International Nickel Co. Inc., New York. Since 1933, he had been with Schock, Gusmer & Co. Inc., Hoboken, N. J.

R. W. Sharp has been appointed district manager and sales engineer of the new Indianapolis office, Lincoln Electric Co., Cleveland. Mr. Sharp returns to the company after 3 years in the Navy as a welding engineer. He joined the company in 1939, and was covering the Kentucky and southern Indiana territory for the company at the time he joined the Navy. Prior to that, he was assigned to Lincoln Electric's Columbus, O., office.

Harry A. Reed has been elected vice president, Day & Zimmermann Inc., Philadelphia, and will co-ordinate new business activities. Thomas W. Hopper will succeed Mr. Reed as engineering manager, and will have charge of design and engineering for the construction department.

Robert R. Zorn has been appointed personnel director and office manager, Bendix Home Appliances Inc., South Bend, Ind., succeeding E. Robert Clark, who has organized R & R Distributing Co. in South Bend. Mr. Zorn served in the Army during the war. Prior to joining Bendix, he was with the Export Division, Studebaker Corp., South Bend.

Urban C. Weidner, assistant secretary, Union Spring & Mfg. Co., New Kensington, Pa., has also been appointed purchasing agent, succeeding the late Joseph D. Horton.

William K. Greene has been appointed assistant division engineer, Chicago district, American Bridge Co., Pittsburgh, subsidiary of United States Steel Corp. He succeeds T. A. Jordan, who is retiring after 36 years of service with



**D. J. HASINGER**

Appointed general manager, Paul & Baekman Division, Portable Products Corp., Philadelphia, noted in STEEL, Oct. 28, issue, p. 71.



**D. S. HARDER**

Appointed vice president in charge of operations, Ford Motor Co., Dearborn, Mich., noted in STEEL, Oct. 28 issue, p. 59.



**ROBERT F. OHMER**

Appointed vice president in charge of administration, Hydraulic Press Mfg. Co., Mt. Gilead, O., noted in STEEL, Oct. 28 issue, p. 70.

American Bridge. Mr. Green had been an engineer in the company's designing department in New York.

W. M. Woodward has been elected vice president in charge of operations,

Rotary Electric Steel Co., Detroit.

Carroll M. Baumgardner, executive vice president, United States Radiator Corp., Detroit, has been named chairman of the executive committee of Insti-

tute of Boiler & Radiator Manufacturers.

Max F. Lowe, for the last 12 years managing director, California Metal Trades Association, will resign, Jan. 1.

**OBITUARIES. . . .**

Brig. Gen. Leonard P. Ayres, 67, since 1920 vice president, Cleveland Trust Co., Cleveland, and a member of the bank's executive committee for most of that period, died in Cleveland recently. General Ayres attained the rank of colonel in the first world war, and was recalled to active duty in Oct., 1940. He was retired with the rank of brigadier general in 1942. His statistical studies for the Army in both wars covered manpower casualties and logistics, and led to revision of many military policies. General Ayres was economist adviser to the presidents of Chesapeake & Ohio Railway Co. and associated lines.

Joseph D. Horton, purchasing agent, Union Spring & Mfg. Co., New Kensington, Pa., died Oct. 22. He had been with the company the last 35 years.

Stanley M. Prior, 60, distributor sales manager, Fafnir Bearing Co., New Britain, Conn., died at his home in that city, Oct. 22. He had been with the company since 1919.

George A. Harper, 75, president, Burlington Brass Works, Burlington, Wis., died recently.

Howard B. Carpenter, 64, who retired in 1944 as assistant vice president in charge of production, Republic Steel Corp., Cleveland, died Oct. 26 in that city. In 1928, he joined Republic Iron

& Steel Co. as manager of its Youngstown district. Prior to that, he had been with Colorado Fuel & Iron Co., Denver, since 1916. In the beginning, he ran that firm's Pueblo, Colo., coke works. Later, he was promoted to general manager of its steel works.

Johannes van den Broek, 64, president, Billiton Co. (N. V. Billiton Maatschappij), Holland, died in The Hague, Holland, Oct. 22. He joined Billiton when he was 22 years of age, and served in executive capacities with many of the firm's subsidiaries before becoming president of the company. In 1941, he acted as chairman of the Netherlands Purchasing Commission in the United States, a post he relinquished in 1942 to become minister of finance, Netherlands Government in exile.

Howard Walter McAlteer, 76, president, American Steel Export Co. Inc., New York, died in that city recently.

Edwin J. Wilkie, 57, manager, Sales-Technical Division, Bucyrus-Erie Co., Milwaukee, died recently. He had been with the engineering department since 1910.

Thomas Morrison, 84, a former director of United States Steel Corp., New York, died at his home in Spring Lake, N. J., Oct. 26. Mr. Morrison was co-inventor with Julian Kennedy of the Kennedy-Morrison process of slow-cooling rails. He was a cousin and partner

of Andrew Carnegie, and when the latter founded Carnegie Steel Co. in 1891, Mr. Morrison became superintendent of the company's Duquesne, Pa., works. He was general superintendent of the Edgar Thomson works from 1895 to 1901. He was a director of United States Steel Corp. from 1902 to 1911, and from 1914 to 1937, when he retired. Since 1917, Mr. Morrison had been a director of International Nickel Co. of Canada Ltd., Copper Cliff, Ont. He was a member of the Carnegie Hero Fund Commission.

Samuel H. Moore, 65, for many years president, Chisholm-Moore Mfg. Co., Cleveland, and in recent years sales engineer, National Bronze & Aluminum Foundry Co., Cleveland, died in that city, Oct. 29. Mr. Moore was once a director of Glidden Co., Cleveland. He was one of the founders of Steel Improvement & Forge Co., Cleveland.

Charles C. Hanch, 78, a pioneer in the automobile industry, died recently at his home in Chicago. He joined the Studebaker Corp., South Bend, Ind., as treasurer in 1915. He was chief of the automotive products section, War Industries Board, in World War I, and in 1919 was trade commissioner, Bureau of Foreign and Domestic Commerce, Department of Commerce. Mr. Hanch became general manager, Maxwell Motor Co., Detroit, in 1919, and was named executive vice president, Lexington Motor Co., Connersville, Ind., in 1921.

# CASTING

# Magnesium

SAND castings account for the largest proportion of magnesium alloys used for structural purposes. During the war many new magnesium foundries were started and others expanded so that the productive capacity of the country has been enlarged many times.

Frequently the design of a casting and the quantities involved will permit it to be made economically as a gravity-poured permanent mold casting rather than as a sand casting. This process is best adapted to relatively simple castings without complicated coring. Sometimes sand cores can be used to advantage in conjunction with the cast iron molds. In general, the properties of permanent mold castings are approximately equivalent to those of sand castings of the same alloy and heat treatment, and will meet the specifications for such.

The sand foundry practice for magnesium alloys is similar in general principles to that used for other metals. However, there are numerous points of difference necessitated by the ease of oxidation of magnesium at temperatures above the melting point of approximately 1125° F, a rather high shrinkage (3/16-in. per foot when unrestrained), and by the low density of the molten metal, which is slightly more than 1.5 at 1300° F.

The first of these characteristics requires that oxidation inhibiting agents be present in the sand and that special fluxes be used in the melting operation. Special methods of gating, venting, and risering castings have been developed to offset the problems brought about by high shrinkage and by the light weight of the molten metal.

**Alloys and Casting Design:** The bulk of the magnesium sand castings produced in this country is made from the two compositions listed in Table IX. Most permanent mold castings are made from alloy C. The selection of the alloy for a given application is based on properties and characteristics; some typical mechanical properties are given in Table X.

Precautions should always be taken to avoid conditions leading to a local stress concentration in magnesium alloy castings. Tool marks, notches and sharp corners provide such stress concentrations and should be eliminated, particularly if the castings are subject to vibration or frequent stress reversals. Generous fillets and radii, beaded holes, and gradual section changes will insure against such concentrations of stress, Figs. 9 and 11.

Particular attention should be paid to section changes. Where a relatively thin wall joins a thicker wall or a large boss, the thin wall should be gradually tapered or blended into the heavier section. Typical principles involving good casting designs are illustrated in Fig. 7, prepared by Dow Chemical Co. The stamping of pattern numbers, part numbers, batch numbers or symbols designating heat treatment, should be done on a pad raised 1/16 to 3/32-in. above the surrounding surface. Pads should be located away from areas which will be subjected to maximum stress during service.

**Molding Sands:** Magnesium sand castings are made in "green" sand molds or less commonly, in "dry" or baked sand molds. The latter are similar to baked sand cores in composition and treatment. Magnesium castings are molded in both natural and synthetic sands. It is desirable that the sand should be as open as possible, consistent with obtaining the degree of surface smoothness required. The more open sand is desirable for two reasons: Magnesium alloys are so light that an open sand permits the metal to flow into the mold cavities with very little back pressure from the air in the mold, and the open sand requires less tempering water and evolves less steam. It also permits the steam generated to escape quickly, thus decreasing tendency for reaction between steam and metal. The

# Alloys

**Modern foundry practice in sand and permanent mold casting is covered in this second of a series of magnesium articles**

By ALLEN G. GRAY  
Consulting Editor, STEEL



Fig. 6 — Pouring a magnesium sand casting

Fig. 7 — Typical principles involving good casting design are illustrated

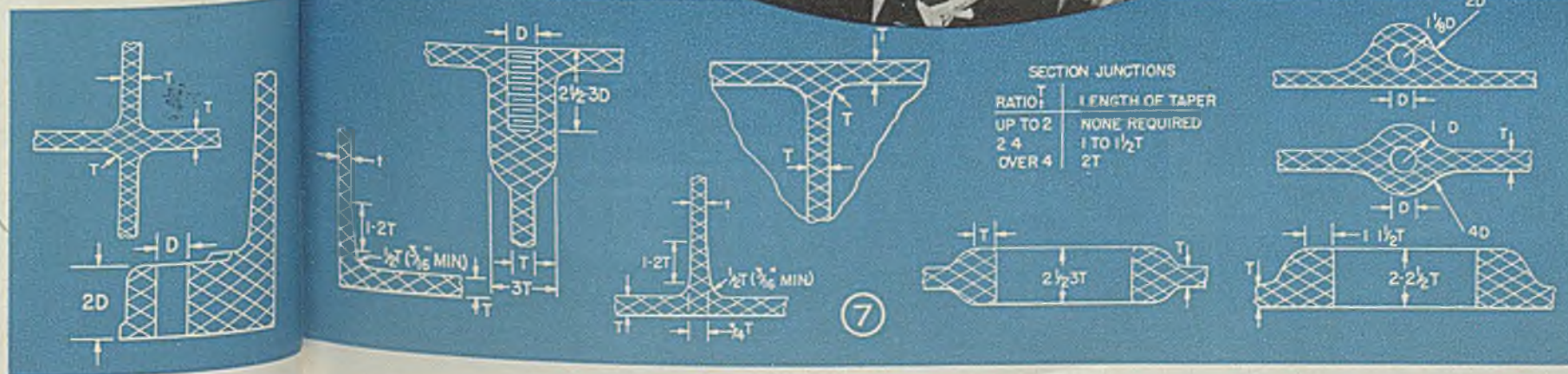


TABLE IX  
COMPOSITIONS AND CHARACTERISTICS OF MAGNESIUM SAND CASTINGS

A.S.T.M. Alloy No.	Chemical Compositions—Per Cent—						Other* Lupur.	Max. Magnesium	Remainder	Characteristics and Uses
	Aluminum	Manganese	Zinc	Silicon	Other*	Lupur.				
C AZ92	8.3-9.7	0.10 min.	1.7-2.3	0.5 max.	0.3	Remainder			As cast Heat treated—HT Heat treated and aged—HTA	For castings requiring moderate strength and toughness. For castings requiring high strength and best toughness. For castings requiring high yield strength and hardness.
H AZ63	5.3-6.7	0.15 min.	2.5-3.5	0.5 max.	0.3	Remainder			As cast Heat treated—HT Heat treated and aged—HTA	For castings requiring moderate strength and toughness. For castings requiring high strength and best toughness. For castings requiring high yield strength and hardness and moderate toughness.

\* Copper, max. 0.05 per cent. Nickel, max. 0.03 per cent.

Note: Alloy C is used for maximum pressure tightness and Alloy H is used for best salt water resistance.

TABLE X  
MECHANICAL PROPERTIES OF MAGNESIUM SAND CASTINGS

Alloy	Condition	Tensile Strength lb. per sq. in.		Yield Strength <sup>1</sup> lb. per sq. in.		Elong. in 2-in. Per Cent		Compressive Strength psi	Shear Strength psi	Rockwell "E" Hardness	Brinell Hardness	Impact Izod, ft.-lb.	Fatigue <sup>2</sup> Endurance Limit, psi
		Typical	Specified Minimum	Typical	Specified Minimum	Typical	Specified Minimum						
C	As cast	24,000	20,000	14,000	10,000	2	1	51,000	.....	68	60	1	11,000
	Heat treated	39,000	30,000	14,000	10,000	10	6	52,000	.....	66	59	4	11,000
	Heat treated and aged	39,000	32,000	21,000	18,000	3	1	58,000	.....	85	77	1	11,000
H	As cast	27,000	24,000	12,000	10,000	5	4	45,000	16,000	59	55	3	10,000
	Heat treated	38,000	30,000	12,000	10,000	11	6	46,000	16,000	60	55	5	10,000
	Heat treated and aged	38,000	32,000	19,000	16,000	5	2	50,000	18,000	74	70	2	10,000

<sup>1</sup> Yield strength is defined as the stress at which the stress-strain curve deviates 0.2 per cent from the modulus line.

<sup>2</sup> Fatigue endurance values are obtained on R. R. Moore machines and are based on 500 million cycles.

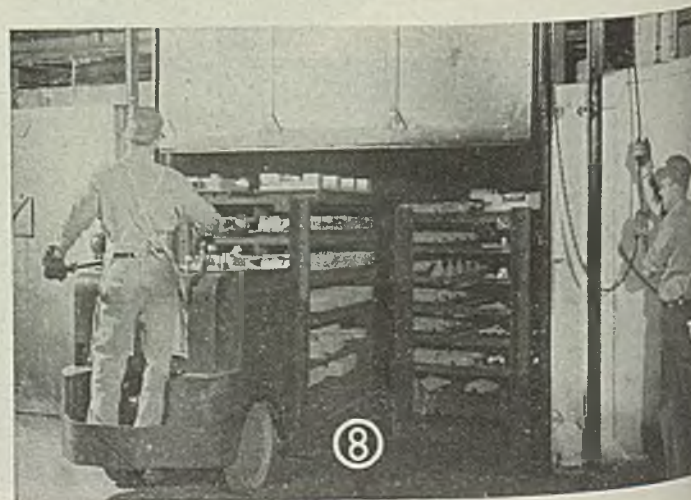
TABLE XI  
COMPOSITION AND CHARACTERISTICS OF FLUXES FOR MAGNESIUM

Flux No.	Composition	Use	Amount of Flux Present in Pot during Operation, Per Cent	Approximate* Net Consumption of Flux Per Cent	Characteristics and Remarks
230	55.0 KCl 34.0 MgCl <sub>2</sub> 9.0 BaCl <sub>2</sub> 2.0 CaF <sub>2</sub>	Sand and permanent mold casting Premelting Alloy production Scrap recovery Flux pots	10-20 5-10 10-20 10-20 100	4-6 2-4 3-6 4-15 <0.5	Characterized by high fluidity of surface film protection, allowing parting and recovering for ladling operations. High refining qualities. General open-pot flux.
250	23.0 KCl 72.0 MnCl <sub>2</sub> 2.5 BaCl <sub>2</sub> 2.5 CaF <sub>2</sub>	Alloying	0	Variable	Used for introducing manganese into alloys made by open-pot process with 230 flux. Reaction products approximate 230 flux behavior. Flux contains 31.7 per cent manganese by weight.
310	20.0 KCl 50.0 MgCl <sub>2</sub> 15.0 CaF <sub>2</sub> 15.0 MgO	Sand and permanent-mold foundry Crucible alloying Die-cast scrap refining	1-3 2-5 2-5	3 2-5 2-5	Crucible-type flux characterized by being fluid at start for melting and refining, then drying out to crust that can be removed or held back for direct pouring.
320	78.0 MnCl <sub>2</sub> 13.0 CaF <sub>2</sub> 11.0 MgO	Crucible alloying	0	Variable	Used for introducing manganese into alloys produced by the crucible process with 310 flux. Reaction products approximate 310 flux behavior. Flux contains 33.5 per cent manganese by weight.

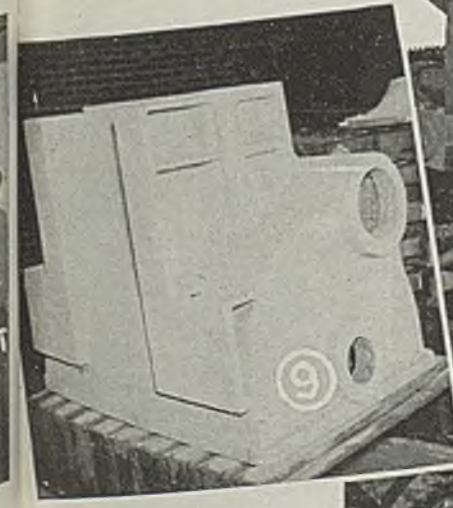
\* Based on weight of metal poured from a given operation.

natural sands of the Albany and Champion types are used in several foundries. The average grain fineness is from 100 to 150 with an AFA permeability ranging from 10 to 25. They contain 10 to 12 per cent clay and require about 6 per cent water for tempering. Foundries operating with natural sand generally use the heap method, and recondition their sand with equipment of the aerator type with only occasional milling, if any. The high water content of the natural sands results in considerable steam formation as the mold is filled.

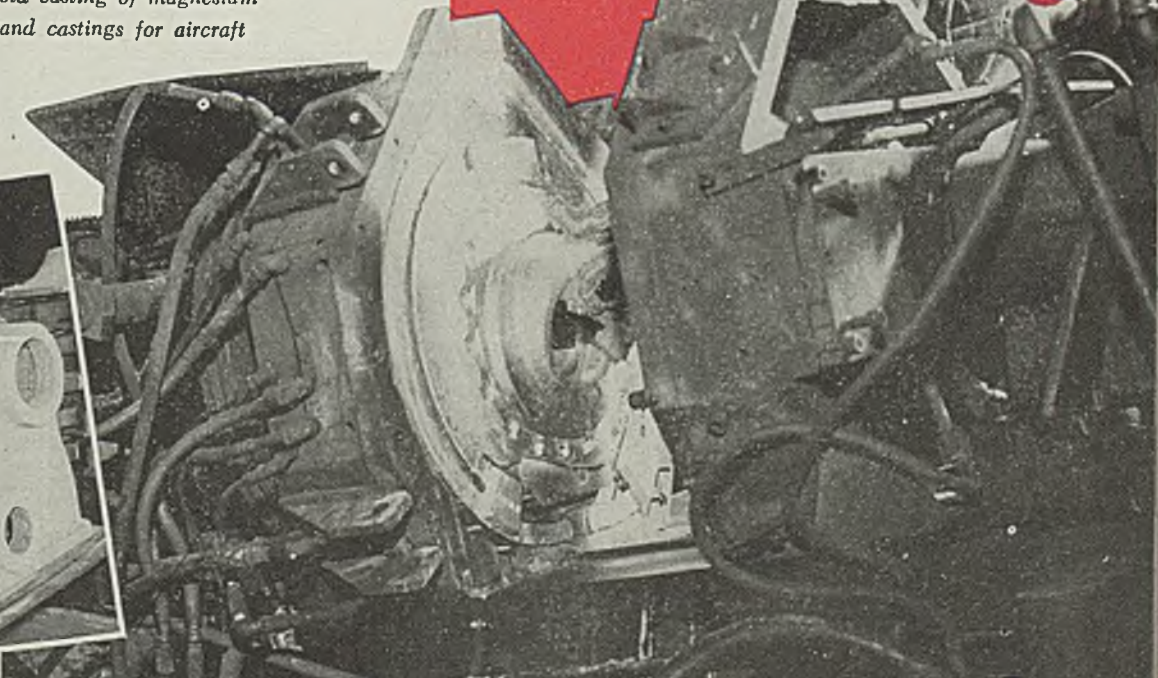
This fact, combined with poor venting due to low permeability, necessitates the use of rather high quantities of inhibitive agent to prevent surface oxidation or "burning". As much as 10 per cent agent may be added, and this amount may not be adequate on heavy sections. More open sands should be used if any sections more than 2 in. thick are regularly encountered. Misruns, cold shuts, and



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other casting defects also may be caused by too slow venting of the mold air during the filling of the mold. Subject to the limitations just described, natural sands may be used for the production of light to medium-sized castings.

Synthetic molding sand is being used to an increasing extent in magnesium foundries. The synthetic sands preferably are made from a washed silica base with an AFA grain fineness of 65 to 100, muller with 3 to 4 per cent bentonite and about the same amount of water. Bank sands also may be used if free from roots, coal, or other organic matter which might cause blows. The sand is conditioned after each use, tempering, mulling, and aerating being done in standard equipment.

Strength will be affected slightly by the kind and amount of addition agent in the sand, and greatly by mulling, which should be done thoroughly between each use. Very dry sands, while entirely adequate from the permeability standpoint, may tend to dry out easily and leave rough surfaces on the castings. The former tendency may be overcome by the use of approximately 1 per cent ethylene glycol in the sand. Smoking of the mold surface is practiced in foundries using such open sands and may be of value in improving the casting surface.

**Sand Agents:** It is desirable that all green molding sand be treated with a chemical agent to inhibit the action of the water vapor upon the hot metal. Foundries at present are using combinations of several agents. One is a mixture of sulphuric acid, borax and sulphur. Better protection, especially necessary with low permeability sands, is obtained by replacing part of the sulphur and boric acid with fluoride salts. Potassium fluoborate and ammonium fluoborate are used for this purpose.

In general, the total amount of inhibiting agent will range from 4 to 10 per cent by weight, depending on the sand used and the section thickness of the castings produced. The larger amounts will be required for the lower permeability sands and for mas- (Please turn to Page 130)

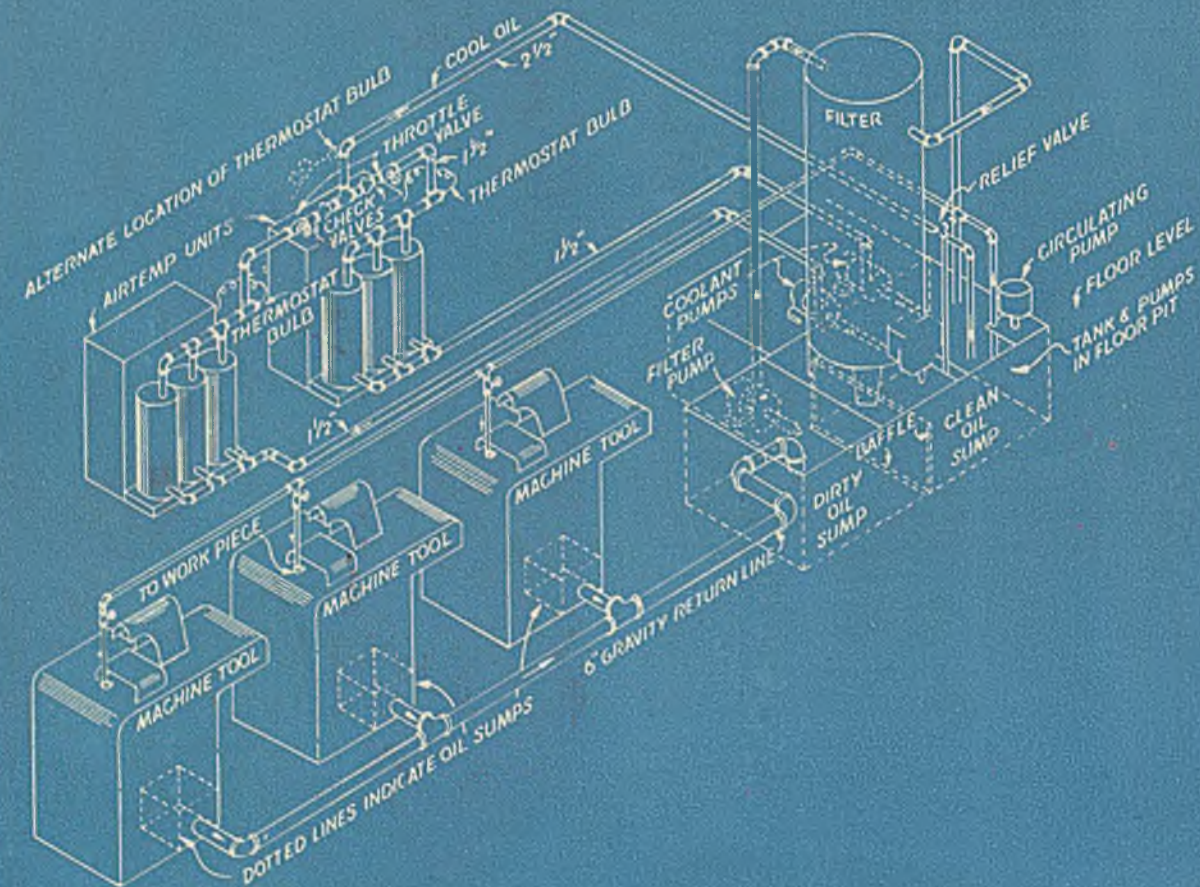
Fig. 8—Cores being placed in baking oven

Fig. 9—Sand cast pump base weighs 950 lb

Fig. 10—Permanent mold casting of magnesium

Fig. 11—Magnesium sand castings for aircraft

# LIQUID COOLERS



96

Packaged units for controlling coolant temperature during high speed machining operations prove value in uniform results, prolonged tool life, fewer machine adjustments and higher output

HIGH TEMPERATURES generated in cutting tools operating at high speeds can cause tool failure—often even after a relatively short period of operation. The excessive heat that is thus produced may cause a loss in hardness of the tool edge, a welding action between tool and chip, or both. Nor does the use of coolants always insure trouble-free operation. Resorting to the expedient of “flooding” the work and tool to dissipate this heat is invariably a costly and inadequate solution to the problem. But by directing a stream of refrigerated cutting oil or coolant on the work and tool edge, this trouble can be eliminated.

At the higher speeds at which machining operations have been carried out, the coolants used—to carry off heat from the point of cut, to lubricate the cut, to improve the finish, to prevent rusting, and to flush out the cutting area and carry away the chips—have risen above a proper working temperature. Direct results of these higher speeds in prolonged operation have been variations in the size, shape and location tolerances of the work-piece and of the machine itself. This has created a much higher percentage of rejects, especially on work where adherence to close tolerances is absolutely necessary. Production has been materially reduced, with a corresponding increase in production cost per unit. The variations stemming from temperature build-up also are responsible for shorter tool life and require frequent machine adjustment.

On the basis of studies made during the past year of many machine tool operations, the conclusion has been

reached that refrigeration of the coolant, maintaining it at constant temperature anywhere between 65 and 95° F depending upon speed with which heat must be removed, not only forestalls unfavorable conditions previously mentioned but, in some cases, is the only means by which utmost efficiency and uniform results can be insured.

In addition to enabling generally greater precision and stepped up output per machine, refrigeration of coolants through the medium of “packaged” liquid coolers has been credited with (a) reducing the cost of perishable tool replacement by holding down temperature at point of cut and thus preventing metal build-up on edge of cutting tool; (b) keeping work coming off a machine tool cool enough to handle, gage, and immediately pass on to the next operation; (c) holding cutting oil not only at proper temperature but at its original viscosity by preventing rises of 20, 30 and up to 70 degrees in one day; (d) minimizing tool run-outs; and (e) reducing water consumption when water is used to cool a machine tool.

The war afforded many opportunities to test the efficiency of coolant refrigeration. One plant was drilling Bofors gun barrels two at a time on a deep-hole horizontal drill with 30-ft bed. Tools in the drill had but one cutting edge whose length was equal to the radius of the hole being drilled in the guns.

A two-lip or spade cutter was installed in an effort to reduce drilling time from 4 to 2 hours. During the changed operation, the cutting (Please turn to Page 142)

Fig. 1—Three Airtemp units comprising central installation at Wilkening plant. Functions are interlocked; each unit provides 3 tons of refrigeration and handles 30 gallons of coolant per minute

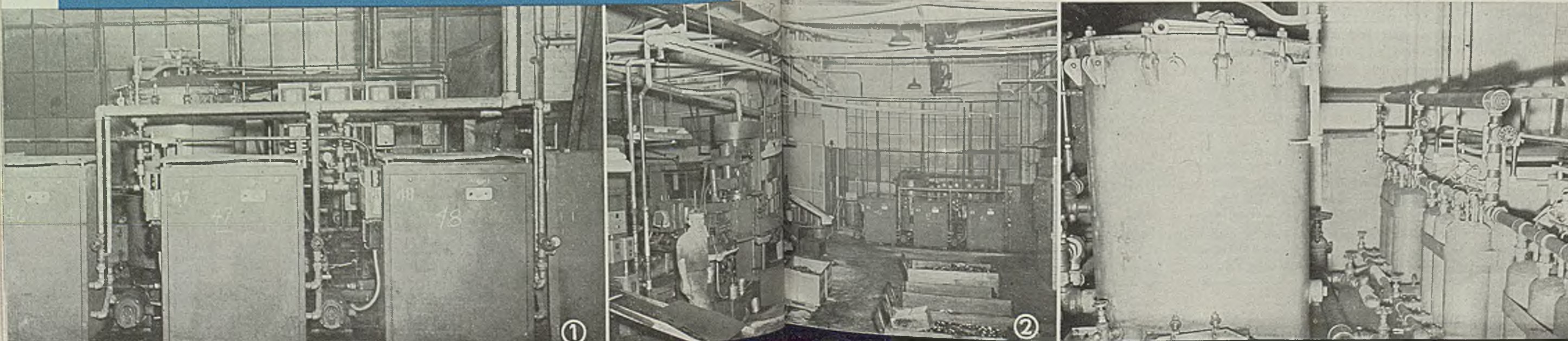
Fig. 2—Grinder line at left is supplied with coolant piped from central plant at right rear. Operation is entirely automatic. One cooler goes into operation when one or more grinders are put to work; when coolant temperature rises above predetermined point, second unit

starts operating; when temperature again rises, third unit begins to function

Fig. 3—Rear view of central installation showing portion of distributing system, coolant headers and condensing units at right and filter at left

Fig. 4 (left)—Schematic of layout for multiple operation of a number of tools from one or more liquid cooling units. Separate circuits are provided for cooling, filtering and circulating the coolant

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# Simplification and Standardization of **STEELS FOR NAVAL AIRCRAFT**

Review of current and pending policies derived from wartime experience by the Navy's Bureau of Aeronautics which may lead to appropriate choice of materials, closer control of steel specifications and full use of special properties of each type and grade selected

FIGHTING war recently terminated, emphasized several cardinal principles which can be used to advantage in postwar activities, both commercial and military. These run the whole gamut from research through end-product utilization, and embrace development, design, material selection, fabrication, procurement and all that these connote.

As explained in greater detail below, they result in greater emphasis on specifying requirements in terms of end-products, and in mapping a comprehensive research and development program leading to better understanding of the behavior of metals under stress, a sounder, more efficient basis for selection of proper materials for a range of applications and conditions never before confronting engineers. While remarks to follow utilize, for most

part steel and related materials, their implications are by no means so restricted.

In considering procurement and steel specifications, there are fundamental differences in government purchasing, as compared to industrial purchasing, which must be reflected in government specifications. For example, the necessity of generally assigning a government contract to the lowest bidder, whose bid was based on a specification, means that specification must be much more complete and must protect government interests than in the case of a private firm which may give its contract, based on a much looser specification.

It seemed to those concerned with the availability of material that at some stage of the war practically every material or basic component thereof had its

interval of being in "short supply." Reasons for this are not hard to find: Filling the pipelines demanded large quantities; extreme production surges consumed existing stocks; sources of raw material were drained; imports of materials not domestically available in adequate amounts were disrupted by transportation difficulties, by loss to the enemy, by local fighting, necessity for distribution to other allies, unavailability of labor, etc.; local peak demands caused local shortages; new or emergency military demands created unanticipated complications; labor and facility shortages slowed production; conversion from "critical" materials to substitutes often made those substitutes "critical"; etc. to a wearying degree.

Two important doctrines became evident. First, it was important that technical requirements for material expressed in form of specifications be standardized. Minor variations in requirements meant additional production, duplication, unnecessary stocks. Fortunately, the military air services—the Army's and the Navy's—even prior to the outbreak of hostilities embarked on a vigorous standardization program, in the form of Army-Navy aeronautical specifications and standards. Not only were many of these available for use covering the major steel products, but the mechanism for expanding these specifications and standards had become firmly entrenched and was working smoothly, through the co-ordinating medium of the working committee



By N. E. PROMISEL  
Chief Metallurgist, Bureau of Aeronautics  
Navy Department  
Washington

of the Aeronautical Board. In addition, further simplification and standardization of Bureau of Aeronautics' procurement was being implemented through the use of federal specifications and Navy Department specifications. Thus it was possible to reduce very significantly, in a short time, the number of specifications used for procurement, and to prepare expeditiously such other specifications needed. For example, once necessary minimum laboratory work was completed, Army-Navy aeronautical specifications for national emergency steels were prepared, co-ordinated between the Army Air Forces and the Bureau of Aeronautics, and printed all in approximately one week.

Second important point emphasized by the repeated cases of materials in "short supply" dealt with preparing specification requirements from the viewpoint of end-product description and inspection rather than procedure for arriving at the end-product wherever this was practicable. For example, specifications for even the most important aircraft steels did not limit the method of melting and production to electric-furnace usage. Open-hearth or even crucible (Please turn to page 113)

## Seen and Heard in the Machinery Field

By GUY HUBBARD  
Machine Tool Editor

**INDUSTRY BEGETS INDUSTRY:** In discussions of the American or interchangeable system of manufacturing, much has been said and much has been written about subdivision of labor in the sense that many people, working co-operatively, now do jobs formerly done by individual Jacks-of-all-trades. That state of affairs is pointed to as one of the reasons why the interchangeable system means more jobs for more people.

Not so much has been said, however, about the tendency of big industries to beget small industries which take over certain highly specialized functions of the parent industries, thereby making more jobs for more people. An excellent example of this is given in the birth and rapid development of the big family of shops which constitute the contract tool and die industry.

I am writing this item in Chicago immediately after participating in the first full-scale national convention of the trade association of this relatively young family of relatively small industries begotten by big industries. I am most favorably impressed by the high caliber of the working executives who within three years have built up the membership of their National Tool and Die Manufacturers Association from about 80 to nearly 500 contract tool and die shops.

This strong national association now gives these hundreds of tool and die shops means for united action, it provides them with a national spokesman. Its headquarters in Cleveland has become a central source of dependable information on how to improve methods and how to broaden markets.

Those who don't like the American way-of-life, profess to see in the current tendency for American industry to subdivide and to decentralize, their ready-made opportunity to "divide and conquer." Those plans won't get very far if every industry subject to physical subdivision and decentralization will strengthen its spiritual bonds. In that way every one of these industries can continue to be in effect "one big family," just as the Tool and Die Industry now is.

**YEARS AND GEARS ROLL ON:** Since 1937, except for the period when such gatherings were ruled out by the war, it has been my privilege twice each year to attend national conventions of the American Gear Manufacturers Association. It so happens that I am writing this between sessions of the 30th semiannual meeting of this Association at Edgewater Beach Hotel, Chicago.

When I attended my first meeting of this "Engineering

Body of the Gearing Industry," AGMA already had been carrying on its good work for 20 years. Already it had accomplished a great amount of good in the direction of standardization, improved design and manufacturing practices and better commercial practices throughout the gear making and gear using industries.

Since that time AGMA has increased greatly in size and in prestige. Its outstanding contributions toward the winning of the war—both as an association and through the untiring efforts of its individual members—is too little known and too little appreciated.

The public generally is gear-conscious only when unsatisfactory gearing is involved. There was plenty of unsatisfactory gearing in the so-called good old days. That is why we had jumpy, flickering movies. That is why shifting gears in the old-time automobiles used to be a major and dreaded operation. That is why machine shops used to be unduly noisy. That is why mechanisms were unduly heavy and bulky.

Various reasons have been advanced as to why early inventors—including Leonardo da Vinci—were unable to build satisfactory working models of the basically practical mechanisms which they dreamed up. The reason most frequently mentioned is: "Lack of machine tools." A reason which I believe to be equally as important is: "Lack of knowledge of gearing." If you doubt that, take a look at the fine engravings by the famous artist Albrecht Durer of the self-propelled floats which he designed for the triumphal parade staged by Emperor Maximilian.

His mechanisms are remarkable, but his gears are terrible. Even at that, many equally as bad have been made within our time—at least up to the advent of AGMA. Did you ever crank a "pre-AGMA" ice cream freezer out in the woodshed on a hot summer day? If you did, the chances are that you became acutely gear-conscious.

Most associations feel that it is their duty to make the public conscious of their commodity. Not so in the case of AGMA whose slogan might well be: "Make the public gear-unconscious by making better gears!"

**THUMP, THUMP, THUMP:** Here is a brief dissertation by this inveterate convention attendee on a subject which should be dealt with under the heading, "Heard but Not Seen in the Machinery Field."

I am not referring to the throbbing tom-tom performance which furnished the terrifying "background music" during the stage presentation of "The Emperor Jones." I am referring to that annoying sledge-hammer-and-star-drill performance on a concrete wall which almost inevitably accompanies main speakers at industry conventions at any top-flight resort hotel.

It seems as though there must be some union rule which demands that no speaker in behalf of industry shall hold forth in any public room in any resort hotel unless accompanied by the labor representative who does his stuff with sledge hammer and rock drill on the nearby concrete wall. If so, does he come under jurisdiction of J. Caesar Petrillo or John L. Lewis?

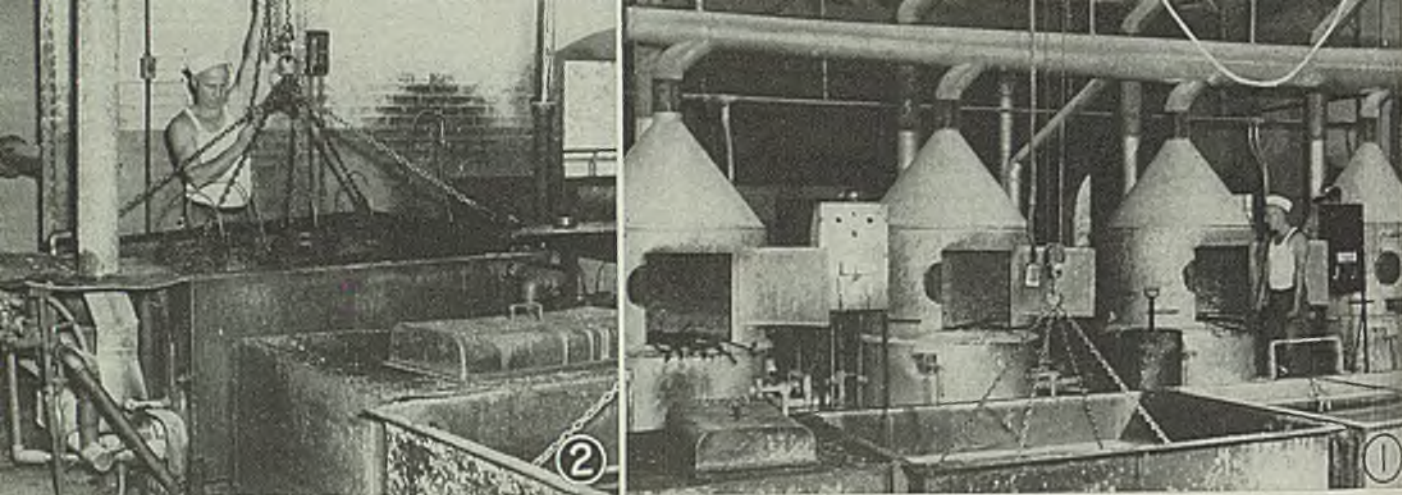


Fig. 1—Four gas-fired pot furnaces, each hooded to carry off products of combustion. Quenching tanks in the foreground simplify handling of parts

Fig. 2—Gas-fired immersion burner here heats wash tank solution for cleaning parts after quenching

R A P I D

# Case Hardening Steel

Controlled accurately to give repeated identical results, process surface hardens steel to any desired depth from 0.002 to 0.035-in., providing maximum required case in about 4 hours

ALTHOUGH not a new process, method of surface-hardening steel developed by Chapman Valve Mfg. Co., Indian Orchard, Mass., was used extensively during the stress of war production to surface-harden steels in a minimum of time. Called Chapmanizing, it found wide acceptance among those desiring extreme hardness and wear resistance.

The process is rapid and accurate. It produces a case of any desired depth, from 0.002 to 0.035-in., and maximum required case may be secured in approximately 4 hours. The process also can be controlled accurately, to give identical results, cycle after cycle, to meet any given specification.

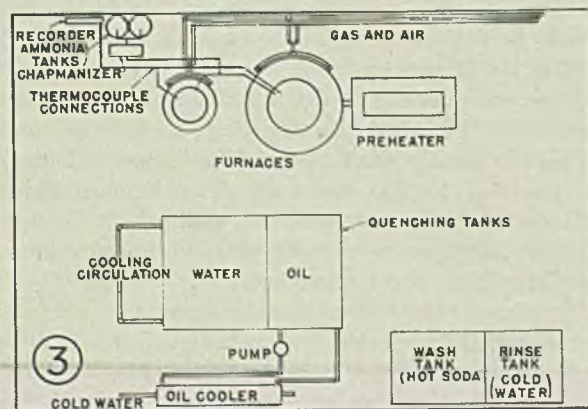


Fig. 3—Floor plan of hardening setup. Note location of Chapmanizer in relation to other equipment—upper left corner. All photos courtesy American Gas Association

The Indian Orchard company operates a job hardening shop and uses gas-fired pot furnaces in connection with the hardening process. The process involves addition of nitrogen into iron base alloys by heating the metal in the presence of a nitrogenous material. It enables manufacturers to substitute free machining steels in many instances. The Chapmanized case, though extremely hard, has sufficient ductility so it will not chip or flake under hard service and will not crack, even when parts are subjected to considerable bending. About one-half of this case is of extreme hardness and is clearly visible from a fractured sample.

Maximum hardness of the case by this processing is found at approximately 0.002 to 0.003-in. under the surface. It is recommended, however, that parts be left slightly oversize to permit a lapping or finish grinding operation. The process is founded on the fact that iron base alloys will absorb certain hardening elements when heated either above or below critical temperatures of the alloys. This is accomplished by heating the metal in the presence of active nitrogen. A liquid bath is used to convey necessary heat and active nitrogen direct to the metal under treatment and the nitrogen penetrates the surface of the metal. Anhydrous ammonia gas is supplied from pressure tanks to the Chapmanizer which is the essential part of the equipment. The ammonia gas undergoes an electrical reaction producing an active nitrogen gas which is delivered to the liquid bath.

The liquid bath has distinct advantages over other methods. It permits uniform and rapid heating, flexible operation and ease of control. It is nonfuming at temperature of normal operation and is noncorrosive. It also remains stable and retains its properties with no additions other than those due to normal dragout.

Work to be treated is placed in the bath at room temperature or preheated, as the case may require. Upon immersion, it becomes coated instantly with a layer of solidified compound which melts (Please turn to Page 146)

# Reducing CAST IRON GRAIN GROWTH

By H. J. NICHOLS  
Welding Metallurgist  
Physical Metallurgy Research Laboratory  
Bureau of Mines  
Ottawa, Canada

SERVICE temperature range of plain cast iron may be extended to 1600°F through use of a process for protecting the entire surface area against atmospheric corrosion. Such processing has done away with the necessity of rejecting cast iron for service at temperatures over 800°F. This process, called Metcolizing, and developed by Metalizing Engineering Co. Inc. of Long Island City, N. Y., has been found to stop effectively the phenomenon of growth in cast iron subjected to high temperatures for long periods.

Three factors, effects of which are additive, cause growth in cast iron at high temperatures. Thermal expansion, which cannot be prevented and which must be taken into consideration in design, is the first factor. The second factor is also unavoidable—graphitization of pearlite. The third, and by far the most important, is due to the oxidation of the graphite flakes that come to the surface of the metal. It is this factor that can be offset by protective coatings.

Carbon monoxide and carbon dioxide are formed at high temperatures when oxygen unites with graphite carbon. These gases readily escape, leaving cavities in the cast iron which are rapidly attacked by oxygen with resulting formation of various iron oxides. Since this attack is continuous and since the oxides filling the cavities have a greater volume than the iron from which they are formed, there is an expansion of the whole casting. This expansion, in turn, allows still deeper penetration of oxygen and consequently resulting expansion becomes progressively greater.

When service conditions prevent expansion of the casting, failure occurs by buckling. Even without buckling

there is a serious loss in strength and an increase in brittleness. Occasionally, in severe cases of growth, cast iron becomes useless as an engineering material.

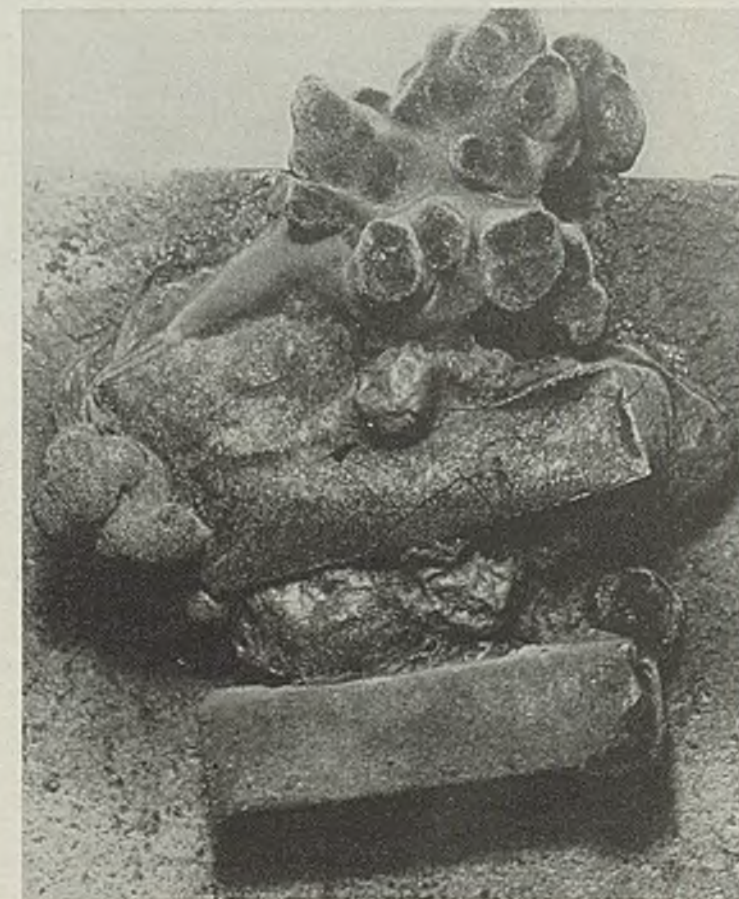
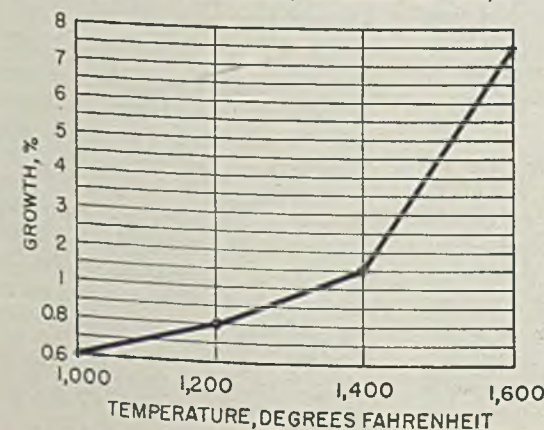
The Physical Metallurgy Research Laboratory, Bureau of Mines, Ottawa, Canada, has been investigating means of controlling growth in cast iron. Two methods are under test: Metcolizing and the addition of chromium to the cast iron. It has been found that the addition of chromium will prevent growth but its use makes the molten metal more sluggish and therefore more difficult to cast. A change from the normal cupola practice is also required.

Although the New York company has several variations of the Metcolizing process to meet varied conditions found in different installations, the Canadian laboratory tested only one, process No. 11, as it is the cheapest and is capable of providing an intermetallic alloy on the surface of the cast iron after heat treatment.

Process No. 11 will protect iron or steel surfaces against corrosive action of hot gases. Surface to be protected is first grit blasted and metallized with an aluminum coating, to which a sealer is applied. The article is then heat treated to cause penetration of aluminum into the iron or steel surface. The purpose of (Please turn to Page 148)

Fig. 1 (below)—Growth of unprotected cast iron samples after 100 hours exposure at indicated temperatures

Fig. 2 (right)—Two cast iron samples after accidental exposure to temperature in excess of 1800°F for approximately 20 hours. Top sample, almost completely decomposed, was unprotected against growth. Bottom sample, having been Metcolized, retained its shape



POSTWAR use of that military vehicle, the jeep, seems to be expanding in many fields. From Milwaukee, A. H. Friese of Welding Engineering Co. reports that by special designing the standard jeep was arranged with a power takeoff from which V-belts are used to drive a 200-amp welding generator. The unit is very flexible and can be used advantageously by industrial plants, airports, shipyards, railroads, utility companies and job welders.

LATEST development for extinguishing fires in flammable oils, paints and varnishes is an airfoam-generating nozzle now in process of manufacture by American-LaFrance-Foamite Corp., Elmira, N. Y. Simple to use, it can be operated easily by plant personnel. The dual-purpose nozzle mechanically creates foam through a scientific mixing of water, air and foam-making liquid. It can be operated as either a foam stream or clear water stream instantly by removing a pickup tube connected to foam liquid. Patent for the fast-acting nozzle is pending.

FOLLOWING proposals made recently by the Safety Bureau of the Civil Aeronautics Board, the Pittsfield, Mass. plant of General Electric Co. received orders to furnish a large aircraft company with samples of silicone oil for testing purposes. The product is considered by the board to be less inflammable than conventional products. The Naval Research Laboratory also placed its stamp of approval on the product following exhaustive tests. GE is now in the process of constructing a new plant for the manufacture of silicone products at Waterford, N. Y. It is expected to be ready for operation near the end of this year.

ANOTHER structural problem looming in the high-speed future of aircraft is posed by the tremendous heating action of air friction against the wing and fuselage. Even at speeds we are already flying, problem of skin friction heating has become significant. For example, the cabin of the P-80 Shooting Star heats up to 50° F higher than the outside air at a speed of 550 mph. According to the National Advisory Committee of Aeronautics, Washington, tests show that at the speed of sound a rise in temperature of 150° F is reached. At speeds greater than that of sound, friction temperatures exceed the limits of human endurance, increasing more than 360° F at twice the speed of sound. Now in

progress are investigations of different methods of cabin refrigeration involving extremely lightweight and compact units to solve this problem.

"PEBBLE heater" is the term applied to a new form of heat transfer unit developed by Babcock & Wilcox Co., New York. It is reported capable of heating gases above operating temperatures permissible in metallic heat interchangers. Principle involved consists of raising to high temperatures a constantly moving column of pebbles made of a heat-resistant nonmetallic material, then passing the gas to be heated through interstices of the moving pebble column. According to C. L. Norton Jr., technical director of the company's refractories division, the unit was used successfully to heat air to 2300° F, and steam to 1800° F. One of its first applications was heating of air used for combustion of fuels.

BOTH melting and casting are accomplished rapidly with the equipment for precision investment casting now being demonstrated in New York city by Alexander Saunders & Co. It combines induction melting with centrifugal casting in a single unit, melting metal by high frequency in a casting crucible on the arm of the motor-driven machine. When metal is brought up to temperature, it is cast centrifugally into the burned-out flask without further handling. Flasks are burned out in a conventional gas-fired oven. Capacity of the crucible for industrial casting is about 2 lb of steel.

COMPLETE line of metal parts vapor degreasers in standard and special models is now being marketed by Optimus Equipment Co., Matawan, N. J. The company reports the new equipment will include units for a wide range of applications—among these, vapor, vapor-spray, liquid-liquid-vapor and liquid-vapor as well as combinations of these. Optimus Detergents Co., also of Matawan, and an affiliated organization, is to carry vapor degreasing solvents required by users of the equipment.

THREE dimensional models are being used by Westinghouse X-Ray division to assist rehabilitating and expanding the nation's war-worn x-ray facilities. The models—to be offered first to the medical profession and under consideration for industrial x-ray users as well—permit duplication of existing or proposed facilities in miniature and make possible endless arranging and rearranging until

each room and every unit of apparatus is located to the satisfaction of the architect. Each model kit is composed of about 1000 individual pieces, each scaled so 1 in. represents 1 ft of actual size. Models of x-ray equipment, walls, windows and doors are of wood, metal and plastic and finished to resemble the actual unit.

TOUGH skin over a nonhardening base is formed by a fluid compound made by DuBois Co., Cincinnati, when sprayed or brushed on interiors of paint spraying booths. Because its base never sets hard and the skin effect provided paint penetration and adhesion is halted. The compound, called Filmite, is water soluble, thus easy to wash off, noninflammable and nontoxic. It is said to save up to 90 per cent in labor in booth cleaning.

INSTALLATION of heating and control equipment in old buildings is simplified by use of a new type electric saw with tungsten carbide teeth recently developed by Minneapolis-Honeywell Regulator Co., Minneapolis, Carboly Co. Inc., revealed in Detroit. The 5-in. saw, used with a Black & Decker type ¼-in. drill which provides a right angle drive, cuts smooth clean grooves in plaster or concrete walls and floors. A special suction guard attached to a vacuum cleaner picks up all dust or loose material in the cutting process, simplifying clean-up.

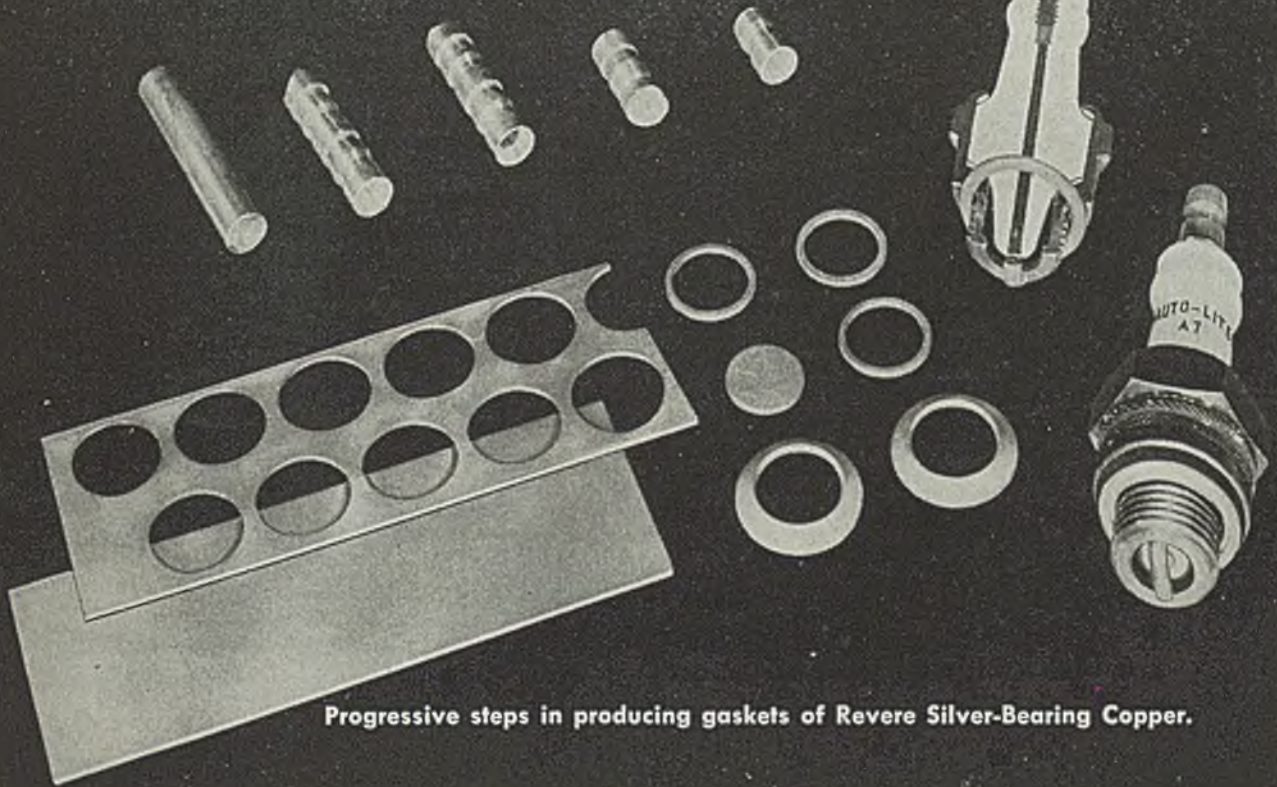
COLD-rolled and cast iron burning racks, burning tools, furnace interiors and ladle linings can be protected by a semiglassed, porcelain-like finish now manufactured by O. Hommel Co. at Pittsburgh. When sprayed or brushed over furnace brick and clay, it seals all crevices. Corrosive action of gases, flue dust and slag is materially reduced and the furnace retains its heat in a highly satisfactory manner. The finish also prevents burning racks and tools of cast iron and steel from sealing.

INTERESTING suggestions on how to polish stainless steel used for brewery tanks to eliminate crevices in which bacteria may develop were given by J. A. McWilliam, T.D., M.A., at the annual meeting of the Sheet and Strip Metal Users' Technical Association in England, according to "Sheet Metal Industries" of London. Mr. McWilliam points out the first necessity is to use iron-free emery. Polishing is done with an ordinary portable polisher, or one fitted with a flexible drive. Also it is advisable to start with



# SPARK PLUG ILLUSTRATES VALUE OF CAREFUL SELECTION AMONG REVERE METALS

Progressive steps in machining terminals out of Revere Free-Cutting Brass.



Progressive steps in producing gaskets of Revere Silver-Bearing Copper.

THE automobile industry, an important Revere customer, is noted for the extreme care it uses in selecting among the many Revere Metals. This careful selection assures speed and economy in manufacture, and protects reliability of operation in the hands of the ultimate user.

Take, for example, the Auto-Lite Spark Plug. The terminals are made by the millions in automatic screw machines. The stock is Revere Free-Cutting Brass, which permits high turning speeds, accurate threads, and a fine finish.

Gaskets, three to each plug, are punched and formed out of Revere Silver-Bearing Copper. This metal was chosen in order to prevent annealing during operation, thus retaining the spring tension which is necessary to prevent leakage or "blow-by" past the gaskets.

Revere Metals include: *Copper and Copper Alloys:* Sheet and Plate, Roll and Strip, Rod and Bar, Tube and

Pipe, Extruded Shapes, Forgings; *Aluminum Alloys:* Tube, Extruded Shapes, Forgings; *Magnesium Alloys:* Sheet and Plate, Rod and Bar, Tube, Extruded Shapes, Forgings; *Steel:* Electric Welded Steel Tube.

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about 80 emery dressed, on a felt mop, for example, then work through 100 and 120 emery and so on to 200 or flour emery. After removing all scratches with flour emery, he recommends aluminum oxide such as diamantine be used to obtain a very high finish. In order to produce best possible color, one should finish with chromic oxide compound; but if one started with the latter compound instead of diamantine, the process is very slow. Speeds suggested for application of emery are 6000 to 8000 fpm, and for applying polishing compounds, 8000 to 10,000 fpm.

CLEANER chip removal and faster and keener grinding are provided by a lubricant now being produced by White & Bagley Co., Worcester, Mass., when used in connection with grinding and cutting operations. The water-soluble lubricant is easy to mix, and possesses unusual detergent properties. Called No. 1888, it also is said to give rust protection.

UNDER patent No. 2,017,071 and now available for licensing or sale, according to the United States Patent Office, Washington, is a method of securing adhesion of rubber to metal. It provides a high degree of adhesion between a relatively soft grade of rubber and ferrous metal without use of special expedients, such

as special rubber cement, or scoring of metal. The inventor states it requires some 400 psi to disrupt the bond, and that such disruption usually occurs in the layer itself rather than the bond; also it withstands severe flexing stresses.

CLEARING house space in which engineers may swap ideas, suggestions or new applications, and also present problems and proposals for solution in the field of air and hydraulic power is being provided in "Hyd-Air", new house organ inaugurated recently by Miller Motor Co. of Chicago. Any engineer or manufacturer concerned with this type of power is invited to submit ideas, test results or problems he is facing. These will be passed along to readers who in turn will be invited to submit solutions. Besides publishing the most pertinent solutions, the publication will send details of solutions to persons sending in the original problems.

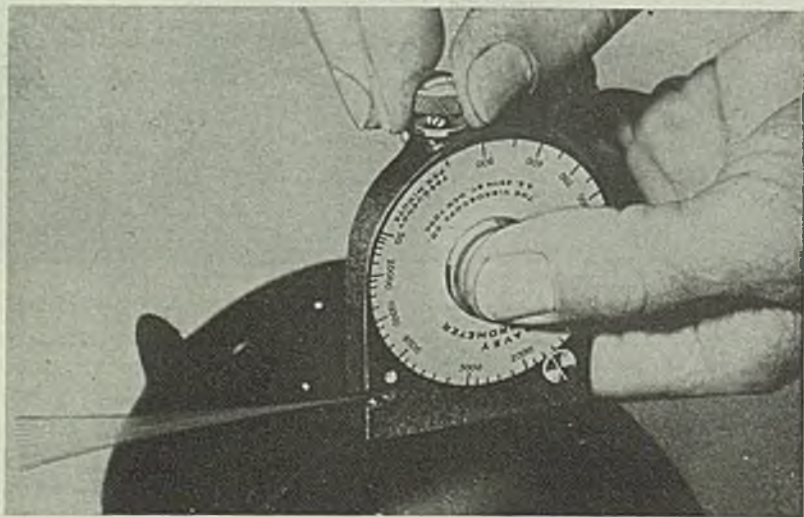
HOW seriously the combination of low ductility and high residual stress affects load-carrying capacity of welded joints connecting steel plates is the problem considered in detail in a bulletin entitled, "Residual Stresses in Welded Structures," prepared by Wilbur M. Wilson and Chao-Chien Hao, recently published by the Engineering Experiment Station of the University of Illinois at

Urbana, Ill. Publication includes an analysis of various theories of residual stress, and complete reports on tests to determine behavior of welded seams under loads, tests to determine behavior under static loads of plates with circular welded seams, and fatigue tests of plates with longitudinal butt welds.

COST of removing surface scale on steel forgings, which in many cases runs as high as \$12 per ton of work treated was cut to approximately 65 cents at the Salisbury Axle Division of Dana Corp., Fort Wayne, Ind., by using a new heat treating system developed by Lithium Co. of Newark, N. J. Actually performing the work of two departments, the system hinges on induction of a vapor form of the chemical element lithium into the furnace's heating chamber. Through atomic action, it is said, the lithium not only prevents formation of scale during annealing, but renders scaly crust formed in previous forging and heating of metal harmless for subsequent machining operations. Work emerges tempered by the annealing and ready for the machine shop after one operation. Only expense with the Lithium descaling furnace is actual cost of a small charge of lithium and the atmosphere gas—which totals 65 cents per ton of work treated at the rate of 4000 lb per hour.

LEVER type short cutting torch recently developed by Air Reduction Sales Co., New York, now permits boiler repairmen to work efficiently in confined spaces when removing worn fire tubes from boilers found in plants where low pressure process steam is used. In the retubing process, the 13-in. torch is used to "wash off" the flanging or beading on the tube and make three or four gouges on the inner surface. In the hands of a skilled worker, entire wall can be cut without injury to the tube sheet and without cutting through the outside of the tube and depositing slag.

WITH the usual carbide tipped work rest blade used on centerless grinders, chipping or other damage makes the blade useless for precision work, and the entire blade must be replaced even though most of the carbide is still in good condition. One way to get around this is to use a segmented blade such as the one currently produced by Scully-Jones & Co., Chicago. Damage to one or more of the segments does not require the blade to be scrapped, as it may be returned to the factory and the damaged segments replaced at low cost. Segment slots also are self-clearing, being designed so metal chips and grit are carried away quickly by circulation of coolant. Even softest metals are not marred by slots.



OPERATING on the tuning reed principle, vest-pocket size instrument shown here, manufactured by Vibroscope Co. in New York, measures machine vibrations accurately—between 450 to 50,000 cycles per minute—and compares amplitudes. When placed in contact with a machine, a steel reed is fed out from the body of the instrument, and when it comes into tune with machine vibrations, it snaps into sharp vibration, registering the vibration frequency directly on the dial. In cases where several disturbing frequencies are present, or vibrations are complex wave form, the development selects each of the frequencies separately and evaluates its comparative amplitude. Noise also is analyzed by plucking the reed and tuning it to correspond to the noise emanating from the machine



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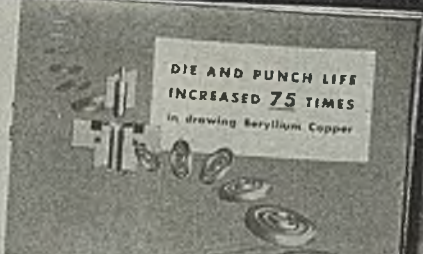
### BLANKING

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# INTRA-PLANT TRANSPORTATION

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Processing, warehousing and shipping of 2000 semi-finished and finished products in variety of sizes and shapes are handled quickly in plant of Pittsburgh concern

FOR the past 18 years, a fleet of 13 storage battery-powered platform trucks has facilitated the processing of many thousands of tons of materials each month at the Pittsburgh plant of Hubbard & Co. The company's 2000 different items of outside construction hardware for power and communication pole lines are handled by trucks with rated capacities ranging from 3000 to 6000 lb.

Many items, such as channels, plates, turnbuckle rods, anchor rods, are of sizes and shapes awkward to handle, Fig. 2.

Nuts, washers, pins, bolts, clamps, permit compact loads for in-plant handling and shipment. Various parts, in final movement either to box-car or motor truck for shipment, are contained in bundles, kegs, half-barrels, sacks, cases, crates or cartons. With but few exceptions all are handled by storage battery-powered trucks, in loads up to 7500 or 8000 lb.

Hand-trucking of minor loads, either in process or for shipment, is still resorted to. Incoming supplies of steel in bar, rod, plate or sheet, are handled by

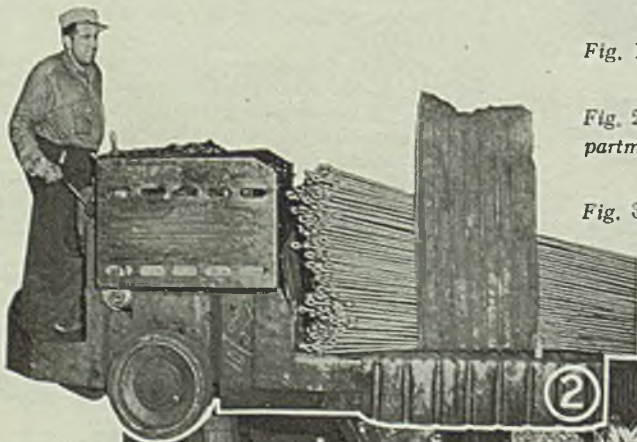
overhead cranes which unload and place in storage piles. Cranes are used also to move such material from storage to the first step in processing. Overhead cranes are also used to handle huge trays of material in the cleaning and galvanizing operations.

The Hubbard plant relies principally on pressed steel skids for assembling loads, Fig. 2 and 3. These, when fitted with removable side units, are transformed into skid-bins. When the tops (Please turn to Page 116)

Fig. 1—Load of angle irons weighing 3500 lb is removed after hot dip in galvanizing department

Fig. 2—In moving anchor rods from thread and forge room to galvanizing department, sidewalls of removable top of bin-skid act as restraining braces to keep load on platform

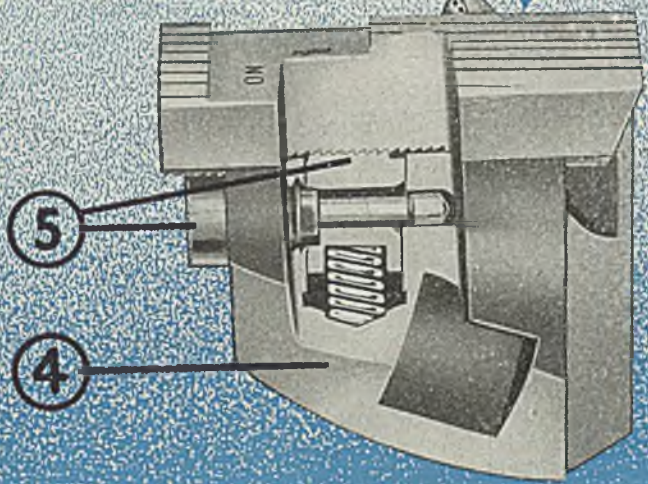
Fig. 3—Rods too long for truck platform are held in place by chain over end of load on platform



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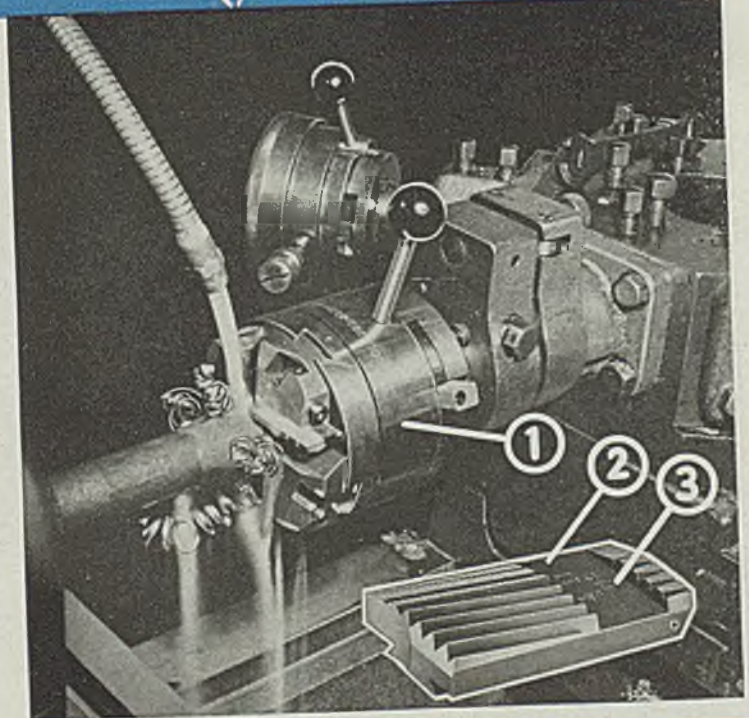


### THREAD QUALITY

1. The Die Heads are hardened and ground throughout. The body is not only ground, it is lapped on the face and in the dovetail slots. The bearing surfaces of the chaser holders are also ground and lapped into the body.
2. Jones & Lamson Ground Thread Tangent Chasers are guaranteed to hold lead correct to .001" per inch and to produce threads to Class III specifications.
3. The exact helix angle, in fact all the elements of an accurate thread are ground into the chasers after hardening. The possibility of poor quality threads and costly scrap, due to faulty chaser setting, is eliminated.

### ECONOMY

4. Jones & Lamson Tangent Chaser Die Heads are universal. Only one set of chaser holders is required for all right-hand threads, and only one set of holders is required for all left-hand threads within the rated capacity of the die head, regardless of pitch or diameter. Investment in chaser holders is reduced to a minimum. Change over and set up is speeded.
5. Chasers are easily and quickly set. Ratchet-teeth on the back of the chasers, corresponding to ratchet-teeth in the holders, provide definite locating points for resharpener, measuring and setting. The chasers are positively and quickly secured. A couple of turns of a single screw releases or secures them in the holders.



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COUPON

# Copper Brazing

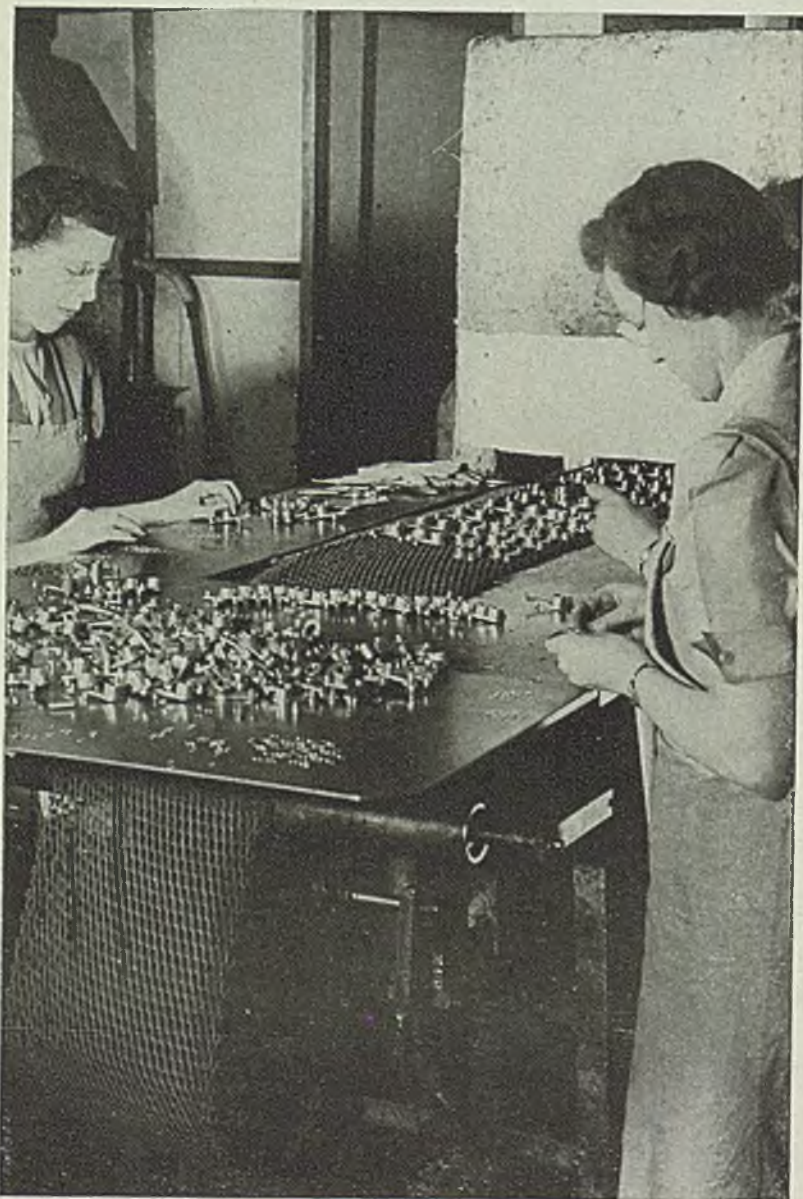
## INTRICATE PARTS

*Assembly-line techniques are used to join punch and screw machine products in brazing atmosphere in which propane is included*

MANY of the smaller parts of precision machines are so intricate that to produce them as single parts would be a most difficult and costly shop job. In the factory of National Cash Register Co. at Dayton, O., such parts are being manufactured by using a copper brazing process developed in the company's metallurgical laboratory.

Basic work on copper brazing was

done by General Electric Co., Schenectady, N. Y. By working in close cooperation with GE, National Cash Register's technical staff worked out an application of copper brazing to produce parts for cash registers. These parts are a combination of punch machine and screw machine products made into a single unit, that can later be heat treated and hardened.



On all carbonized work a close check must be kept on the atmosphere; otherwise decarbonization will result and the piece will not respond to the hardening process because it will have a soft exterior. The copper brazing process developed at Dayton uses a GE brazing furnace with its component part, a Drycolene atmosphere producer or generator.

Ten parts of air to one part of natural gas are fed into burners focused on a retort that is filled with charcoal. Product of the combustion of the air and natural gas mixture is carbon dioxide, nitrogen and water which comes out as a gas mixture, the water being vaporized. This gas mixture is retained in a chamber in which the burners are located. Gas is taken off at the top through a pipe that later assumes a coil form. The coil section runs through a water jacket that cools down the gas and condenses the water, which is then drained off through a water trap leaving a gas with a dew point of between 50 and 60° F.

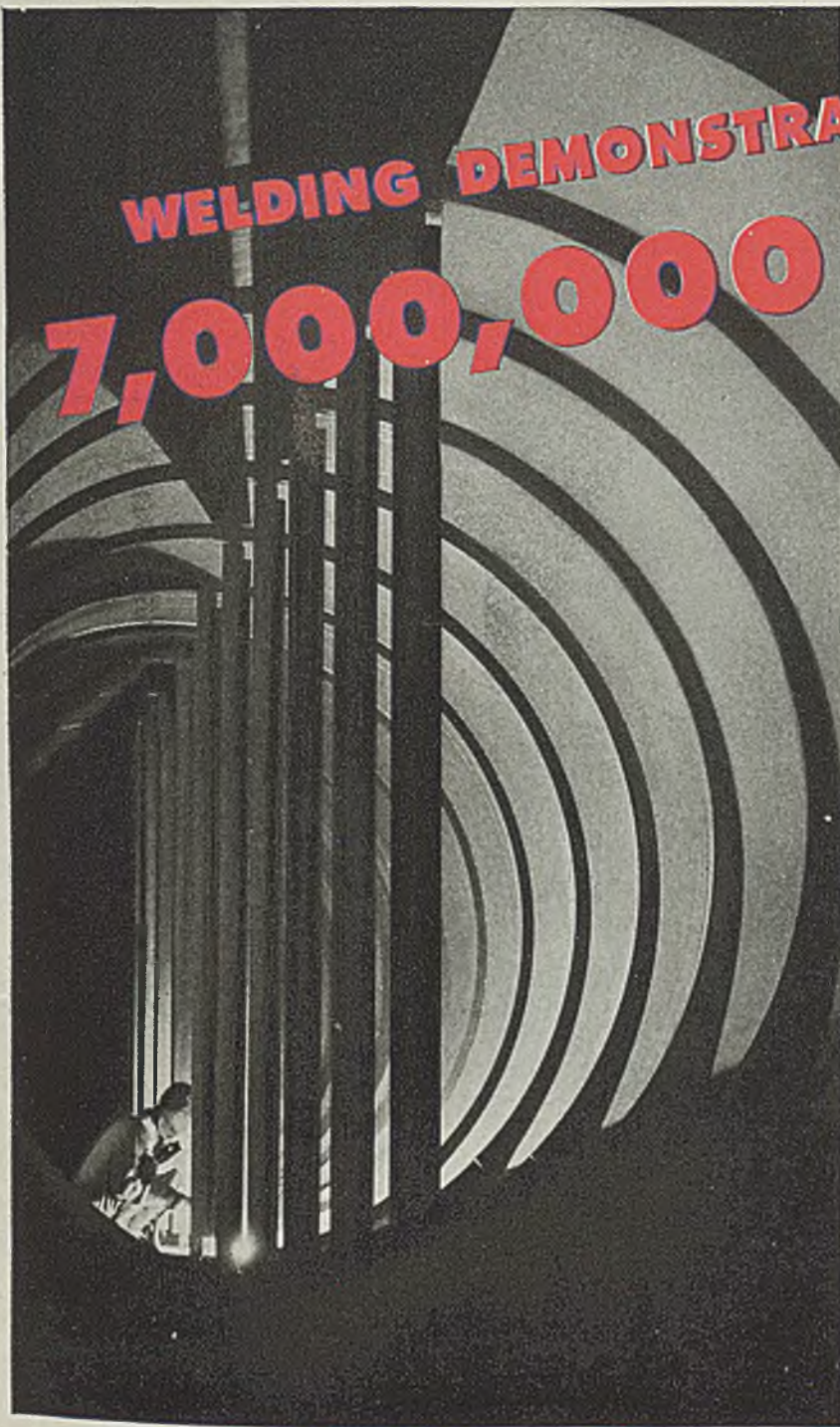
Enough gas is bled off so that the temperature of the retort remains constant at 1900° F. Bled off waste gas passes out into the air. Propane is added to the remaining gas. The proportion of propane added to the gas is 20 cu ft per hour of propane to 500 cu ft per hour of gas. This addition to the General Electric process was developed by the Dayton laboratory.

Gas with the propane added is then passed up through the charcoal-filled retort. There the charcoal combines with the carbon dioxide forming carbon monoxide; nitrogen and hydrogen are also present.

It was found that the propane broke down to give carbon and hydrogen. The carbon from the propane is used to supplement the charcoal in the retort. Without the addition of the propane the furnace could be run for only 8 hours after which it would have to be shut down to replenish charcoal in the retort. This replenishing process, including the time needed to remove the ash, took 3 hours. With the addition of propane to the gas mixture the furnace can run 60 hours. The success of this whole process depends on peaking the retort at 1900 to 2000° F.

The atmosphere produced in this way is much more positive with the propane added, and lower in carbon dioxide content. The ideal atmosphere for copper brazing would be zero carbon dioxide with a dew point of minus 50° F. This process produces an atmosphere

*Parts to be brazed are assembled and carried into furnace on conveyor belt. Copper is in form of wire ring with 0.002-in. press fit*



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of zero carbon dioxide with a dew point of minus 20° F. Variation of 30° F in dew point has no material effect on the work done in this atmosphere.

The atmosphere thus produced is piped from the retort to a furnace with open ends where it becomes the atmosphere in which the copper brazing is done. Brazing furnace has both ends open with doors which allow the opening to be adjusted. A continuous conveyor belt running through the furnace carries parts to be copper brazed. Furnace doors are adjusted so that the opening is just large enough to allow the conveyor belt to pass through with the parts on it.

Because of the two open ends a greater amount of atmosphere is needed in the furnace to allow for atmosphere es-

capement at either end. Thus, the furnace is filled with from 600 to 700 cu ft per hour of atmosphere whereas if the ends were closed possibly only 200 cu ft per hour would be sufficient. Thus an excess of atmosphere of between 400 and 500 cu ft per hour is needed to maintain sufficient atmosphere within the furnace chamber.

At each of the two openings, a pilot light keeps the escaping atmosphere burning. A hood located directly above the pilot light bleeds off the fumes caused by the burning atmosphere. Openings in the ends of the furnace are not large enough to cause the atmosphere inside the furnace to catch fire. Furnace operates at 2070° F, or 100° F above the melting point of the copper. Hydrogen in the atmosphere in the fur-

nace acts as a flux in the copper brazing.

The atmosphere is analyzed several times a day for carbon dioxide content, this being a positive check on the quality of the atmosphere. If inspection of the brazed parts indicates that there is something wrong, evidenced by faulty brazing, the atmosphere is given a complete analysis. This, however, is rarely necessary since the analysis for carbon dioxide is sufficient check.

Before putting parts through the brazing process they must be cleaned of grease and dirt and any scale that might be present. The atmosphere has cleansing properties and is efficient in reducing any oxide that might be present and also in burning off any dirt that might be on exposed sections of the parts to be brazed.

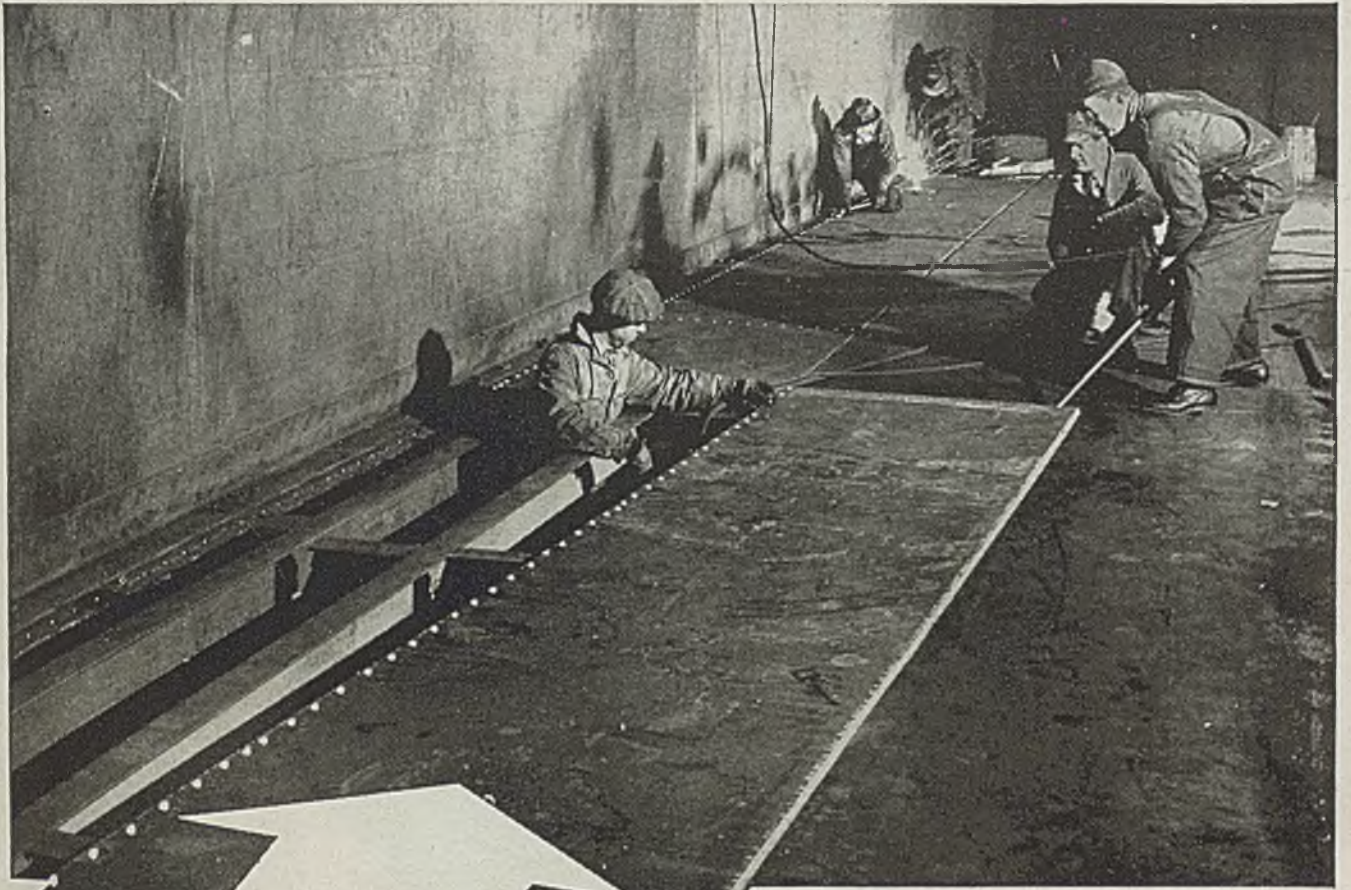
Some of the assembly jobs produced by this copper brazing process consist of two separate pieces, one of which has a hole into which a projecting part of the other fits. It is this joint that is to be brazed. In other instances one part, perhaps a spiral is brazed onto a flat section. In many of the jobs two or more parts that make up the assembly unit are sufficiently well joined that they are merely laid on the belt prior to brazing. In other instances it is necessary to fasten the two parts together with small clamps to hold them in place until the brazing process can be completely finished.

#### Copper In Wire Ring

Copper to be brazed onto the parts is generally in the form of a wire ring with 0.001 to 0.002-in. press fit. In instances where spirals, for example, are to be brazed onto a flat part, copper hairpins are hung on the spiral at intervals. Furnace heat melts these hairpins allowing the copper to flow down and run along the joint. It is not necessary to put the copper at the exact point where it is wanted, because when it melts it will flow to the joint and be sucked into it. By capillary attraction melted copper fills the cracks extending both upward and downward. However, copper will fill cracks that extend downward only when the under surface is open to allow capillary attraction to suck melted copper into the crack of the part being brazed.

The great advantage of copper brazing is that intricate parts for machines can be made in separate pieces and joined together at a tremendous saving in production costs. More than that, punch press parts may be combined with screw machine parts to form a unit which would be difficult if not impossible to produce otherwise.





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**FORGINGS  
FOR INDUSTRY**

## Steels for Naval Aircraft

(Continued from Page 99)

practice was acceptable provided properties of the final product were as specified. Advantages of wide latitude in procedures, without jeopardizing or sacrificing the necessary quality or properties of the steel, are obvious, and the flexibility in production thus permitted "paid-off" in many cases. It will be recalled, for instance, that toward the latter part of the war the demand for carbon steel and the relatively lower proportion of alloy steel consumed reversed the early position whereby electric-furnace capacity was tight, and put the premium on open-hearth steel. The corresponding, compensating transition from open-hearth aircraft alloy steel to electric furnace steel was permitted automatically, painlessly and expeditiously.

### War Experience Educational

Experience of war years was educational in additional ways. Necessity for making rapid decisions, on occasions, without benefit of detailed tests otherwise justified, and the need for acceptance at times of steel not completely up to specification values forced service tests on material the use of which could not properly have been permitted under other conditions. The applications in which this was done were not, of course, of such a nature as to jeopardize the safety of personnel or the success of important missions. Use of marginal material served the highly important, though incidental function of establishing the quality limits beyond which it was definitely desirable not to go. It resulted in establishing tolerances for the material having a maximum latitude. On the other hand, it also vividly brought home the importance, in some cases, of retaining the maximum quality of the product consistent with economy and facility of production.

The above and additional points not specifically mentioned will be reflected in the future procurement policy of the Bureau of Aeronautics, and will have its effect also in other programs such as research and development. It may be well, therefore, to discuss specifically some of the changes either already going into effect or anticipated in the relatively near future.

Of prime interest to steel producers and consumers alike is the anticipated possibility of deleting from steel specifications used by the Bureau of Aeronautics those famous two words "aircraft quality." The intent is not to imply in any way, by such deletion, that it is considered advisable to sacrifice unwarrantedly those special or high quality re-

quirements which the close strength tolerances and the peculiar nature of aircraft make necessary in steels for aircraft applications.

Such a modification of specifications would attempt to remove the ambiguity sometimes introduced through the use of the expression "aircraft quality." The term does not lend itself to precise definition through the medium of special quantitative tests in the specifications as do other properties such as tensile strength, grain size, hardness, etc. It is recognized that acceptance of inclusions in steel, which is one of the big factors in defining aircraft quality, must depend on two considerations. First, there must be a degree of cleanliness in the steel, practical to attain with good, high-grade steel making techniques, below which the steel may justly be called unnecessarily dirty, or otherwise defective, and therefore rejectable. It is not enough to maintain that the user can in some cases "get away with" a more marginal and dubious quality steel. The risk is unnecessary and therefore should not be taken. However, provided that the steel is at least of the above quality, certain inclusions and defects may be tolerated, depending on specific application and design for which the material

is intended, type, number and size of inclusions, and their distribution with respect to critical areas in the part under consideration.

Further a bar of steel may not reveal its true quality and suitability until it at least approaches its final configuration as a part, for example, after machining. It is apparent, therefore, that a true and realistic determination of aircraft quality involves inspection by any or all means, including magnetic particle inspection, at any stage in fabrication, for any type of defect or discontinuity which could prove harmful to the intended application. These thoughts will be reflected in future specifications. Obviously, in many cases no special quality steel will be necessary, particularly where the steel making quality has been high. In other cases, an extra-cost, special grade may be necessary. In all cases, requirements specified must be satisfied.

Further in the direction of end-product specification is the intended introduction of Jominy hardenability requirements in specifications being currently revised. Composition cannot be specified, for practical purposes, within sufficiently narrow ranges to assure maximum uniformity and efficiency in production, including processing such as heat-treatment and weld-



**BACK SAVER:** Among recent contributions to materials handling are two rack conveyors shown here being moved through an industrial plant by fork truck. According to the manufacturer, Rack Engineering Co., Pittsburgh, each 1-ton capacity rack is equipped with 12 roller bearing steel wheels with a swivel arrangement to permit easy movement about the plant floor. Never handled manually, trays hung on racks can be filled to capacities of 300 lb. Ceiling space between trays is varied to conform to height of material handled

ing; nor would such restrictive compositions be desirable, if only from the point of view of latitude and flexibility in procurement as already discussed above.

Introduction of the hardenability requirements is at least a step toward assurance of the desired uniformity and of suitability for the intended application. Looking ahead, it paves the way to the next stage at which it may be necessary to specify, in addition to hardenability, only type of steel, such as "chrome-nickel-moly," the carbon range (and possibly manganese) and maxima for sulphur and phosphorus. How the chromium, nickel and molybdenum vary may then be left to the discretion and convenience of the producer.

What additional controls may be relaxed as a still further step would be premature to discuss at this time. Continuing research may well demonstrate the need for introducing new requirements, not hitherto included, to control additional properties such as workability, weldability, notch sensitivity, oxidation resistance and others. For example, only the difficulty of analyzing for nitrogen precludes the omission of such a requirement in certain stainless steels. The importance of residual copper on rusting of carbon steel and the effect of excessive copper on weldability are recognized. Many other "controllable" variables, not now specified, could be cited.

Contemplated new specifications will reflect additional aids to uniformity, besides hardenability requirements. Heat-treatment requirements are being modified to indicate the range of hardness that may be permitted when specific hardness values are called out. Elongation values and reductions in area for given hardness levels will be defined, not only for greater uniformity, but also for insuring ductility above a given minimum. Decarburization limits will be specified for tubing. Elimination of excessive decarburization may well result in introduction of higher allowable design values for steel tubing used in normalized condition, and may thus permit use of thinner wall tubing for given stress conditions, leading to a weight saving on airplanes.

#### Identification of Material

Of no little significance during the war were the nontechnical subjects of packaging and marking. In many cases, particularly in the cases of the small users, these items were and still are passed over very lightly. In a global program, however, it is essential that the material arrive at its destination in a condition immediately usable and readily identified. Extensive studies were made of boxing and packaging to prevent rust, both in domestic and foreign climates and during transport, to permit

ready transportation, to prepare units neither too large for convenient handling nor too small for efficient utilization of transportation and stocking facilities. Identifying of the material is, of course, of vital importance. To this end it has been decided both in industrial and government circles that a permanent method of marking must be employed whenever possible. Otherwise as reported by one airplane manufacturer, the composition of as much as 90 per cent of the steel may have to be redetermined before it is considered safe and appropriate to use it. Such marking is best done by ink stamping in rows of recurring symbols and only where surface condition and size, as of bar and rod, preclude this practice will other methods of identification be permitted.

It would be amiss not to mention the important co-operative role played by industry in determining the contents of the aircraft steel specifications in the past, and, it is expected, in the future. At all times a close liaison is maintained with representatives of the aircraft and accessory builders and with the steel producers. Government participation in industrial committees, membership and activity in technical societies, frequent discussions with industry representatives and frequent visits from them, and distribution of government specifications throughout industry for comment while they are still in the formulative stage—all contribute to preparation of sound, practical specifications affording adequate assurance that exacting demands for aircraft parts will be satisfactorily, efficiently and expeditiously met.

The triple alloy steels developed during the war primarily to permit more extensive utilization of industrial scrap will be retained. Co-ordinated practice with industry in specifying compositions and other requirements will be followed insofar as is practicable. It is believed that a healthy condition of "give and take" has existed, of benefit to both industry and to the government, and this conditions should be continued. As far as the Bureau of Aeronautics is concerned, it welcomes at all times constructive comments and suggestions related to the specifications which it uses and will be pleased to discuss with qualified and interested personnel any phase of its specification program.

That the war demonstrated beyond question of a doubt the primary importance of research and development is now obvious. What, then, of the future of aircraft steels as reflected in current research, development and design programs? There can and will be an expanding field for steel in aircraft, particularly with the advent of new designs.

## NEW PRODUCTS

**Umbrella Plug**—Fits into center of hollow type rivets and furnishes a cap completely covering head of rivet. Available in aluminum, copper or plastic. Cherry Rivet Co., 231 Winston street, Los Angeles.

**Solvent Cleaner**—Solvent No. 2 removes grease, oil, carbon, grit and miscellaneous shop dirt from metal parts. Optimus Detergents Co., 178 Church street, Matawan, N. J.

**Bench Dispenser**—Code card inserted in dispenser with removable self-starter strip at top, exposing top end of each label to grasp instantly. Slot holds card. W. H. Brady Co., 2904-O East Lindwoode avenue, Milwaukee 11, Wis.

**Chrome Lock**—New type of gasketing supplied in four types, No. 8 and 16 without adhesive back, No. 8A and 16A with adhesive back. Products Research Co., 634 South Western avenue, Dept. A60, Los Angeles 5.

**Floor Cleaner**—No. 1F10, a heavy duty compound for use on cement, Terazzo or tile floors. Optimus Detergents Co., 178 Church street, Matawan, N. J.

**Plastic Slide Rule**—New 10 in. "Plastin" Frederick Post Co., Hamlin & Avondale avenues, Chicago.

**Waterproof Packing Liner Fabric**—Furnished in panels or prefabricated bags. Pro-

ductive Coatings Corp., 689 Main street, Belleville 9, N. J.

**Visco 77**—Lubricating oil-water emulsion breaker. Honan-Crane Corp., 636 Wabash avenue, Lebanon, Ind.

**Fan**—An 8-in. nonoscillating desk bracket pacemaker fan of one piece steel construction welded steel guard and brushless, two-pole induction type motor. Westinghouse Electric Corp., Pittsburgh 30.

**Test Kit**—Includes insulated heat units, infrared reflector lamps, heat unit adjustments, control switches, framework, shelf, flexible cords. Portable and extremely flexible. Miskella Infra-Red Co., East 73rd and Grand avenue, Cleveland 4.

**Case Numberer**—Utilizes impregnated plastic for wheels with aluminum for other major structural parts. Wm. A. Force & Co., Brooklyn 8, N. Y.

**Developing Tanks**—For developing, fixing and washing processes for photo and photocopy prints, Van Dyke or Silverprints, cloth reproductions and blue prints. Peck and Harvey, 5736 North Western avenue, Chicago 45.

**Ventilating Fan**—Available in 16 and 12-in. sizes, features dustproof motor for continuous operation without overheating, needs only occasional relubrication. Emerson Electric Mfg. Co., St. Louis, Mo.

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Aircraft construction, to be most efficient and to save every last vital ounce of weight, can suffer no exclusion of any materials—plastics, wood, glass, nonferrous alloys, light alloys, heavy alloys, steel, heat-resisting alloys—all are used to advantage and in applications of a structural nature as well as for specialized nonstructural purposes. The degree of development and effort expanded therein is important in determining which material will be used in increasing quantities. Thus, development and tests are underway with light alloys to replace steel landing gear parts. Also, development and tests are underway to replace, in certain cases, aluminum alloy structures with composite steel and aluminum assemblies.

The Bureau of Aeronautics is investigating time-temperature transformations leading to steel forgings having ultimate tensile strengths upward of 250,000 psi, with ductility and notch-sensitivity not lower than our present materials heat-treated to somewhat less than 200,000 psi. There is plenty of room, however, for additional activity by producers in this field, either individually or by co-ordinated action, as through the medium of the American Iron and Steel Institute.

The Bureau of Aeronautics is just completing an exhaustive study of stabilized 18-8 stainless steel over wide carbon, titanium and columbium ranges. This study may lead to significant conservation, in times of need at least, of the critical element columbium, which is playing such an important role in high-temperature alloys for jets and turbines. Stress-corrosion tests at elevated temperatures, in corrosive media encountered in service, such as exhaust gases, will serve to correlate laboratory tests with simulated service tests. Work will be continued in an attempt to understand that elusive quality so glibly referred to as "ductility," and to define its functions and characteristics with respect to workability and to fracture, particularly under multi-axial stresses.

#### Other Conditions Considered

Notch-sensitivity, impact, resistance to rapidly applied stresses, ballistic properties and other related items, not only under normal atmospheric temperature conditions but also at very low and very high temperatures, will be considered. Fatigue and endurance studies, and the evaluation of damage prior to failure, are being undertaken. Foundry investiga-

tions also will be conducted, for it is believed the substitution of castings for forgings, as an example, will become of increasing interest and importance.

Fabrication methods, notably welding, must be investigated further, and the significance of the steel melting practice, such as aluminum additions, to the weldability of the steel has received insufficient attention in the past.

Radioactive materials and radioactivity will not be overlooked. It is recognized, for example, that the use of these materials as "tracers" may yield valuable information concerning basic metallurgical phenomena and the structure of alloys.

Last, but by no means least, is the entire field of high-temperature metallurgy, with its alloy development work, its fabrication techniques, its metallography studies, its testing and evaluation, and even the related inspection methods, such as supersonics. The above list is not intended to be complete. The Bureau of Aeronautics—and this is true for other aircraft groups also—is working on or interested in a much wider range of subjects, both in government laboratories and through the medium of contracts with qualified private laboratories, institutions, and universities.

## Intra-Plant Transportation

*(Concluded from Page 106)*

are placed on their sides on the skids, they facilitate the building of firm unit loads of the rods and metal pole lengths that are so commonly used in Hubbard's hardware.

Side walls of the bin act as restraining braces to prevent shifting or spilling of the load. In case some of the lengths of steel bars or tubes are too long for the platforms of the electric trucks, Hubbard "splits" the load between two power trucks, one truck backing, the other going forward.

The high-lift trucks are used in the forge shop to change various size dies weighing up to thousands of pounds. Incoming dies are placed on the forward end of the truck's platform, while the old dies are pushed from position at the end of the platform onto the platform of another truck positioned to receive them. This second truck then transports the replaced dies to storage.

While the rated capacities of the high-lift trucks range from 3000 to 6000 lb, capacities of the low-lift trucks are from 4000 to 6000 lb. Overloading is quite common. Despite this, maintenance costs are said to be lower than they were prior to 1928 when the company was not using electric trucks and storage battery power.

According to John F. Connolly, superintendent at the Hubbard plant, move-

ment and warehousing of material is accelerated and warehouse space conserved, while heavier loads are handled and are brought from one end of the plant to the other in faster time. The average length of run at the plant is approximately 400 ft, with the longest uninterrupted run about 800 ft.

Five departments are served by the electric trucks—rough stores and press department; hot mill and forge; thread room, galvanizing and warehouse. As stated previously, all but the heaviest incoming material is handled by electric trucks from box-cars and motor trucks, including the pigs of spelter used in galvanizing. Pigs are manually loaded on steel skids in the cars. Truck moves into the box-car and takes the loaded skid away, having positioned another empty skid to be loaded.

A load of pig spelter runs as high as 8300 lb. Average weight of a load of anchor rods is about 5600 lb. Thirty to forty boxes, weighing about 70 lb each, are placed by hand on the platform of the truck, as are other items. Hubbard has not as yet adopted palletizing, either in warehousing or shipping.

Nineteen batteries are alternated between the 13 trucks. With several always in reserve these batteries are charged by automatic equipment. The trucks at present work a single shift, except those in galvanizing, which are on double shift. Battery change is accomplished by means

of an overhead electric hoist, located in the center of the thread room, adjacent to an entrance to the galvanizing department.

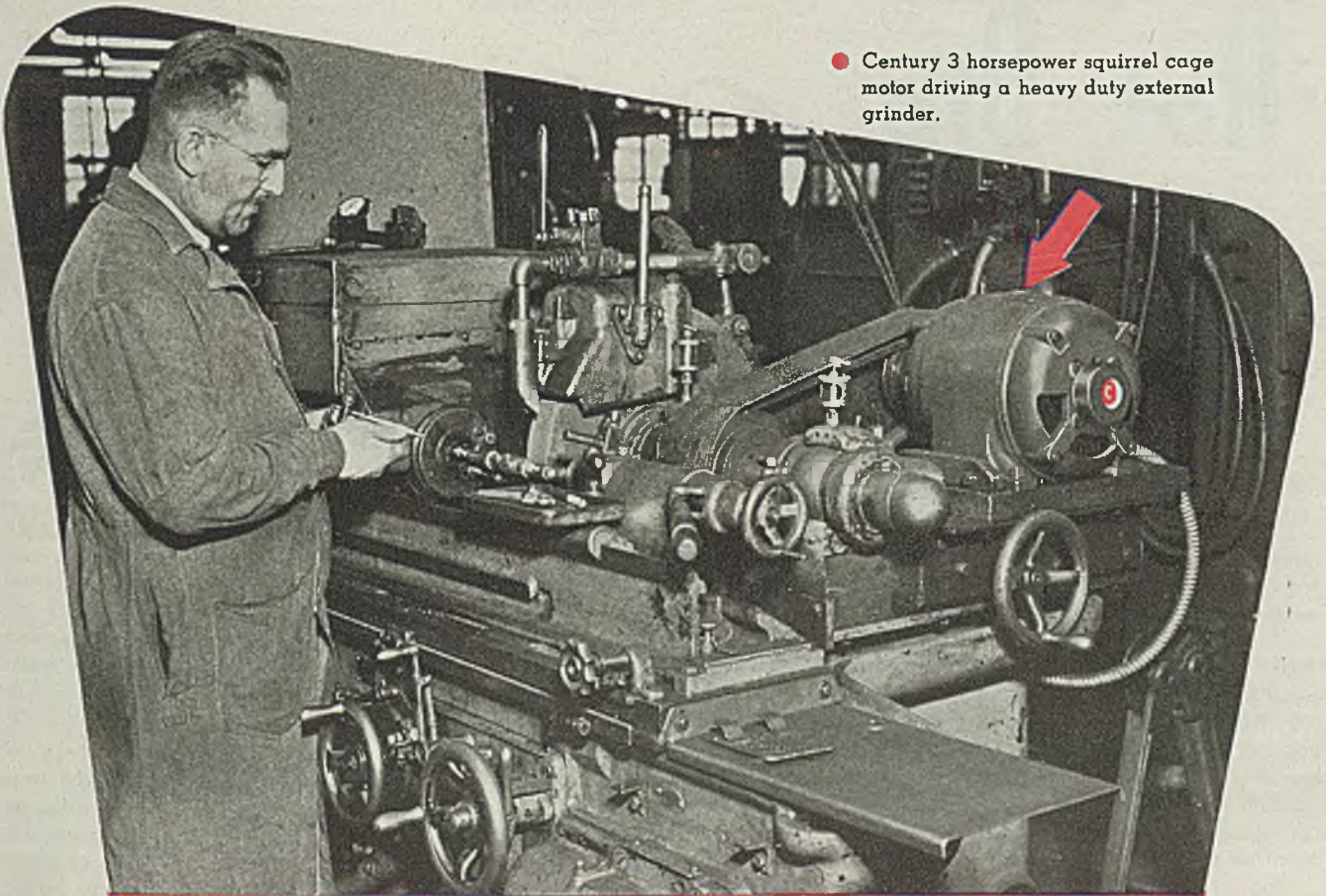
When a change is made the truck operator secures a fresh battery from the charging section bringing it on his truck to the changing area. Old battery is removed and the new one installed in approximately 10 min. Batteries on the other trucks are changed by the night electrician so that no "down time" is recorded against the trucks.

Greasing and inspection is done once a week by the night crew, which also makes minor repairs on the trucks. It is reported that all batteries provide service well beyond what they had expected, despite the heavy use and consistent overloading of the trucks.

Unique design features of molded products being used in new circuit breaker are revealed by Chemical Department, General Electric Co., Pittsfield, Mass. Designed to eliminate use of inserts, the main base, contact arm and tripshaft are molded by transfer molding process in black phenolic material.

GE plastics engineers state molding was accomplished without loose wedges or cross pins even though numerous cross-holes and small projections were included.

● Century 3 horsepower squirrel cage motor driving a heavy duty external grinder.



Century Motors'

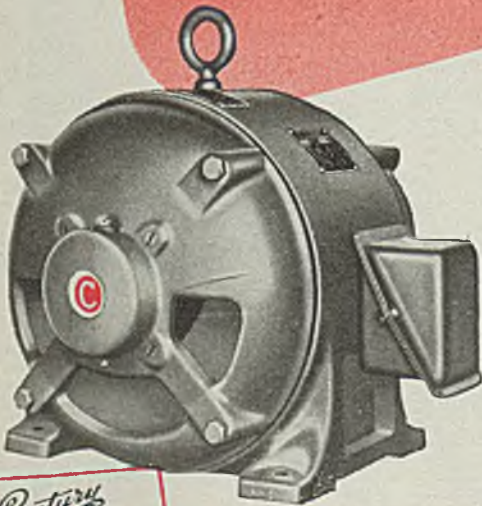
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**A**ccurate mechanical and electrical balance gives Century motors the smooth operation necessary to keep vibration to a minimum — to help maintain all the accuracy built into your machine tools.

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They are built in a wide range of types and sizes from 1/6 to 400 horsepower to meet nearly any electric power requirement. Specify Century on all your electrically powered equipment.



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497

# Hot-Dip

# Galvanizing Practice

By WILLIAM H. SPOWERS JR.  
President  
Spowers Research Laboratories Inc.  
New York

LATE development such as kettle settings, neutral fluxing, zinc flow control, etc., have brought tight bonding under complete control. This question is of particular interest to the wire industry and, hence, the control of wire coatings will be reviewed briefly.

1. All fence wire stock should be ordered *fully silicon killed*. This is one of the most important items to be remembered in obtaining tight bond. No aluminum should be used at the open hearth. This demand will probably

meet with some resistance from the open-hearth department, but if the desired result is to be obtained it must be insisted upon. The day is past, in the author's opinion, when any old stock, which cannot be used elsewhere, can be shipped to the galvanizer. Defective stock, such as "slivered" wire, must no longer be accepted by the galvanizing department.

2. Perfect control should be had at all times over the acid. The strength should be constant and regulated according to

the speed and size of the wire. Careful readings should be made for iron content of the acid which should be dumped when the iron reaches the specified percentage. This equipment should not be heated with live steam as this will unduly dilute the acid. Coils should be used to avoid releasing the steam in the acid.

3. The water wash should be complete. This may be effected either by simple immersion or by pipe quenching if space is limited. Upon the completeness of this operation depends the effectiveness of the fluxing operation. This tub may also be heated to maintain uniformity of temperature throughout the technique. The water should be as free of iron as possible and slowly flowing.

4. The flux tank should contain a solution of No. 20 neutral flux, the degree Baume of which should be adjusted so that the desired bath surface condition prevails. If the proper wash is maintained, this solution need not be renewed for long periods of time, but a check should be made at intervals on its iron content.

5. Proper bath surface conditions should prevail so that perfectly clean wire comes in contact with perfectly clean zinc at the entrance. Control of the Baume of the No. 20 flux bath will accomplish this.

6. The wire *must* be galvanized in pure prime western spelter free from

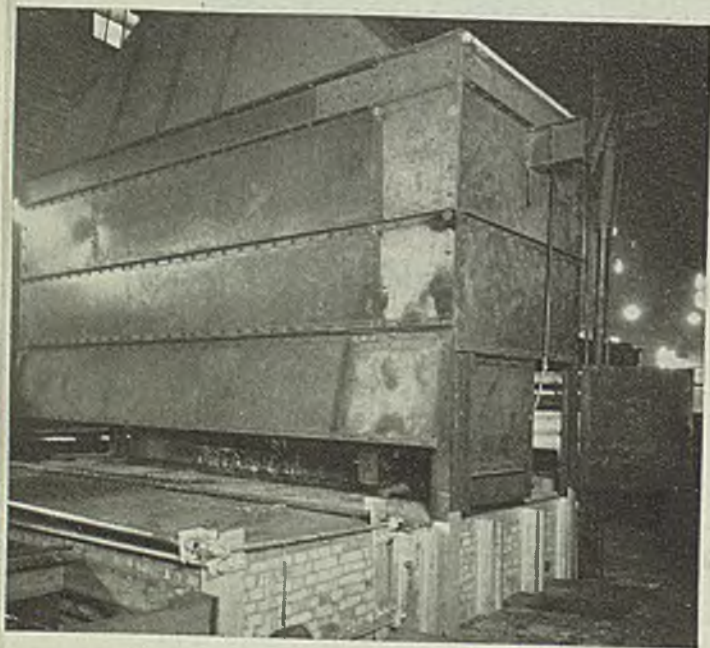
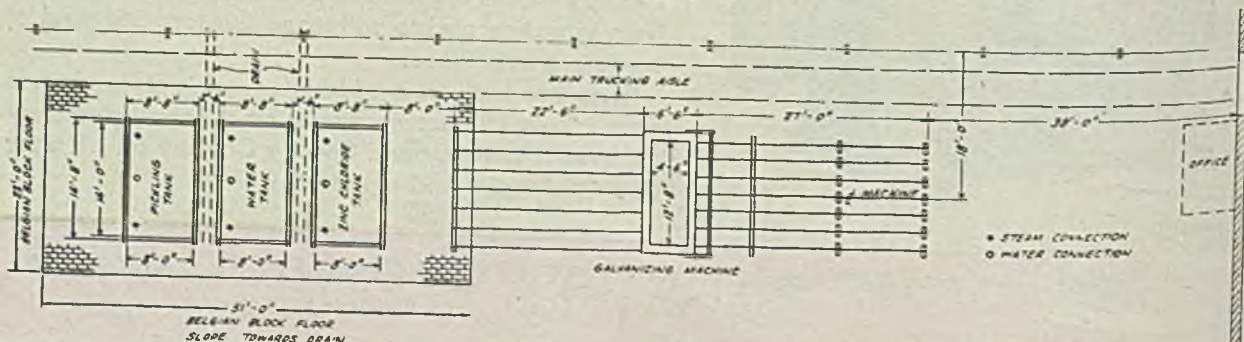


Fig. 38 (left) — Galvanizing unit used for zinc coating chain Link fabric

Fig. 39 (below) — Layout of galvanizing unit employed for zinc coating chain link fabric





**THE SECRETARY OF THE NAVY**  
WASHINGTON

The Secretary of the Navy takes pleasure  
in commending

COMMANDER W. H. SPWERS  
UNITED STATES NAVAL RESERVE

for service as set forth in the following

**CITATION:**

"For outstanding performance of duty while serving as Head of the Quality Control Conservation and Operational Analysis Section in the Bureau of Ships from August 1941, to September 1945. By his part in designing, building and operating new galvanizing shops at five Navy Yards and by giving direction to his Section's conservation and quality control groups, Commander Spowers was instrumental in accomplishing the production of the highest quality galvanizing at greatly lowered cost, thereby effecting a considerable monetary saving to the Government. His ingenuity and professional ability contributed materially to the successful prosecution of the war and upheld the highest traditions of the United States Naval Service."

A copy of this citation has been made a part of Commander Spowers' official record and he is hereby authorized to wear the Commendation Ribbon.

*James Forrestal*

Secretary of the Navy

deep kettle at about 850° F 6-ft immersion, 4 revolutions of a 22-in. block and carbon-wiped full specifications can be met.

Poultry netting and hardware cloth should be pickled in sulphuric acid containing a good substantial inhibitor. These materials are cleaned in rolls which are shifted by overhead rails from pickle to water to flux to feed rack.

Of great importance is the maintenance of a full head of volatile flux on the bath surface. This volatile bath cover is

**TABLE VI—ANALYSES OF TELEPHONE WIRE**

Element	Heat No. 1,		Heat No. 2,	
	%		%	
Carbon .....	0.05		0.04	
Sulphur .....	0.028		0.027	
Phosphorus .....	0.075		0.076	
Manganese .....	0.14		0.08	
Tin .....	0.06		none	
Copper .....	0.23		0.26	

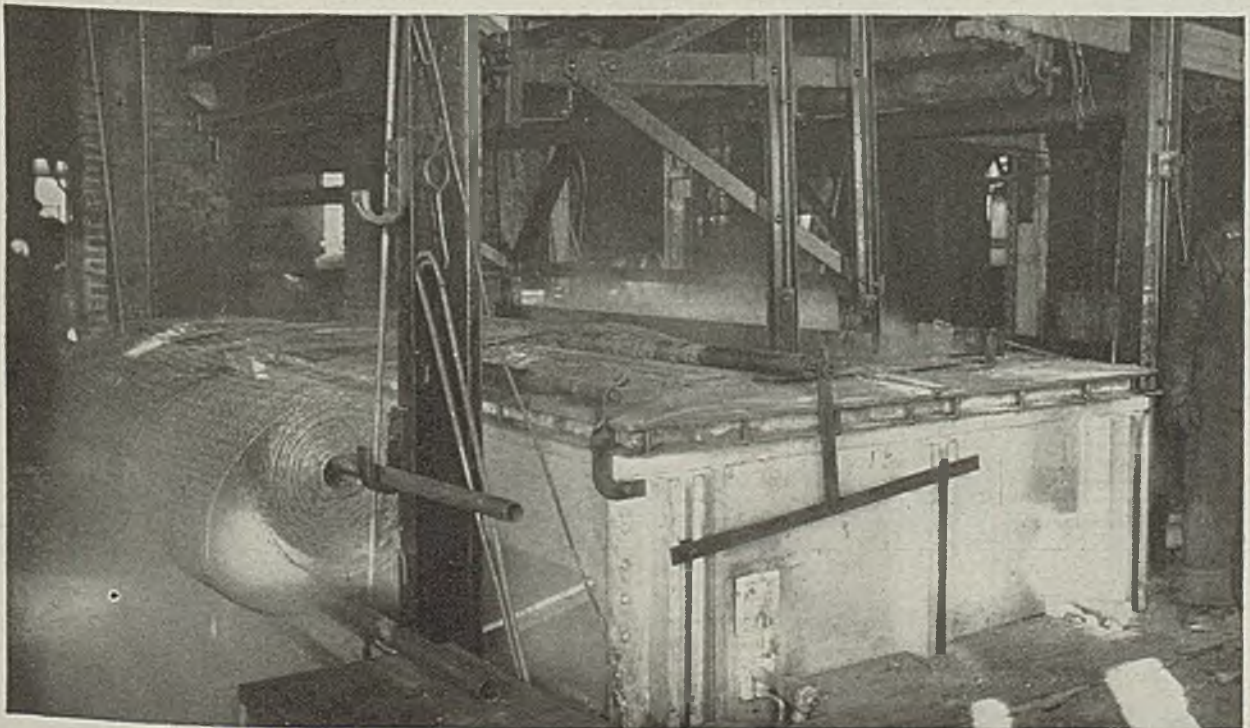
controlled by the Baume reading of the No. 20 neutral flux wash tank. In galvanizing both poultry netting and hardware cloth the material enters the bath rather wet and the volatile cover acts as a preheating and drying agent and prevents the burning of the liquid flux wash which would be detrimentally affected were it to enter the bare metal.

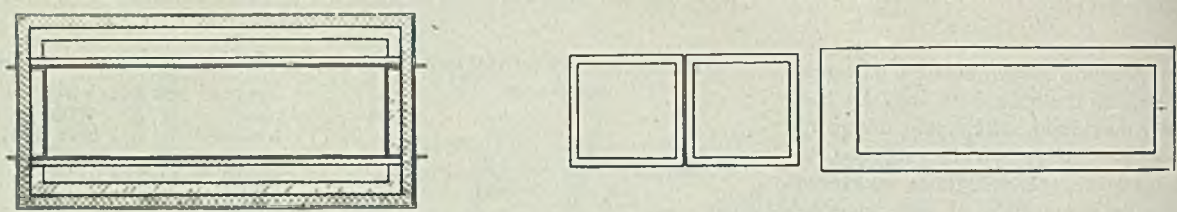
Important also is the type sinker to be used. Because of the light mesh in thinner gages of these fabrics, all strains must be minimized as much as possible, lest the mesh become distorted. Any such distortion makes necessary the guiding by hand of the fabric as it reels after galvanizing. To prevent any distortion a revolving sinker is used with no rotating bearings below the surface of the metal. Further to aid the freedom of travel, this sinker roll is power driven.

On the outgo side of the kettle the surface of the metal is covered with saturated granular carbon. Charcoal should not be used as it chars too easily and requires constant wetting to prevent too rapid deterioration. This carbon is maintained at a depth determined by the gage of the wire, mesh and weight of coat desired.

The fabric is withdrawn from the

Fig. 40 (below)—Installation for galvanizing both poultry netting and hardware cloth





zinc vertically and thence to the take-up frames. The take-up frames should have a speed regulator attachment so that the material to be coated passes through the zinc at a given speed which will not increase as the roll grows in size.

Again, the temperature of the zinc, length of immersion and speed of travel determines the weight of coat. But in the case of woven fabric the control of the gain in zinc is of utmost importance because of the fact that the nature of the weave lends itself to heavy gains.

Therefore, care must be taken in the selection of the particular brands of zinc used. Only those brands known by experience to be of extreme fluidity should be used in this operation. Because of the cross weave in hardware cloth, which

is drawn through the zinc at right angles, this work will pick up excess gain at the weave junction if heavy spelter is used. Even the lightest and most fluid of zincs must be generously metal fluxed in order that the finer meshes may be coated without clogging.

In this type of galvanizing the high-fired type of setting has been of great assistance in maintaining the highest fluidity in the galvanizing area of the kettle. Entire freedom from circulating dross is essential in this operation.

The necessity for proper installation design and capacity for this type of work is illustrated by the following case. A western house requested assistance in obtaining a smoother result in the zinc coating of wire cloth. Samples were ex-

tremely rough and full of dross and it was evident that the kettle conditions were not correct. Correspondence anent dross losses brought out the fact that the company never had made any dross and, consequently, had never removed any from the kettle; in spite of the fact that kettle life averaged only 4 to 6 months.

The installation was found to consist of tiny pans 7 ft long, 20 in. wide and a round bottom 10 in. deep at the center. To make matters worse it was fired with an open oil burner directly on the bottom. So great was the agitation of the bath that the dross was being carried out on the work. Although an extreme case of poor firing, this shows what happens in any installation of low or under-fired type.

(To be continued)

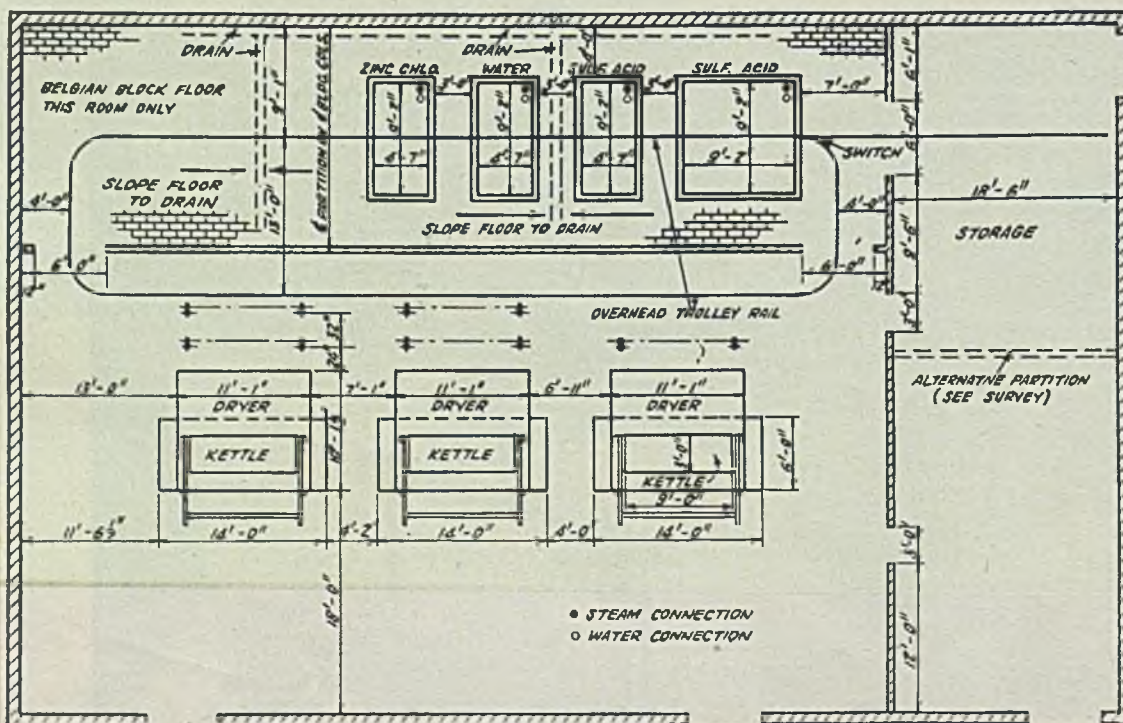
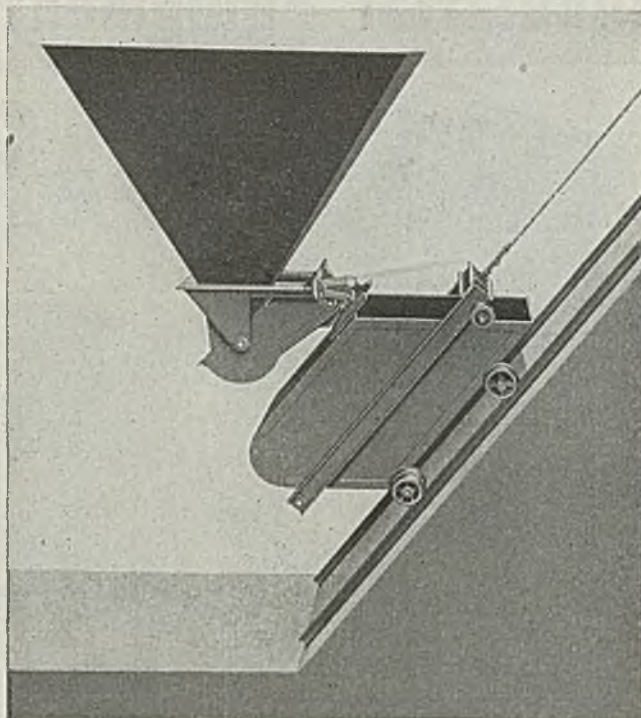


Fig. 41 (above) — Layout of a plant for straight wire galvanizing

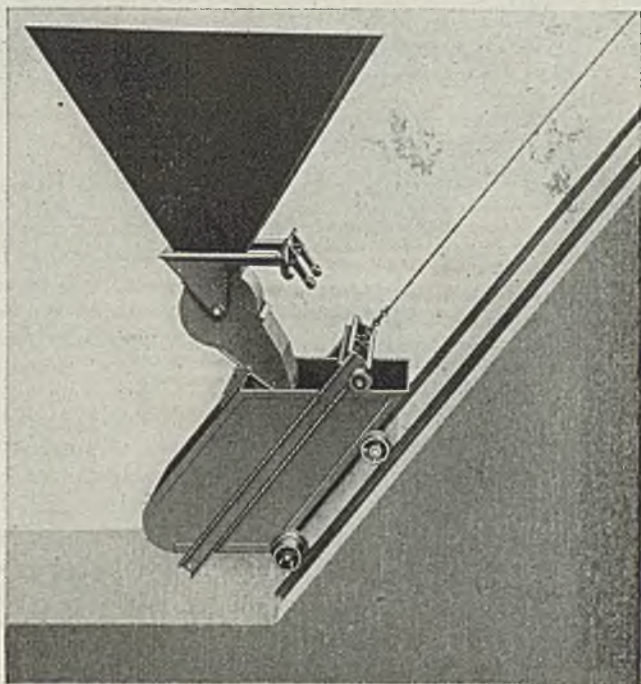
Fig. 42 (left) — Layout of a 3-kettle galvanizing plant for zinc coating poultry netting and hardware cloth

**quiet—  
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non-spilling**



## **PLUG FEED SKIP HOIST LOADING GATES**

● Conceived and perfected by Bartlett-Snow engineers—originators of the first fully-automatic Skip Hoist—this Plug Feed type loading gate is of sturdy, ingenious design and dependable construction. It operates without friction and consequently encounters little wear. There is no banging or other noise—no jar—no spillage even when the skip bucket is traveling at quite high speeds, and no counterweights or electrical equipment in the pit to require adjustment or other maintenance. Send for Bulletin No. 92. It gives complete details including dimensions of the 11 standard sizes, and other information of much interest to engineers and operating men.



**THE C. O. BARTLETT & SNOW CO.**

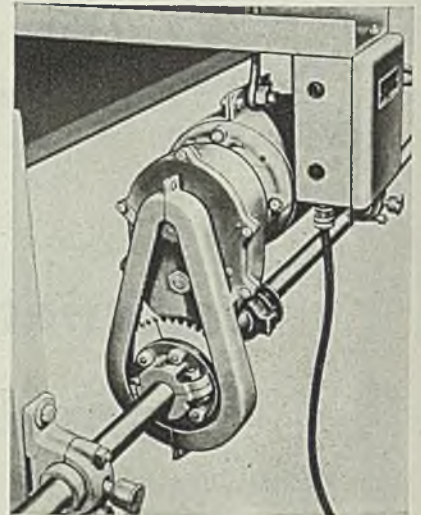
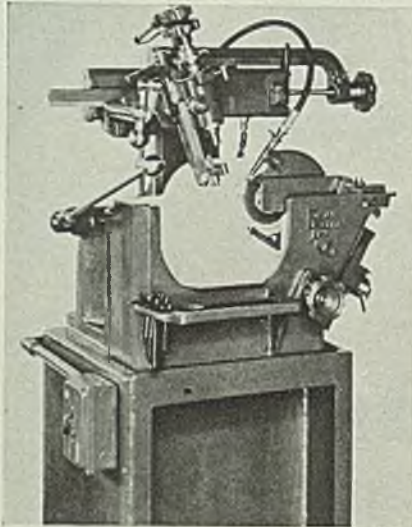
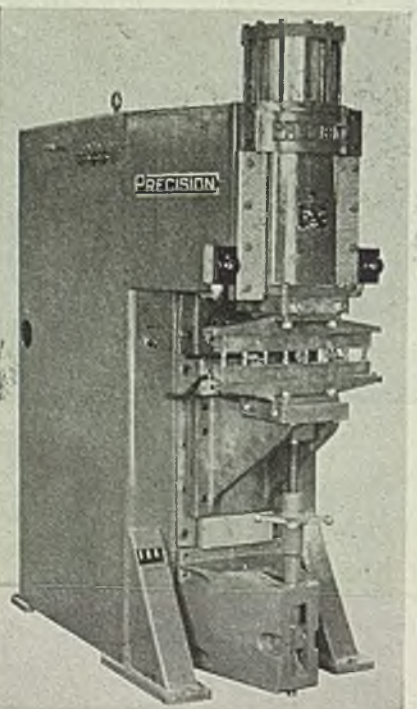
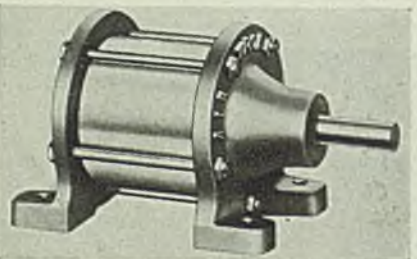
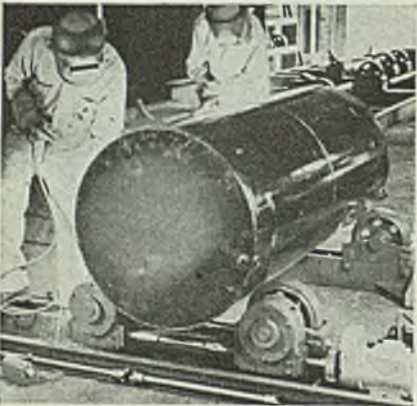
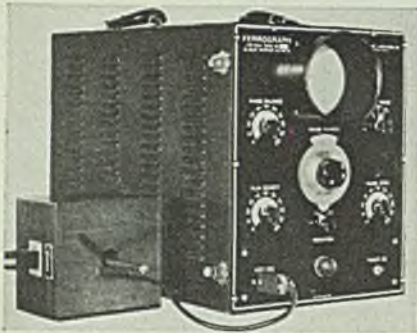
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November 4, 1948

# Industrial Equipment



## Composition Tester

Comparing ferrous materials as to chemical analysis and heat treatment, the Ferrograph, top left column, was developed recently by Allen B. DuMont Laboratories Inc., Passaic, N. J. The instrument, based on correlation between magnetic and metallurgical properties makes possible the determination of composition and condition of materials by magnetic testing, with a cathode-ray tube as the instantaneous indicator.

Steel 11/4/46; Item No. 9850

## Turning Rolls

Used for manual or automatic welding of tanks or other cylindrical shapes, these turning rolls powered by a ½-hp motor consist of two independently mounted separate units. One is the power unit and the other is an idler. The power unit is built with a variable speed drive to give perfect welding speeds for any type of material. Made by Reed Engineering Co., Webb City, Mo., the unit second from top, has rubber tired wheels as standard equipment.

Steel 11/4/46; Item No. 9909

## Air Control Cylinder

Designed to expedite material holding operations for drilling, reaming, tapping, milling, grinding, injection and ejection, this air control cylinder, third in column at left, manufactured by Air-Trol, 2651 West Lake street, Chicago 12, has a power factor from 1.76 times air line pressure. Features are true-bore cylinders, nonrusting cylinder heads, graphite impregnated oilless bronze ram bushings and sizes ranging from 1½-in. up. Adaptable to single and multiple setups,

a foot control is offered as extra equipment where needed.

Steel 11/4/46; Item No. 9910

## Vertical Welder

Equipped for spot or projection welding, this new type AVA air vertical action welder is made in four standard sizes covering range from 30 to 500 kva and pressure to a maximum of 18,000 lb. Manufactured by Precision Welder and Machine Co., Cincinnati, the machine, bottom left, is constructed and styled in machine tool manner including unit assemblies, simplified installation and complete accessibility of the interior.

Steel 11/4/46; Item No. 9906

## Flute Grinder

Positive mechanical controls necessary for accurate speedy sharpening of both spiral points and straight flutes of taps and other fluted tools are provided by new machine, center above, manufactured by Edward Blake Co., 634 Commonwealth avenue, Newton Centre 59, Mass. The standard machine can handle right and left-hand taps from the smallest up to ¾-in. in diameter. It also permits grinding 2, 3 and 4-flute taps. Simple index plates are furnished for taps having greater number of flutes.

Steel 11/4/46; Item No. 9907

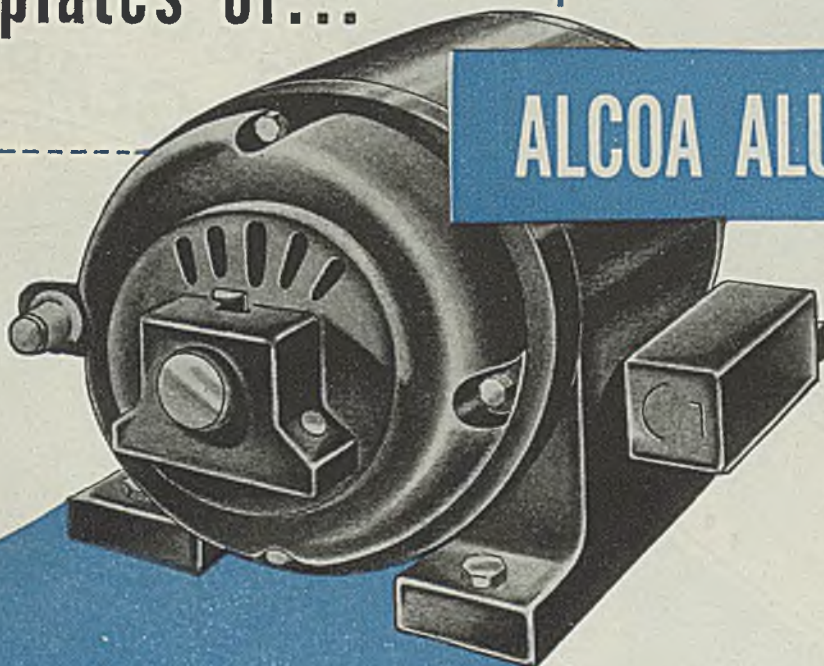
## Universal Mounting

Electric power travel for hand traveled overhead cranes is now available in a universal mounting, directly above, which makes the Travelator applicable to any type overhead crane, both single and double girder. Designed by North-

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 123.)

Make those motor  
end plates of...

ALCOA ALUMINUM



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permanent-mold or die castings where production is high**

Consider what Alcoa Aluminum end plate castings will do for your motor production—permanent-mold and die castings for volume production, sand castings where quantities of any one model are small.

Little excess metal need be left on Alcoa permanent-mold and die castings, since dimensions can be held to close limits. Machining time and costs are consequently much less. Surfaces are smooth, taking a fine finish with a minimum of preparation.

In addition, you reduce the over-all weight of electric motors by making their end plates of aluminum. A four-pound saving on a  $\frac{1}{3}$  H.P. motor is typical. This means easier handling all along the line, and lower shipping costs.

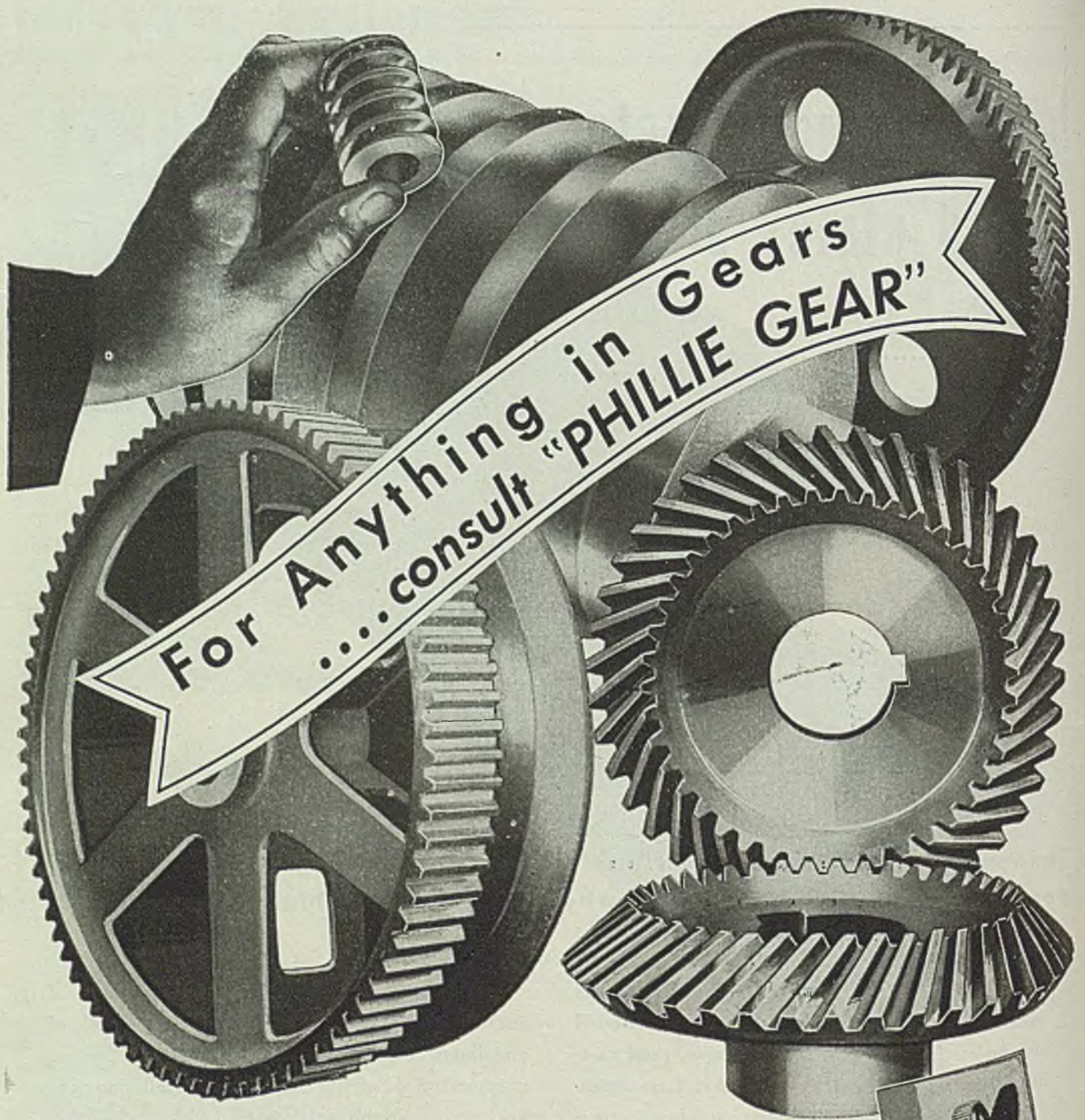
Check on the use of Alcoa Aluminum by calling the nearby Alcoa office.

Or write ALUMINUM COMPANY OF AMERICA, 2112 Gulf Building, Pittsburgh 19, Pennsylvania.

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Industrial Gears and Speed Reducers  
LimiTorque Valve Controls

ern Engineering Works, 2615 Atwater street, Detroit 7, the power unit is held in a steel mounting band which is connected to the mounting bracket. This mounting band may be given any position about the periphery of the motor. *Steel 11/4/46; Item No. 9905*

**Ball Vise**

Designed for holding work at any desired angle, with no dead motion, the universal ball vise, manufactured by Reypo Corp., 9900 Lincoln boulevard, Los Angeles 45, facilitates operations such as filing, drilling, machining, grind-



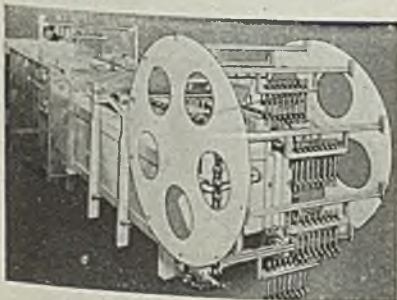
ing, assembling, and numerous other operations requiring work to be presented at different angles. Body of vise is entirely closed, so dust and chips cannot enter.

Instant changes in work position are made possible by lever lock and release. Parallel ground surfaces of hardened anvil and jaws aid in compound angle setting. Jaws of vise are interchangeable and reversible.

*Steel 11/4/46; Item No. 9775*

**Salt Bath Furnace**

Continuous salt bath furnace with automatic quenching mechanism for cyanide hardening is announced by Bellevue Industrial Furnace Co., 2971 Bellevue, Detroit 7. Ferris-wheel type auto-



matic loader, located at charging end of furnace is equipped with metal pockets for holding the specially designed fixtures carrying this particular part. Loading pockets are spaced and syn-

chronized to allow fixture holding parts to be placed in slots provided on continuous chain. Chain travels entire length of machine which includes furnace and quench tank. As the fixture is placed on the chain, the work is carried through the salt and entire length of furnace. Reaching the discharge end of furnace, a rotary arm picks up the fixture containing the work and drops it into the quench tank. Quenching operation is completed in four seconds, but speed may be changed to meet metallurgical requirements. Variable control drive is supplied to permit changing of time cycle for parts going through the furnace.

*Steel 11/4/46; Item No. 9690*

**Vibration Insulators**

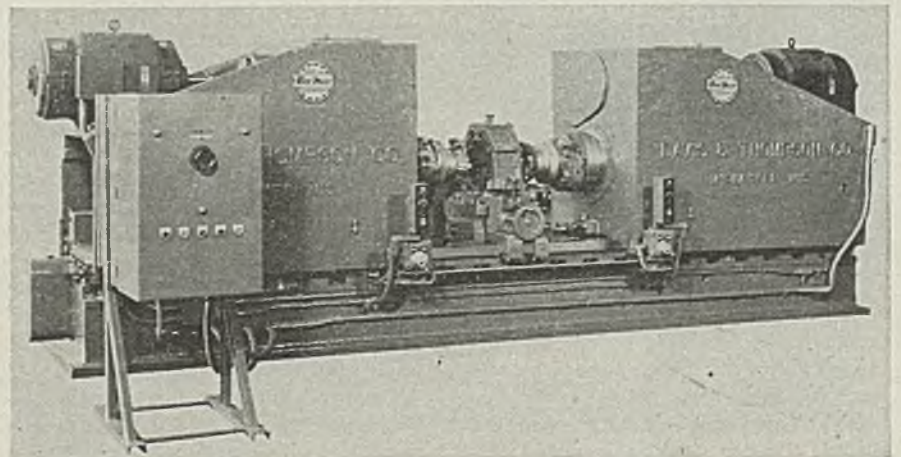
Three new Vibro-Insulators, devices of rubber and metal to cushion industrial and manufacturers original equipment of all types, are being manufactured by B. F. Goodrich Co., Akron, O. Listed as No. 130, 133, and 144, they may be used as feet or bumpers for office equipment, portable machinery, tables, blowers, fans, pumps, etc. Rubber is of 45 durometer hardness.

The insulators are capable of carrying maximum loads of 132, 180 and 60 lb with a maximum deflection of  $\frac{1}{8}$ ,  $\frac{5}{32}$  and  $\frac{1}{8}$ -in. with minimum disturbing frequency of 1200, 1200 and 1350 per minute, respectively.

*Steel 11/4/46; Item No. 9677*

**Two-Head Boring Machine**

Boring, facing, chamfering and counter-boring operations are performed on electric motor frames in one set up of the 2W way type two-head boring machine developed by Davis & Thompson Co., 6411 West Burnham street, Milwaukee 14. Electrically or manually controlled hydraulic power actuates the feed cycle of the machine, spindles of which are operated by two 15-hp direct current



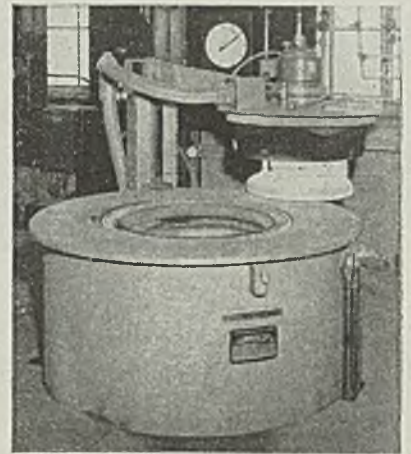
variable speed motors, one at each end of machine.

Spindle speeds may be varied from 80 to 320 rpm. Feed is operated through a two-speed gear box and ranges from 1/4 to 7 ipm. Cutter spindles are 12 in. in diameter and are taper bearing mounted. Tungsten carbide tools are used.

*Steel 11/4/46; Item No. 9682*

**Gas Carburizing Furnace**

Line of electrically heated, cylindrical, gas carburizing furnaces with maximum temperatures of 1800° F is being manufactured by Industrial Heating Division, General Electric Co., Schenectady, N. Y. Featuring rapid and uniform distribution of carburizing gas throughout the charge



through use of a fan located on furnace cover, the furnaces are suitable for carburizing such parts as gears, splines, pins, and bearing races.

Three furnaces in the line, rated at 59.5 kw, 77.5 kw, and 110 kw, have loading baskets in three sizes: 20 in. in diameter by 24 in. deep; 20 x 36 in.; and 25 x 36 in., respectively. Furnace cover is lifted hydraulically, and guides are provided which prevent it from being lowered un-

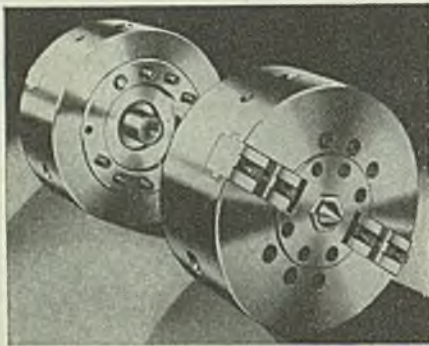
(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 128.)

less it is in proper position for sealing furnace retort.

Tanked propane or natural gas is admitted to the furnace retort as carburizing medium, flow of which is regulated by a needle valve and a visual flow meter. Also located on panel are an automatic temperature control instrument and a strip chart temperature recording instrument. *Steel 11/4/46; Item No. 9758*

## Power Chuck

Two-jaw compensating power chuck, shown here, was designed by Skinner Chuck Co., 344 Church street, New Britain, Conn., to drive work on centers



where exceptionally heavy cuts are being taken with carbide-tipped tools at high spindle speeds. Compensating action of jaws, sufficient for gripping rough-forged or cast surfaces, is provided by a rocker attached to a plunger. Chuck is available in 8 and 12 in. diameter sizes for A6 and A8 spindles respectively.

*Steel 11/4/46; Item No. 9883*

## Vapor Steam Cleaner

A vapor steam cleaning machine for various industrial cleaning operations is announced by White Engineering & Mfg. Co., 122 West Passaic street, Rochelle Park, N. J. Designated as model MO-46B, it is manufactured either as a stationary



unit with base, a movable unit with casters or as a trailer unit.

Two valves enable one man to operate machine. Pressure is automatically controlled throughout cleaning operation. Electric ignition enables working pres-

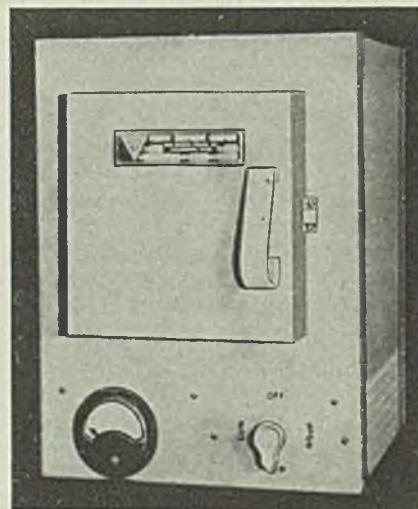
sure of 100 psi to be rapidly reached. Sootless down-draft burner and long flame travel allow good combustion completely eliminating deposits of unburned fuel on heating coils.

Cleaner burns No. 1 fuel oil, kerosene or light oil and can be used with any high grade steam cleaning material of standard make. Standard models are equipped with a ½-hp 110 v., 60 cycle ac motor. Unit also is equipped with 25 ft of oil-resistant steam hose.

*Steel 11/4/46; Item No. 9727*

## Heat Treating Furnace

Versatile heat treating furnace for small workshops and laboratories, utilizing temperatures up to and including 1850° F, is being marketed by Pereny Equipment Co., 842 North Pearl street, Columbus, O. Known as Model 220-W, it is applicable



in plastics, heat-treating of metals up to its peak range, porcelain enameling and laboratory control work.

Furnace is insulated, has a wall-thick hinged door and includes resistance wire wound embedded elements for heating to its high temperature. It operates on 115-v and draws 1500 w.

*Steel 11/4/46; Item No. 9712*

## Intercommunication Unit

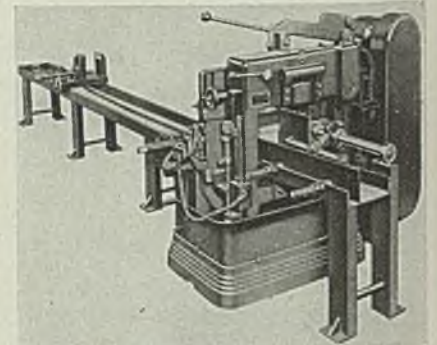
New dust and moisture-proof, metal-housed, industrial type intercommunication staff stations for remote and privacy operation, are being introduced by Executone Inc., 415 Lexington avenue, New York 17. They are designed for communication problems in refrigerated rooms, shipping and receiving platforms, foundries and other locations where they will be exposed to rough usage.

Equipped with a call-origination button, remote type model C-22 unit permits user to receive a call and reply from a

distance of 20 ft without approaching the station. Feature of these new models is concealed terminals built inside cabinet. *Steel 11/4/46; Item No. 9655*

## Bar Feed Conveyor

Automatic pull-up and automatic gaging in lengths from ¼ to 48 in. are made possible through the development of a mechanically controlled power saw announced by Peerless Machine Co., Racine, Wis. Metal is fed forward within a 4-sided saw-frame assembly which completely surrounds the work as the metal is being cut. When the cut is completed,



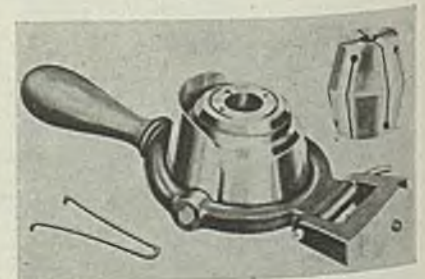
conveyor feeds predetermined length of metal into saw, the multiple bar-clamping vise releasing and setting automatically.

In case of accident or blade breakage, a blade-safety, microswitch stops the machine automatically. When the last remaining stub of metal on the conveyor contacts the limit switch, the cycle automatically stops. Conveyor is built in 7 x 7 and 11 x 11-in. sizes. A 14-in. model is supplied only with a manually-operated conveyor.

*Steel 11/4/46; Item No. 9711*

## Collet Chuck

Adaptable to any standard bench lathe, the Miracle collet chuck, shown



here, can be installed in a few minutes and used with stock up to 1 in., permitting full capacity of lathe. Manufactured by Micro Parts Co., 322½ East Beach avenue, Inglewood, Calif., the entire unit revolves on the spindle, which eliminates heat and friction; no bearings or retainers are employed. Addi-

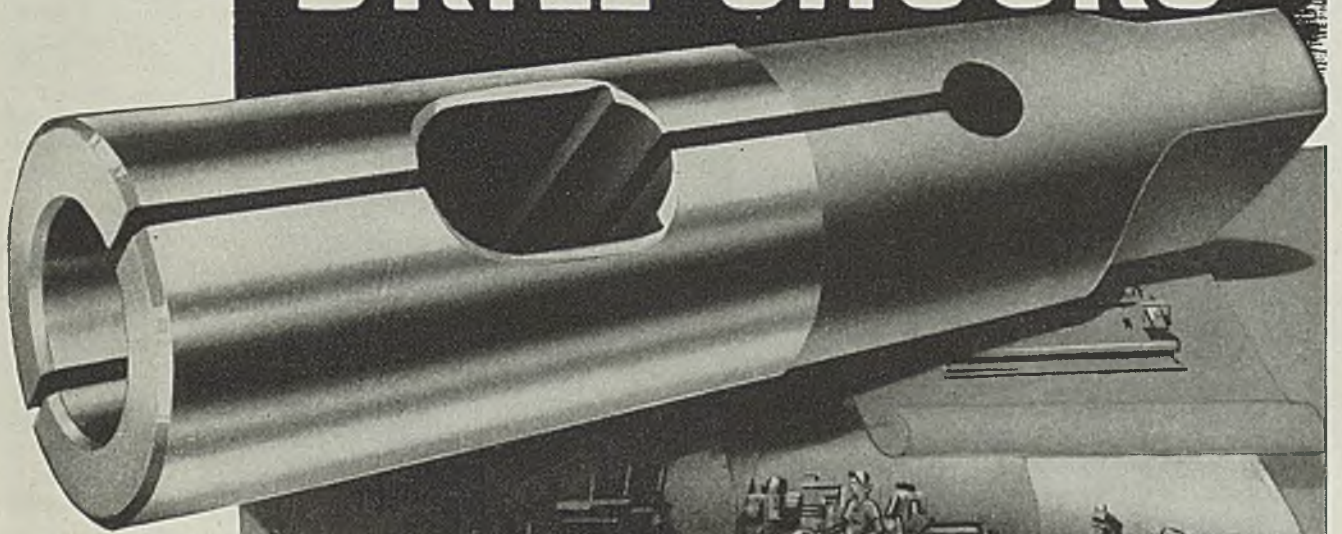
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tional collets are available in rounds, squares and hexagons.

Steel 11/4/46; Item No. 9878

## Forming Press

An oversize die cushion is featured in the self-contained, 500-ton forming press introduced by Watson-Stillman Co., Roselle, N. J. New cushion size will adapt press to larger and more varied loads than those previously allowable. Surface dimensions of cushions are 3 ft 4 in. by 3 ft 4 in. Maximum tonnage is 175 and stroke is 18 in.

Working pressure of the press is 2000 psi. Pressure is controlled by a single knob. Press control is through a manually-operated lever. A push-button handles single-cycle automatic operation, and reversal is pressure-controlled.

Press advances and returns at a speed of 300 ipm. Speeds in compression are 30 ipm for pressures up to 250 tons and 8 ipm above 250 tons.

Steel 11/4/46; Item No. 9591

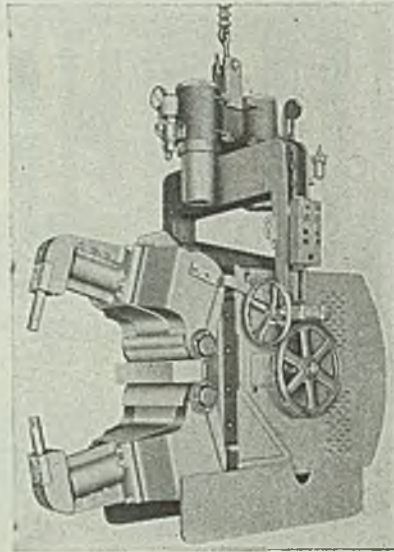
## Portable Spot Welder

Portable spot welder capable of welding up to three thicknesses of ½-in. structural steel without removing dust and scale is being manufactured by Sciaky Bros. Inc., 4915 West 67th street, Chicago 38. Application is primarily for speeding prefabrication of large structural units in shops.

Welding through rust and scale is accomplished by an electronically-controlled 3-phase sequence which provides a preweld period of high pressure and low current which burns off oxide, a high-current welding period during which electrode pressure is reduced for efficiency and a post-weld period which retains high current under high pressure

to prevent coarse structure and internal cracks.

Peak power demand when welding the maximum thicknesses is only around 500 kva. Speed is from 2 to 25 spots per



minute, depending upon thickness and degree of scale. Machine may be either suspended from crane or pedestal-mounted.

Steel 11/4/46; Item No. 9732

## Break-Proof Drill

Enesay Tool Co., Los Angeles, announces a practically break-proof drill which cuts through intensely hard and very soft metals with equal facility. It readily drills through steel hardened to 68 rockwell C.

Tool frequently eliminates need for internal grinding, since it is designed for precision drilling and reaming to extremely close tolerances. Drill is constructed of a new alloy which makes possible the penetration of hardened steel without im-

pairing the metallurgical properties of the metal. Only the metal removed during drilling is softened, the surrounding metal remaining unaffected. Tensile strength of the drill is more than 45,000 psi. It is available in all standard and special sizes. Steel 11/4/46; Item No. 9645.

## Portable Pyrometer Kit

New portable model 2863 pyrometer kit introduced by Wheelco Instruments Co., 847 West Harrison street, Chicago 7, contains a high resistance portable pyrometer (equipped with a "pistol grip" handle), a straight type extension with adapter for iron-constantan surface thermocouple and an assortment of thermocouples. An additional adapter is furnished for use with bare and prong thermocouple tips which also are included in the kit. Steel 11/4/46; Item No. 9649

## Contact Connector

Self-separating connector, developed by Winchester Co., New York 17, N. Y., eliminates prying and pulling required to disengage multiple contact connectors. An exclusive wiping action plus spring-loaded contacts makes either contact or separation smooth, easy and instantaneous.

Molded of plastic, the one-piece inserts reduce danger of flashover due to moisture and dust accumulations. Connector can be supplied with a simple self-contained locking device for applications with very close space limitations. Two heavy guide pins, acting as ground contacts, perform the additional functions of alignment and polarization.

Contacts are designed for use with a maximum wire size of No. 16 AWG and are available in two sizes; 18 contacts (QRE18) and 12 contacts (QRE12). Steel 11/4/46; Item No. 9651

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# CONTINENTAL KONIK<sup>★</sup>

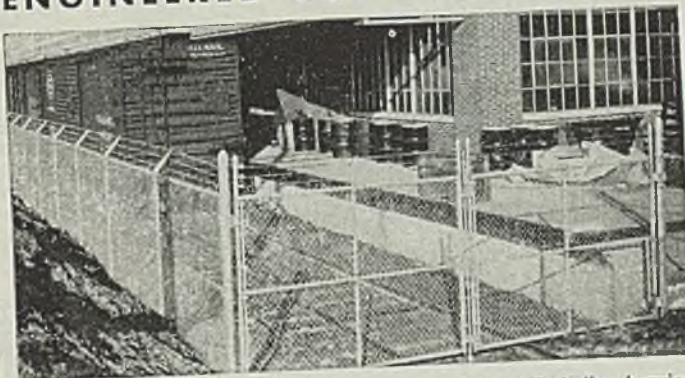
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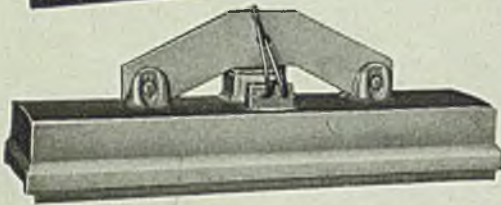
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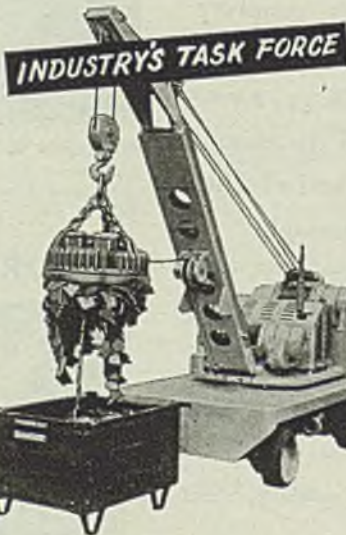


**For specific applications**—used singly, in duplicate, or in triplicate on a spreader beam for long plates or other materials—Types P & F Rectangular Magnets. Sturdy, dependable, low maintenance. Bulletin 903.

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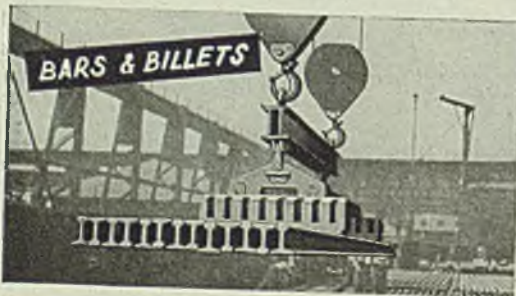


**For heavy duty service such as handling scrap, pig iron, and nail keys on a tonnage basis**—Type SW All-Welded Circular Magnets. Streamlined design—high lifting capacity—water-tight coil within a watertight housing. Bulletin 900.



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## Casting Magnesium Alloys

(Continued from Page 95)

sive castings. The concentration of the agent slowly decreases as the sand is used, and more must be added to obtain the proper degree of protection. A convenient control method is to hold the total water-soluble salts, as indicated by simple analysis, within set limits by the addition of ammonium silicofluoride and boric acid. Powdered sulphur additions are made as indicated necessary by a determination of the CS<sub>2</sub>-soluble content of the sand.

**Cores:** Cores for magnesium castings should be made from an open sharp sand, and should be provided with adequate vents to facilitate removal of hot gases. For binders, resins are preferred to oil because resin-bonded cores can be softened more readily with heat. Synthetic urea-formaldehyde resins are extensively used as core binders; oils, when used as core binders, usually require a baking temperature of 360 to 375° F, Fig. 8. Cereal binders find a limited application.

Since cereal-bonded cores show a tendency to absorb moisture, special care is necessary to keep them warm and dry before use. It is necessary that the core sand be treated with an inhibitor to prevent burning of the heavy metal sections. A typical core sand mixture for general use is as follows: Sand—100 lb, sulphur—1 lb, boric acid—½-lb, liquid resin binder—1 pt, water—3½ pt.

Cores for magnesium castings should have a minimum of binders and should be baked thoroughly. Temperature of baking will be dependent on type of binder, but generally will average about 325°F. The cores are necessarily soft and to facilitate pasting, the joining surfaces are painted with a 1 to 3 shellac-alcohol solution to give a stronger surface. Care is taken that the paste does not come through to the surface of the core with resultant danger of a blow. Joint lines and shallow surface defects may be smoothed with the following mixture, made up to a soft paste with denatured alcohol containing a little lubricating oil for bond: Talc—25 parts, sand (200 mesh)—75 parts, sulphur—2 parts, boric acid—2 parts. The area treated is thoroughly dried by torch or by returning the core to the oven.

Chills are placed in the cores where necessary and may be either of the round bottom type or formed to fit the contour of the casting surface. Cast iron generally is used, as it is cheap and does not alloy with molten magnesium. The greatest objection to copper-base chills is the contamination of melts from chills adhering to scrap castings. It is necessary that the chill be clean and free from any rust or moisture. This is best accomplished by the use of some type of

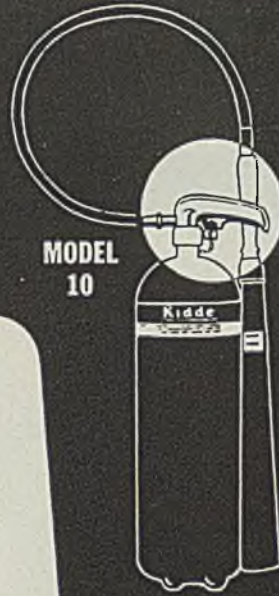
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2½



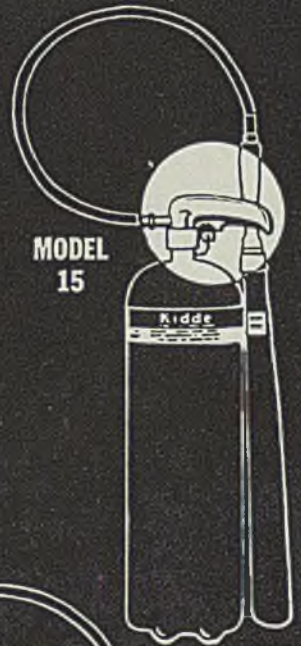
MODEL  
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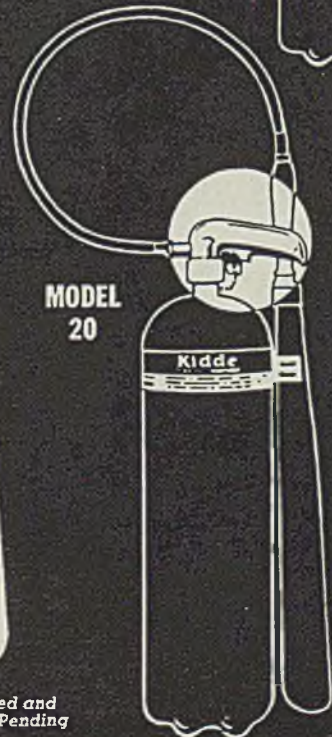
MODEL  
10



MODEL  
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coating; a suspension of talc in alcohol containing 1 oz./gal. of either "Mazein" or resin makes a satisfactory coating material.'

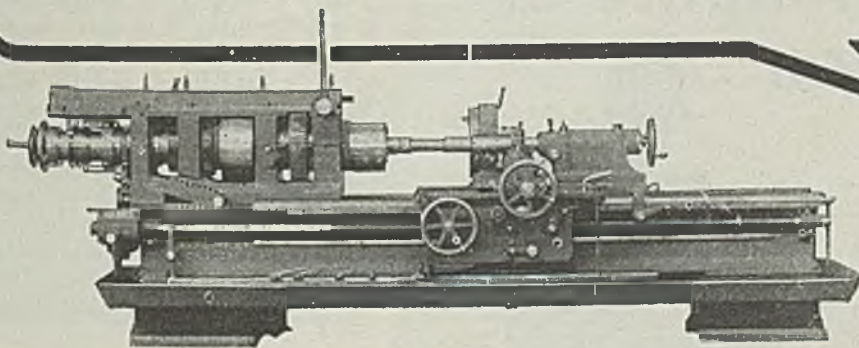
**Molding Practices:** The molding of magnesium alloy castings is probably the most important single phase of the entire foundry procedure. While for all metals it is desirable foundry practice that the mold be constructed so that the metal will flow into the mold cavity smoothly and with a minimum of turbulence, it is of vital necessity with magnesium alloys. Deviation from this basic rule will result in scrap castings. Excessive turbulence in the metal stream from the time it leaves the melting unit until the metal has reached its final place in the casting, will cause oxide skins to become mixed with the metal during this process.

These oxide skins, which are of about the same specific gravity as the metal, do not operate from the metal but are swept into the casting where they tend to rise to the cope side and appear after sandblasting as surface defects. In addition to the surface defects caused by the oxide skins, a further result of turbulence in the metal stream is the entrapping of bubbles of air, which also tend to rise to the cope surface and are opened during cleaning operations to appear as blows or gas holes.

To avoid turbulence in the mold, the casting should be gated in such a way that the metal will be brought into the mold cavity at the lowest point and the gates so arranged that the sprue can be filled as quickly as possible after pouring starts. Of vital importance in the proper filling of the mold, is the use of a correctly designed pouring basin. This may vary in size from small cast iron type on bench molds, to large ones made of green sand for large floor molds. The basin must always be long enough and deep enough to allow the metal stream to enter without direct impingement on the sprue and to permit the metal to quiet down before entering the sprue.

Two types of sprues are used, namely, round and rectangular slots. The round sprue is molded more easily and is commonly used in conjunction with the perforated skim gate. The rectangular slot sprue is claimed to decrease turbulence because of the prevention of any swirling tendency of the metal. The casting should be filled through a number of gates rather than through a few large ones. A common type of gating is to place a ring runner completely around the casting with a number of gates entering the casting uniformly around its circumference. Risers are used freely to insure the soundness of heavy

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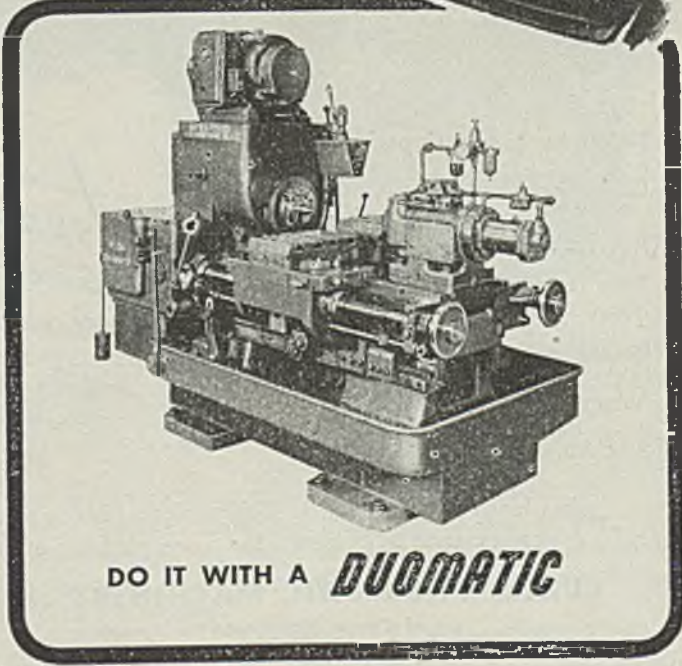
● Your "old-time" lathe may have done a job for years . . . and you may coax some kind of production out of it for sometime to come. You may patch it up . . . replace the worn-out parts with new parts . . . refit worn sliding surfaces . . . but you haven't added any horsepower. All you have done is to correct known inaccuracies.

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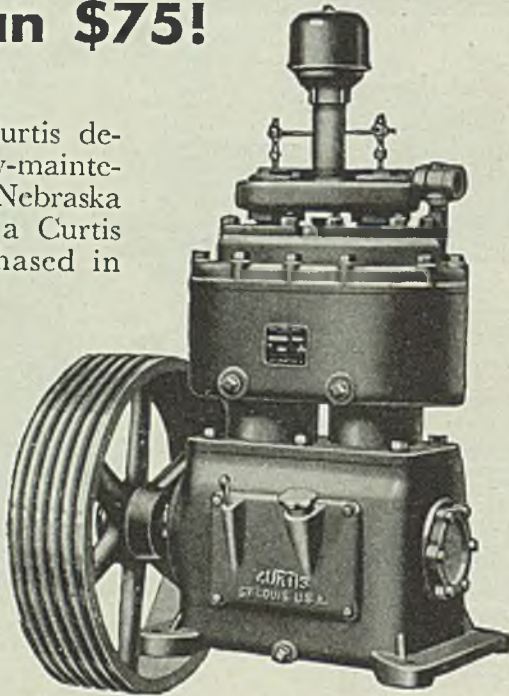
## AIR COMPRESSOR

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sections of castings. Because of the light weight and low heat content of the metal, it is necessary that the riser be connected as directly as possible to the section to be fed.

**Melting Practice:** Magnesium alloys for sand and permanent mold castings are melted by two methods, the open flux pot and the crucible. The open flux pot method uses a relatively large amount of a fluid magnesium chloride—base flux at the bottom of a large, cast steel, stationary pot. The flux serves the dual purpose of cleansing the metal and protecting it from oxidation. The metal is hand-dipped in ladles holding up to 25 lb. The present use of this method of melting is limited to the production of small castings and to cleaning and reclaiming scrap. The crucible method, using individual melts, is used much more generally, and is more adaptable to pouring large castings and to the usual production methods used in the foundry.

Crucibles ordinarily are made of low carbon steel. A "fire-box" grade of steel may be desirable for the larger sizes. Crucibles are used without lining as iron is almost insoluble in molten magnesium, even at 1600° F. It is desirable that the furnace design and the combustion control be such as to minimize the scaling on the outside of the crucibles. If molten oxide from a leaking crucible comes in contact with hot iron scale, a violent reaction of the "thermit" type may result.

Nonscaling stainless steels containing considerable nickel cannot be used for crucible construction because of the resulting contamination of the melt with nickel. At present, the most practical solution of the scaling problem appears to be the use of low carbon steel crucibles with the outer surface calorized or aluminum-sprayed. Satisfactory results also have been obtained by dipping freshly sandblasted steel crucibles in molten aluminum for 20 min at 1500° F. Crucibles coated with aluminum by any of these processes do not scale but are discarded after 250 to 300 heats because of distortion, and thus give three to four times the life of ordinary steel crucibles.

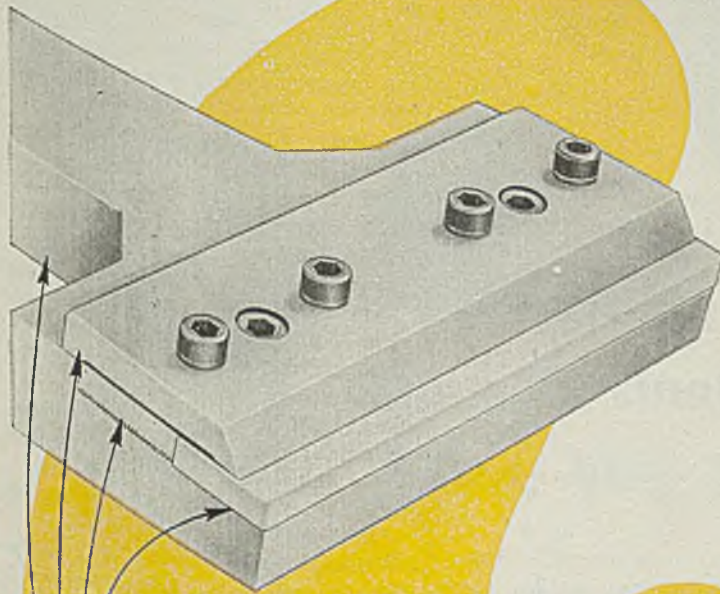
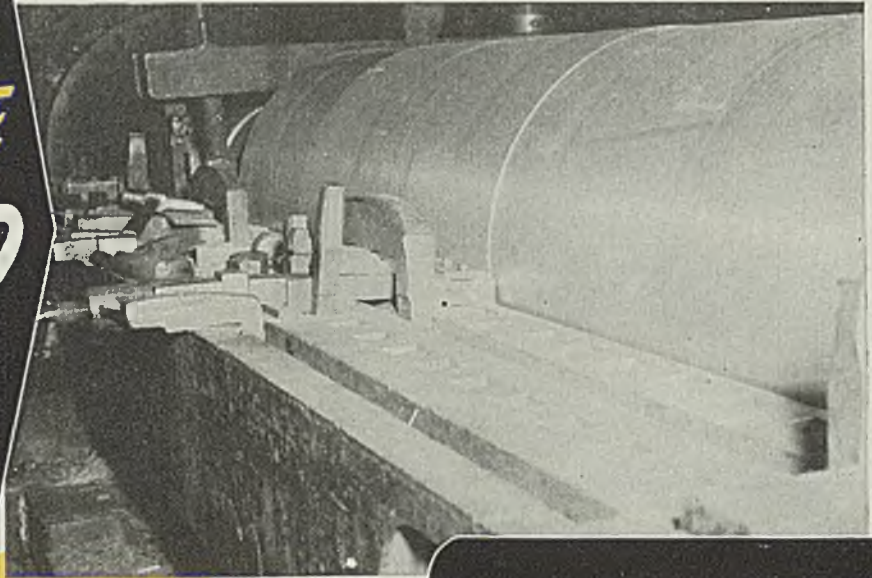
**Fluxes:** All melting processes for magnesium and its alloys require the use of fluxes. These fluxes have a magnesium chloride base. Other halide salts or oxides are added to give a density or behavior exactly suited to the particular melting practice. The successful handling of magnesium depends to a large extent upon the proper use of the correct flux.

In order to give a clear understanding of the types and uses of fluxes com-



**NOW  
THEY CAN BE  
TURNED**

*and  
at Far Less Cost\**



• Rugged, solid Kennametal Blade... hard, strong Grade K6; clamped-in, advanceable, four cutting edges.

• Shank, clamp, and back-up plate are heat-treated steel.

Available in four sizes — cutting widths of blades: 4", 6", 8", and 10".

\*For example, a roll that required 25 hours for rough grinding was turned with two 8" Kennametal Tools in 8½ hours.

**"UNMACHINABLE"  
CHILLED  
CAST-IRON ROLLS  
[ UP TO 90 SCLEROSCOPE ]  
CAN NOW BE TURNED  
with the NEW  
KENNAMETAL  
ROLL-TURNING TOOL**

Turning chilled cast-iron rolls costs far less than the traditional process of grinding—and here's the tool that can turn even "unmachinable" castings—up to 90 Scleroscope . . .

A sturdy Kennametal Grade K6 blade is securely held in place on an accurate surface of the supporting shank by a clamp and serrated, advanceable back-up plate—each of hardened steel.

The blade has four cutting edges that may be used in succession before any sharpening is required. Then it can be reground time and again (long sides only) and advanced each time to cutting position, until ¾ of it has been utilized.

There's one positive way to prove this new Kennametal tool can greatly reduce your cast-iron roll production costs—and that's under actual working conditions in your shop. We'll demonstrate—invite us.



**KENNAMETAL**

SUPERIOR CEMENTED CARBIDES,

KENNAMETAL Inc., LATROBE, PA.



**Reduce Costs! Avoid Injuries!**  
**Increase Production!**

**WELDISKS** grind better because they lie flat . . . do not soften up . . . do not curl or warp.

**WELDISKS** last longer, thereby reducing costs, because, unlike ordinary disks, their amazing cold-setting cement (a scientific formula – not glue or resin) actually improves with age!

**WELDISKS** avoid breakage and injuries to operators because of their laminated backing of fibre for stiffness plus cloth for strength.

**WELDISKS** are better disks. Prove it to yourself! Make your next grinding disk order specify **WELDISKS** – see how this safer disk cuts faster and lasts longer.

**Abrasive Products, Inc.**  
 SOUTH BRAINTREE 25, MASSACHUSETTS • MAKERS OF JEWEL COATED ABRASIVES

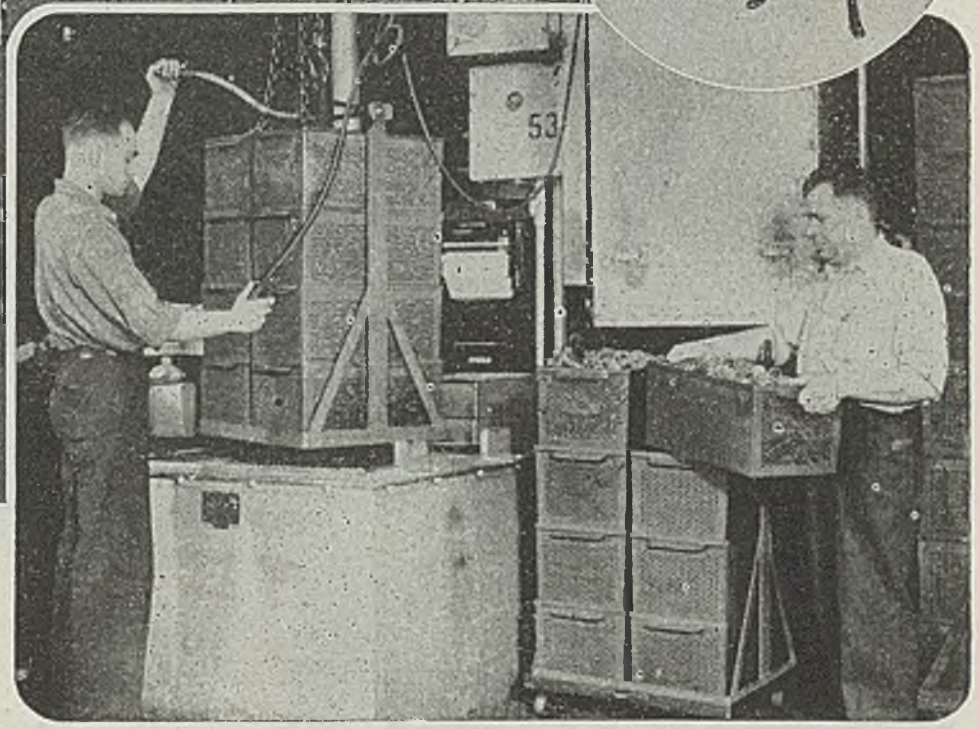
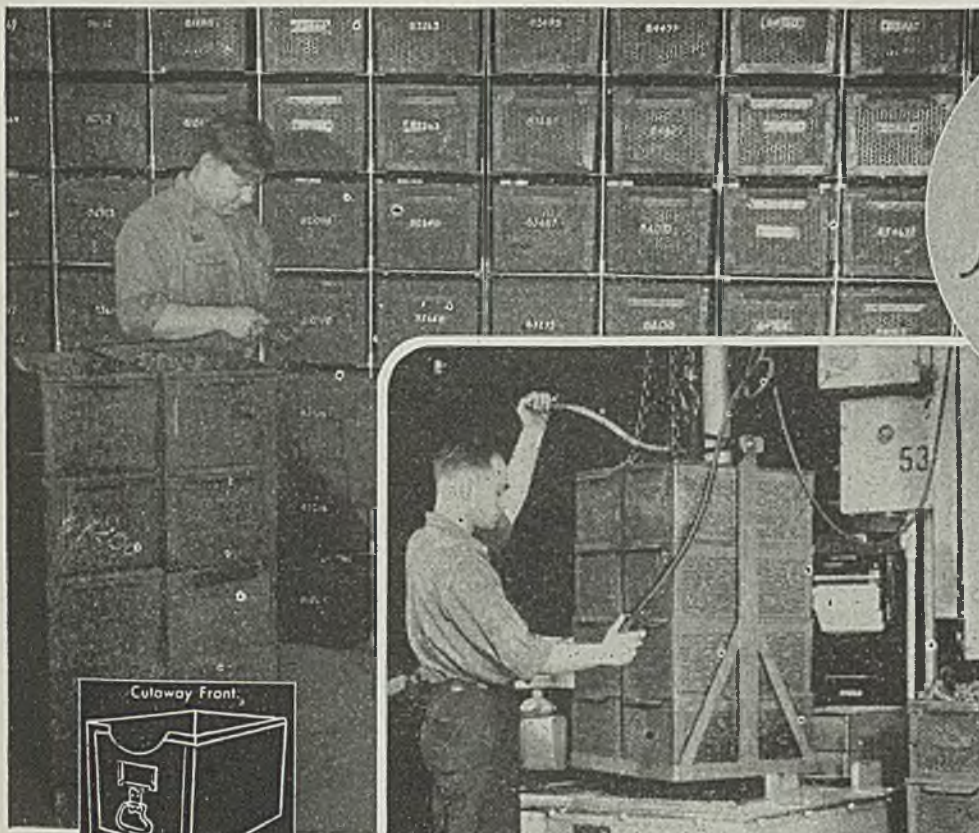
monly employed for the melting and refining of magnesium, a list of compositions<sup>8</sup> is included in Table XI. The compositions and designations shown in Table XI are those of Dow Chemical Co., but it should be pointed out that within the last year or two other suppliers have put fluxes on the market. Among these suppliers are Basic Magnesium Inc. and Permanente Metals Corp.

For use in foundry pouring crucibles, special fluxes containing added thickening agents are available to enable easy removal of the flux cover. In beginning the melting operation a light sprinkle of flux is placed in the crucible, which is then charged with ingot and scrap metal. As metal is charged and during the melting process flux is dusted on the surface in such quantities as are needed to prevent burning. After the metal is melted, and at a temperature not exceeding 1300° F, the melt is stirred. The operation is performed with a 1-in. L-shaped iron rod with the short leg of the "L" approximately the depth of the crucible. This stirring rod is moved in the crucible to give a rotational motion to the melt.

During the stirring operation, flux is added in sufficient quantity to form a fairly heavy coating on top of the melt. The stirring causes the flux to wet the oxide particles in and on the melt, thereby making them heavier and causing them to separate and sink to the bottom of the crucible. If the stirring and fluxing have been done properly, the metal surface will have a clear silvery luster. If it appears dull or frothy, the dross and flux should be removed from the surface of the melt with a skimmer and the stirring repeated with a fresh flux.

Normal consumption of flux in the crucible melting method is between 2 and 3 per cent of the weight of the metal melted. The crucible charge may consist of either 100 per cent virgin ingot, 100 per cent scrap, or a mixture of both. If the melting operation is properly carried out, the properties of the resulting castings will be independent of the nature of the charge. Usual foundry practice is to use about 40 per cent ingot and 60 per cent scrap for each melt. Scrap for use in the crucible should be clean and free from metal screens and adhering sand.

**Heating and Pouring:** After the flux stirring operation is completed the surface of the melt is covered carefully with flux, and the crucible contents are heated to approximately 1650° F, and then allowed to cool to the casting temperature, which generally is about 1400° F. The superheating operation



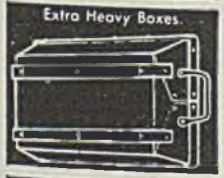
Culaway Front.



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For Conveyor Use.



Extra Heavy Boxes.



Short formed around  
standard shipping  
boxes to fit height.  
Weight from any part  
access to contents  
without opening lid  
is made on each side.



Chip Pan and Truck.



Rolls. Slits. Laundry Barrel.  
Rings. Crane hook barrel.  
Common. Castor truck for moving  
shop barrels.

**Shop Barrels, Boxes, Chip Pans, Waste Cans, Tool Stands**

**Yes, WE BUILD 'EM TO FIT**

● "Cleveland" steel shop containers are individually engineered for maximum efficiency, as an essential link in your materials handling system. If one of our many stock styles or sizes does not answer exactly, we design and build to order, to fit your products, your shop transportation equipment, production machinery and other factors governing size, shape and special features.

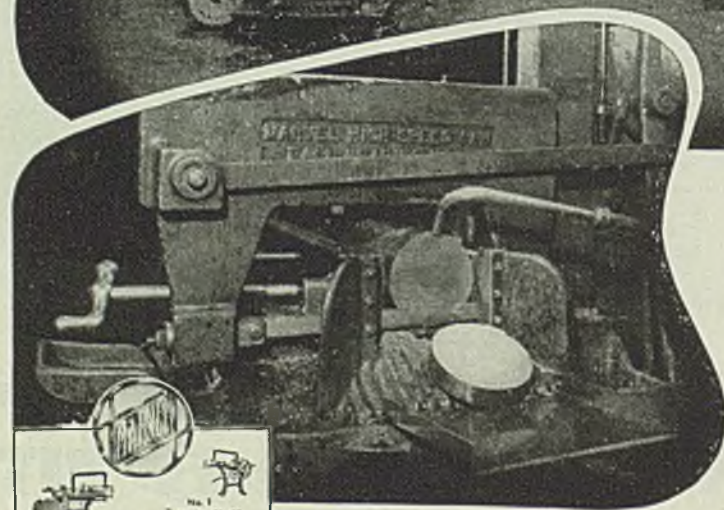
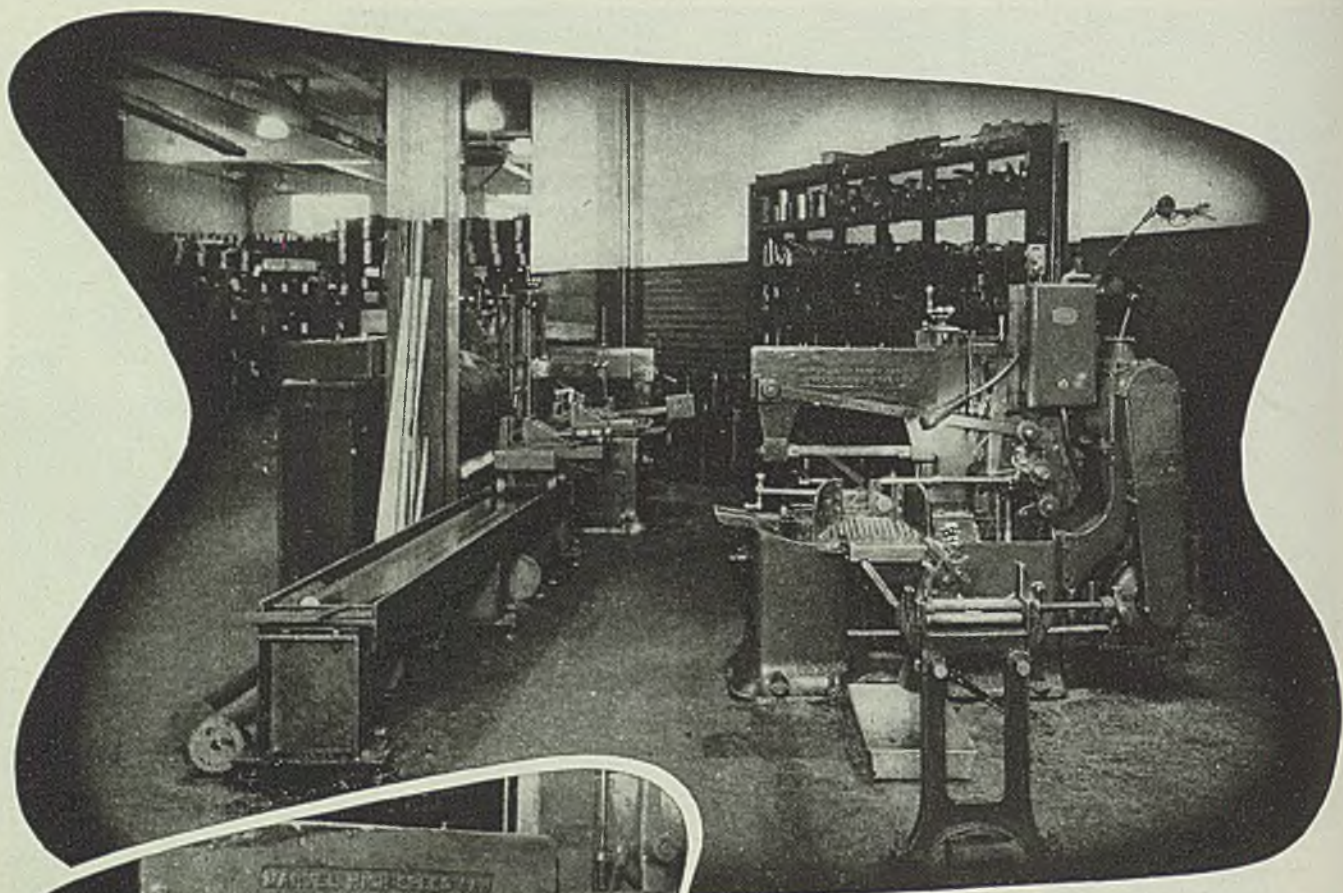
Shop containers so designed and built in many plants have been instrumental in speeding up production and lowering unit cost, often paying for themselves in a few weeks or months; for their cost is small, the results big.

Besides offering many stock sizes and styles of shop barrels, boxes, pans, cans, stools, tool stands and cabinets, bins and shelving, "Cleveland" has become national headquarters for built-to-order steel shop equipment.

*New Catalog*—illustrates nearly 100 different kinds and sizes. Contains many useful ideas on more efficient materials handling and storage. Ask for it.

**Cleveland STEEL SHOP EQUIPMENT**

**CLEVELAND WIRE SPRING CO.**  
2012 West 25th Street, Cleveland 13, Ohio  
Subsidiary: Reynolds Spring Company, Jackson, Mich.



## No "waiting" cost here!

There are no costly delays, no men and machines standing idle, waiting for stock to be cut off from bars, when the stockroom is equipped with a No. 6A or 9A MARVEL High Speed Sawing Machine.

These *fast*, all-ball-bearing high speed saws will cut off accurate lengths or slices at almost unbelievable speed. Equipped with an automatic bar push up, they will cut identical pieces from single or nested bars automatically, with no more operator attention than an automatic screw machine. Still, at any point, the automatic operation can be interrupted, a miscellaneous cut made, and the "production" run resumed by simply re-engaging the bar feed. A single MARVEL Automatic can keep well ahead of a large machine shop, increasing the earning time on all machines.

There is a MARVEL Saw for every need—in every capacity range and price class. Your local MARVEL Sawing Engineer will gladly study your metal sawing problems and requirements and make recommendations as to methods and equipment.

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**ARMSTRONG-BLUM MFG. CO.**

"The Hack Saw People"

5700 Bloomingdale Ave.

CHICAGO 39, U. S. A.

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# MARVEL SAWS

STEEL

refines the grain and thereby improves the mechanical properties of the alloy. After the crucible is ready for casting, the surface of the melt is cleaned by carefully spudding away and removing the scale of flux and oxide from the pouring lips and from surface of the melt.

The metal burns readily at this temperature (1400 to 1600° F) as soon as the protecting flux layer is removed. Burning during the cleaning of the melt and the pouring, Fig. 6, of the casting is controlled by dusting on the surface of the metal a powder containing 80 per cent sulphur, 17.5 per cent boric acid and 2.5 per cent ammonium borofluoride.

It is standard practice in some foundries to add 0.05 per cent metallic calcium to the crucible just before the metal is poured. Calcium helps prevent surface oxidation of the casting in the mold if the agents in the sand do not adequately protect the metal. The calcium may also afford some protection during heat treatment. The amount added must be controlled carefully because more than a few hundredths of a per cent slow up the rate of solution heat treatment.

Throughout the entire foundry practice accurate melting and pouring temperature control is necessary, and this is secured by the use of either chromel-alumel or iron-constantan thermocouples in mild steel protection tubes immersed in the melt.

**Casting Finishing:** After cooling for a safe period following the pouring, castings are shaken out by hand or on vibratory screens. The cores are removed by vibrating, and with hand and air tools. After sand blasting the gates and risers are cut off with metal-cutting band saws, usually having four teeth per inch and running at 8000 rpm. The gates and risers from very heavy castings may require removal by air chisels. Lathes and other machine tools also are used to remove gates and risers not easily accessible for sawing.

If heat treatment is desired this usually is done before the final cleaning operation. Details of heat treatment procedures will be described in a subsequent section. Likewise, the details of a number of appropriate chemical finishing treatments applicable to magnesium castings will be described in the section devoted to finishing.

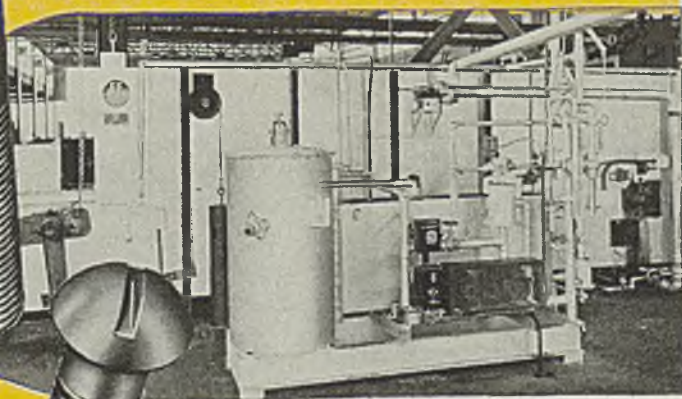
**Testing Castings:** Castings frequently are pressure tested with air or water to determine their tightness for certain applications. While improved gating and rising methods will go far in securing tight castings, occasional recourse to impregnation is necessitated by the design of particular castings.

There are three general methods\* of

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*Showing continuous electrically controlled draw and annealing furnaces.*



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*Cap Screws In All Sizes  
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**TRIPLEX** THREADED FASTENERS  
CAP AND SET SCREWS • BOLTS, NUTS AND RIVETS

# CUTTING OILS

at BARGAIN PRICES

APPROXIMATELY 685,284 GALLONS

Priced at 20¢ to 30¢ per gallon

Machine tool shops everywhere can now secure high grade cutting oils at these low prices. These oils were manufactured under exacting government specifications and include alkaline soap solutions, soluble oils, straight mineral oils, mineral lard oils, and chlorinated and sulphurized base oils blended with mineral oils.

They are available immediately and are for sale by the following Regional War Assets Administration Offices:

LOCATION	GALLONS	LOCATION	GALLONS
Atlanta	17,049	Louisville	517
Birmingham	41,436	Minneapolis	67,137
Boston	18,111	Nashville	902
Charlotte	230	New York	83,899
Chicago	84,200	Tulsa	2,399
Cleveland	47,048	Omaha	3,498
Dallas	12,433	Philadelphia	75,684
Denver	29,292	Richmond	12,084
Detroit	85,045	St. Louis	17,658
Houston	2,922	Salt Lake City	3,399
Jacksonville	1,134	San Antonio	3,580
Kansas City	55,202	San Francisco	2,957
Little Rock	55	Seattle	5,333
Los Angeles	14,650	Spokane	447

These prices are f.o.b. point of shipment and apply to all levels of trade. All sales are subject to standard WAA terms and conditions of sale. Minimum quantity five drums (55 gallons each) except where specific items may be packed in smaller containers in which case minimum purchase shall be 200 gallons.

Offers to purchase the above material will be accepted until noon November 30, 1946 by any Regional Office having an inventory at which time orders will be filled in the following sequence as provided by law:—

1. Certified Veterans of World War II;
2. Subsequent priority claimants;
3. Non-priority purchasers.

Federal agencies have had opportunities to fulfill their needs. VETERANS OF WORLD WAR II should apply to their nearest WAA Regional Office for certification; the case number assigned and the location of the certifying office must be stated in a veteran's offer to purchase.

Address your purchase offer to the Regional Office nearest you having the inventory

## WAR ASSETS ADMINISTRATION

760

impregnation in general use: Styrene-drying oil copolymer process; (2) tung oil process; (3) silicate process. It is generally thought that the most commonly used material of this type at the present time is the styrene-linseed oil solution. This process is reported to have certain advantages in that it is simple to operate, is polymerized at low temperature, is efficient in sealing upon the first impregnation, is low in solution cost, and has long useful life throughout production.

During the war tung oil became a very critical material, and it was fortunate that research had developed a satisfactory substitute process, at this time of tremendous increase in production of magnesium castings for war use. The silicate process, which is commonly used on aluminum castings and to some extent on magnesium, lends itself to both the chamber and batch methods of impregnation, but is usually operated in production process using the former method.

Commercial impregnation is carried out by two general methods. The most simple is the chamber process or individual casting method, wherein a given part is set up in a suitable fixture so that the impregnating fluid may be placed inside the casting with all openings closed except one, through which air or liquid pressure is applied. The pressure exerted upon the contained fluid tends to drive the liquid impregnant outward through the pores of the casting thus filling them.

A second or more commonly used method where large quantities or a variety of shaped castings are to be treated is known as the batch method. The castings are treated by placing them in an autoclave, sealing the autoclave, evacuating to remove the air from the porosity, filling the autoclave with the impregnating solution, applying a liquid or air pressure to force the solution into the pores, and finally releasing the pressure and removing the castings from the autoclave.

After the porous areas are filled with the impregnating liquid the castings should be rinsed free of all superficial solutions by the use of a suitable solvent. The impregnating solution must not be allowed to remain on the surface of the casting since a coating such as this will interfere with the application of subsequent chemical treatment processes.

(To be continued)

### REFERENCES

- <sup>1</sup>A.F.A. 45th annual convention, New York (1941)
- <sup>2</sup>Am. Inst. Mining & Met. Engineers N. Y. meeting (Feb., 1944)
- <sup>3</sup>Light Metal Age, May, 1944

Los Angeles Times

9 AM FINAL

...TED AND ME

# 1280-Mile Gas Line Authorized

Project Will Cost  
\$70,000,000 to Bring  
Texas Fuel Here

A 1280-mile, \$70,000,000 pipe line to bring natural gas here from Texas and New Mexico has been authorized by the Federal Power Commission, officials of two gas companies in Los Angeles were informed yesterday.

The pipe-line facilities are designed to meet a developing shortage in the local natural gas supply for 3,500,000 persons in California. F.P.C.

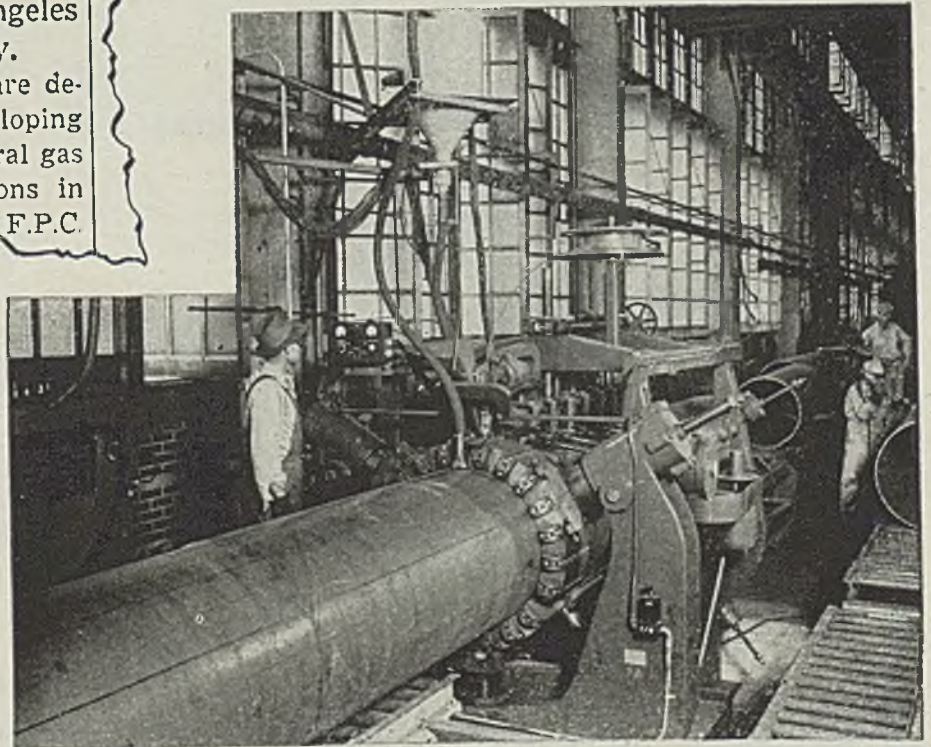
## *Berkeley Continuous* Longitudinal Seam Welders

will weld the seams of the  
largest diameter pipe-  
line ever authorized

It's a big job to weld the seams of 30" fabricated pipe. It must be done economically and the machines for doing it must be dependable—that's why the Consolidated Steel Corp. selected the 3C Berkeley for this important work. They know it will deliver uniform, high quality welds continuously day after day.

There's a size "Berkeley" to weld preformed tubes 5" to 36" in diameter.

Write us, we will suggest the best type for your requirements.



Illustrated is a Type 3C "Berkeley" in operation. Machines like this will be used for welding the pipe for this big undertaking.

**PENN TOOL & MACHINE CO.**  
DANVILLE, ILLINOIS

# PAGE *for* WIRE



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Yes, and Page can go a step further than that. PAGE can give you the benefit of long experience in recommending the most efficient use of wire in production. Just remember three words: "PAGE for Wire."

**ACCO**

Monessen, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

**PAGE STEEL AND WIRE DIVISION  
AMERICAN CHAIN & CABLE**



## Liquid Coolers

(Continued from Page 97)

oil which lubricated and cooled gun barrels and tools was passed through a filter and carried from the clean oil sump through the barrels by means of a 15 hp high-pressure coolant pump.

Under this schedule, oil temperature rose to 140° F, making it impossible to operate the machine. Drills tended to run out of alignment and time lost in readjusting, backing up, and starting again was excessive.

Following installation of a Model PL-300 liquid cooler, built by Chrysler Air-temp Division of Chrysler Corp., Dayton, O., cutting oil was held at 100° F, the machine was properly adjusted, and time required for drilling two gun barrels dropped to 2 hours and 10 min., an average maintained even during extremely hot summer weather.

### Peacetime Installation

A good example of what has been accomplished during peacetime in civilian production is the record of a central installation of three coolers at Wilkening Mfg. Co., Philadelphia. In making the installation, engineers found it expedient to use three PL-300 units in a single bank to stabilize the temperature of coolant used by three Besly, Model 926 grinders assigned to a finishing operation on cast iron piston rings.

The formed cast iron piston rings pass on a continuous feed between two stones where both upper and under surfaces are ground at high speed in one operation. The three grinders are identical, each machine operating independently, and the rings passing through only one grinder to finish their production. Each grinder is driven by two 10 hp motors.

The piston rings have a specified finish tolerance of 0.0003-in., which was easily maintained as long as the coolant was held at its proper working temperature. Until the grinders were speeded up, the Almag coolant used did its work perfectly. Required tolerance was easily held. However, the increased speed naturally entailed more friction, coolant reached a point of heat saturation long before mid-day, and rings in work would swell and ultimately crack. By the end of the day, each grinder would be producing more rejects than salable piston rings.

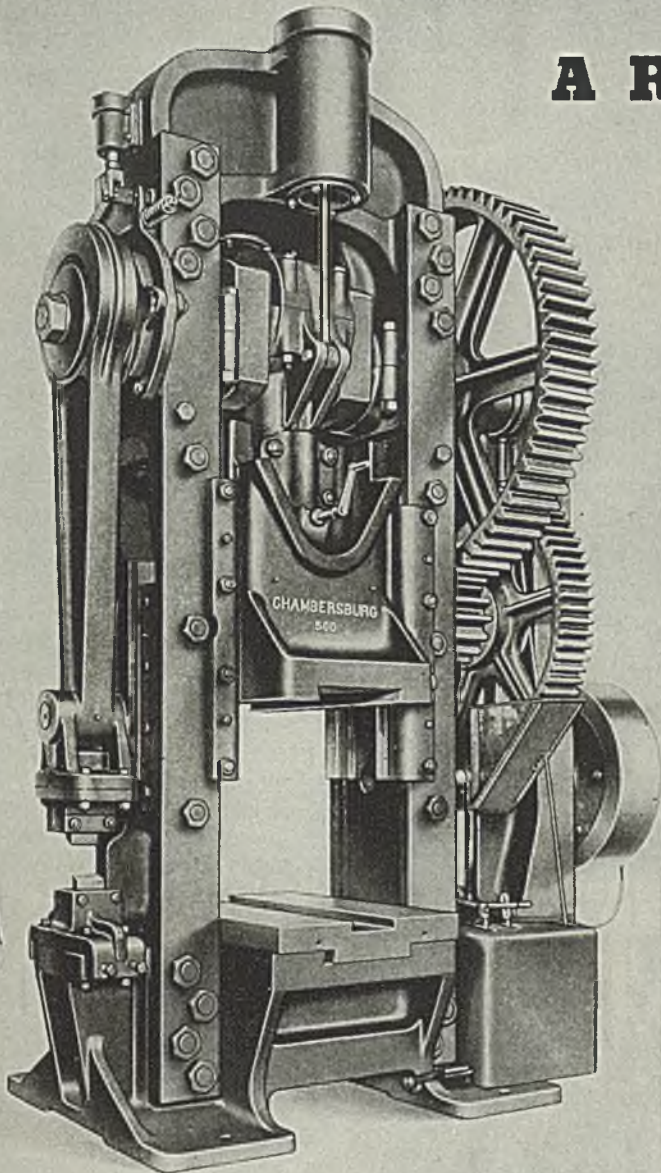
Upon the recommendation of Chrysler engineers, three PL-300 cooling units were installed. Each is self-contained with the exception of a coolant pump which is separately mounted outside the unit. The pumps, used to circulate the coolant, are fitted to the rear of each tank. Coolant is pumped through feeders into the main pipeline which carries it to other feeders serving the individual



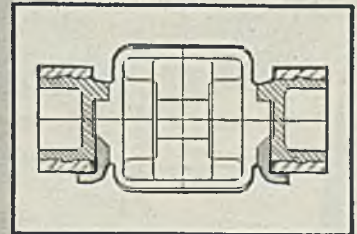
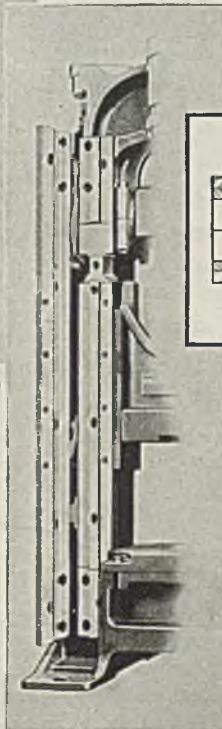
# A REMARKABLE MECHANICAL PRESS

—*practically indestructible!*

The exceptionally rugged and durable qualities of Chambersburg Steel Side Trimming Presses are well recognized by the men who use them. If you do not know them at first hand, you should look over the field records of every one we have built. You will find that *not one has ever had a major breakdown*. No operators or helpers have been injured through mechanical failures. Repairs have been exceedingly few and their cost negligible. Power consumption has been well below that considered normal for conventional presses of this type.



*Detail of  
Interlocking  
Side Frame Construction*



## INTERLOCKING FORGED STEEL SIDE CONSTRUCTION

(PATENTED)

Surprising strength and rigidity is attained by the side frame construction. The tongue-and-groove construction binds base, forged steel uprights and yoke into a rigid unit. Compare with non-rigid construction in other presses.

Accurate high quality work is made possible on Chambersburg presses by the same features of powerful construction and rigid alignment which make them practically indestructible, very economical to maintain and exceedingly safe to operate.

Their powerful construction and easy adjustment make them suitable for a wide range of work. They are used primarily for hot trimming and sizing in forge shops, but they may be used also for blanking, punching, bending and shaping.

*Write for Bulletin 208-A*

CHAMBERSBURG ENGINEERING CO., CHAMBERSBURG, PA.



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The operating mechanism of Shepard Niles hoists is completely enclosed, assuring permanent alignment—more durable, trouble-free, efficient service. Whatever your lifting or handling requirements may be, there's a Shepard Niles hoist for the job—more than 5,000 types and sizes.



*Powerful and rugged, Shepard Niles Cranes are available in any desired capacity and span—designed to handle greatly varying loads with precision, safety and economy. Shepard Niles Cranes have the same sound, progressive features as do the Shepard Niles Hoists. A request will promptly bring illustrated bulletins.*

# Shepard Niles

CRANE & HOIST CORPORATION

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The experience and facilities of Shepard Niles engineers are at your service. Plan ahead now for the right material handling equipment. Your inquiry will receive prompt attention.

machines. It is returned through another line leading from the machines back to the filter where it is reconditioned and redistributed to coolant tanks.

In the Wilkening installation, the three cooling units are set up to work in sequence. Operation is entirely automatic, the first cooler beginning to operate when the first grinder commences to function. When temperature of the coolant rises above a predetermined limit, the second cooling unit automatically goes into operation; when coolant again rises in temperature, the third unit starts to function. Conversely, when temperature drops to within the predetermined limit, one unit goes off automatically; if coolant again drops, the second unit will go off.

### Coolant Handles 30 GPM

Each cooler provides 3 tons of refrigeration and handles coolant at the rate of 30 gpm. In this particular installation, the third cooling unit operates intermittently as a sort of standby service, the other two coolers being able to assume the full load except for short intervals. Their effectiveness can be measured against shop reports which cover the 24-hour-a-day operations of three shifts over a protracted period of time. With the aid of liquid coolers, the same coolant has brought about beneficial changes in output and quality. Tolerance on piston rings is much more closely maintained, there is little need for machine adjustments to compensate for expansion in the tools or work, grinding wheels wear much longer and require less frequent dressing and replacement, and rings come out of the operation with an improved finish.

Some cutting tools will operate at high temperature, but the heat is still generated and passes into the work piece and into the oil, and is generally spread over parts of the machine. This causes misalignment inasmuch as uneven rates of expansion and contraction occur in various affected regions of the cooling machine.

A similar packaged cooler was installed at the American Hammered Piston Ring Division of Koppers Co. Inc., Baltimore, Md. Here it is used to cool the cutting oil which is supplied to two Excello automatic boring mills—one an 8-spindle and the other a 4-spindle mill—which are used to rough and finish bronze flanged bushings. The material is a leaded bronze containing 20 per cent lead. With temperature control achieved by means of the Airtemp unit, the work pieces are easily held to tolerances of 0.005-in. inside and outside; 0.001-in. concentricity; and 0.001-in. squareness of the flange with the bore. Before the installation of the liquid cooler unit, these tolerances could not be held because of

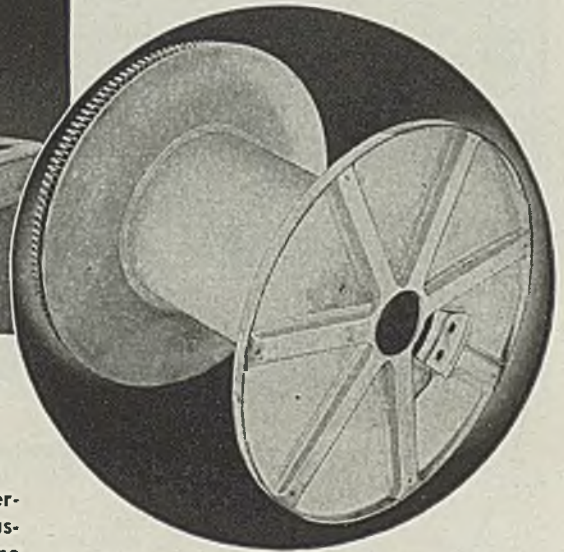
*They*  
**CALLED BRANDT FOR  
 PRECISION  
 METAL WORK**

# for WELDMENTS



*A 3500 lb Weldment*

*32 lb Weldment-Below*



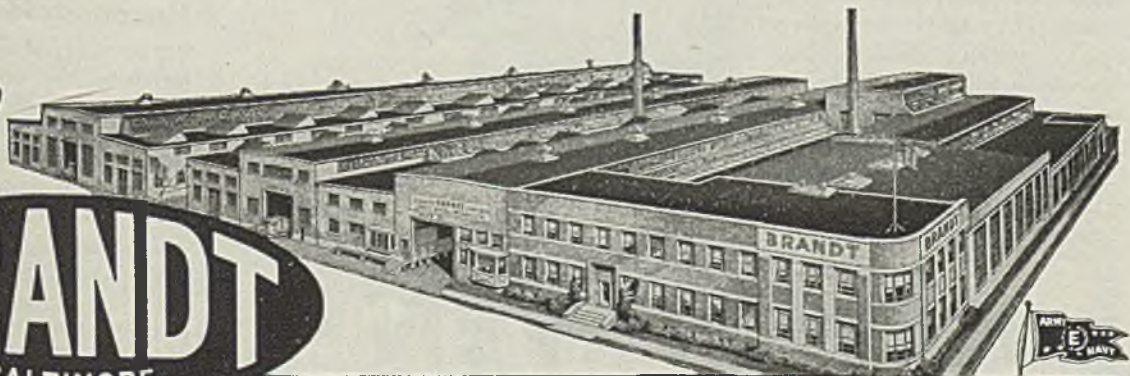
## Ranging from 32 lbs. to 3500 lbs.

The extreme differences in size of these two jobs made no difference in the PRECISION FINISH demanded by both Brandt customers. Besides precision welding to ordnance standards, these jobs involved: radiograph cutting, forming, heat treating and sand blasting. Heavy weldments to precision finish on all type metals and alloys is one of our specialties. Other Brandt services are: spot welding, fabricating, shearing, rolling and stamping.

Proximity to steel mills and to both rail and water transportation assures quick delivery. The same engineering skill that won the coveted Army-Navy "E" award six times is at your service. Whether your metal working needs are large or small . . . call BRANDT.

*Specialized*  
**STAMPINGS**  
**ASSEMBLIES**  
**PLATE FABRICATION**

*Call*  
**BRANDT**  
 BALTIMORE

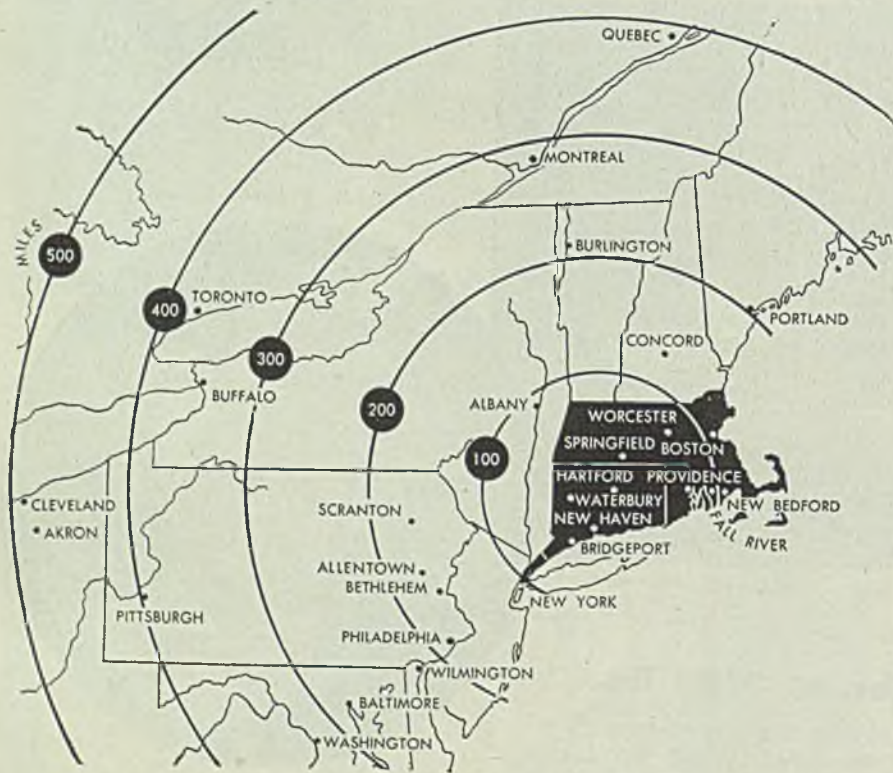


CHARLES T. BRANDT, INC., 1700 RIDGELY ST., BALTIMORE-30, MD.



*Precision* METAL CRAFTSMEN SINCE 1890 ★ ★ ★ ★

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Within this same 500 mile radius live 58,317,815 people with the highest potential buying power in the world. One indication of the sales opportunities which exist here is the fact that the U. S. portion of this fertile market paid 50% of all income taxes received by our Federal Government.

Easy access to millions of people with money to spend is one of many factors

in your favor when you locate your industry in Southern New England.

For a complete, factual resume of all advantages, write for the new 32-page booklet, "SOUTHERN NEW ENGLAND FOR TOMORROW'S INDUSTRY." Address: P. E. Benjamin, Mgr., Industrial Development, New Haven R. R., Room 201N, 80 Federal Street, Boston 10, Mass.

## THE **NEW HAVEN** R. R.

SERVING NEW YORK AND THE GREAT INDUSTRIAL STATES OF MASSACHUSETTS, RHODE ISLAND AND CONNECTICUT

varying cutting oil temperatures.

At this same company, a similar unit was installed to control the cutting oil temperature of a W. F. and John Barnes 6-spindle boring mill, and two 20 ft Fay automatic lathes for rough boring high tensile iron sleeves. It was found that the capacity of PL-300 was adequate for the three machines because when the 6-spindle boring mill was in operation, the two lathes were not used—and conversely, when the lathes were in operation the 6-spindle boring mill was not used. Here too the cooler helped establish better control of tolerance. In addition, increased tool life and increased speed of roughing were realized.

### Case Hardening Steel

(Concluded from Page 100)

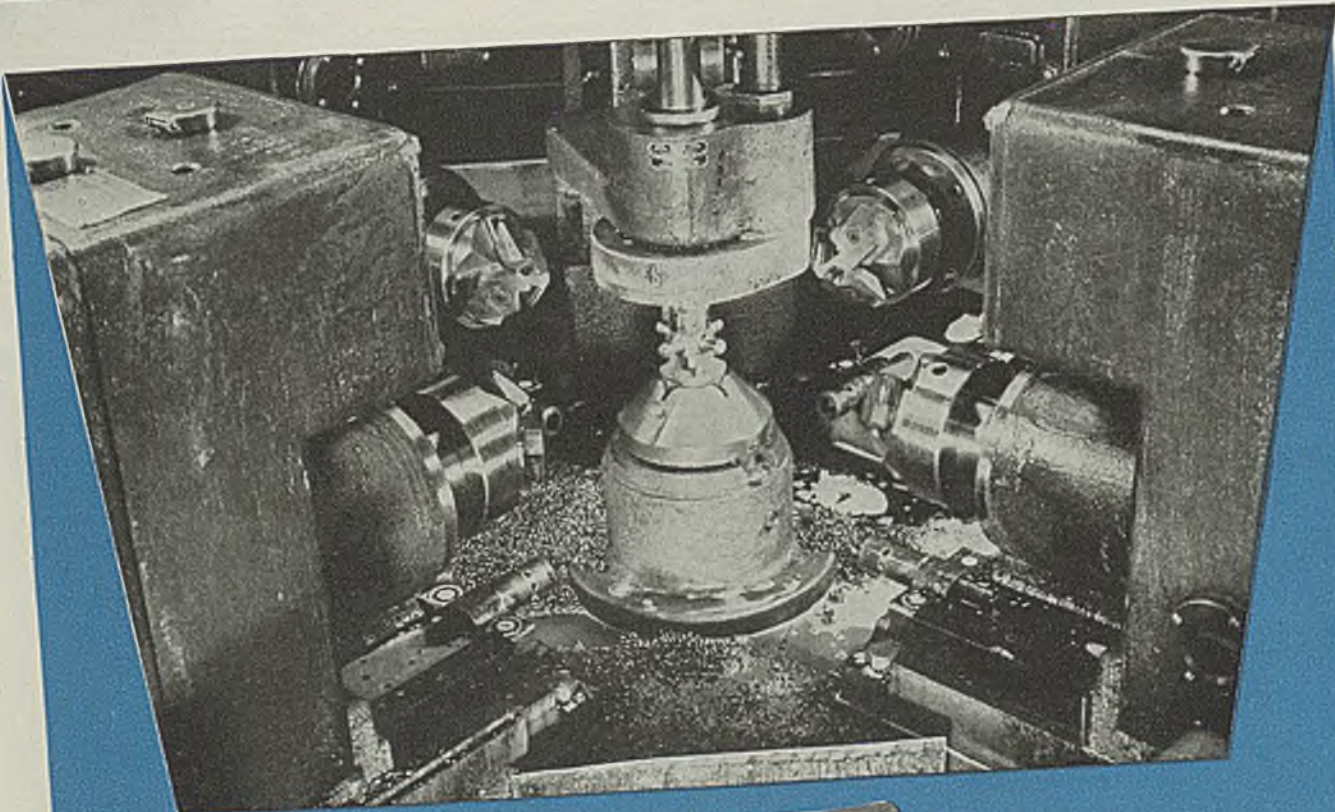
slowly enough to prevent over-heating of the surface and consequent distortion of thin or irregular-shaped pieces. The fused compound, maintained at uniform temperature by convection currents, supplies heat evenly to all surfaces of the steel treated. As the total mass is small, it absorbs or gives off heat quickly. This makes it possible to control accurately length of time metals under treatment are at heat. Parts are quenched in oil, water or solution, and may be required by the analysis of the metal or design of the piece. Parts emerge from the quench absolutely free from scale or dirt, and with a bright silvery finish.

No special furnace equipment is needed for the process. The operation is carried out in any properly fired pot type furnace. The furnace should be equipped with a pyrometer, and preferably with an automatic temperature control. Quenching tanks and usual auxiliary apparatus used in ordinary heat treating fulfill the requirements. The only special equipment necessary is the Chapmanizer. This apparatus, built by Chapman, is installed on a contract agreement.

### Seamless Tubing Handbooks Offered

Two technical handbooks and a booklet of master weight tables for steel tubing are being offered, free of charge, by Ohio Seamless Tube Co., Shelby, O. Handbook No. M-1, covering mechanical tubing, contains definitions, classifications by use, analyses, tolerances and machining and testing procedures.

Facts concerning tolerances, size range, specifications, uses, machining, and heat treating of aircraft tubing are covered in booklet No. A-2. Weight tables booklet includes dimensions and weights of pipe sizes, in addition to tables for square, rectangular, hexagonal and octagonal tubing.



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Forming cuts are taken on all four arms of this differential trunion—*simultaneously*—to produce 225 pieces per hour. That's *production!*

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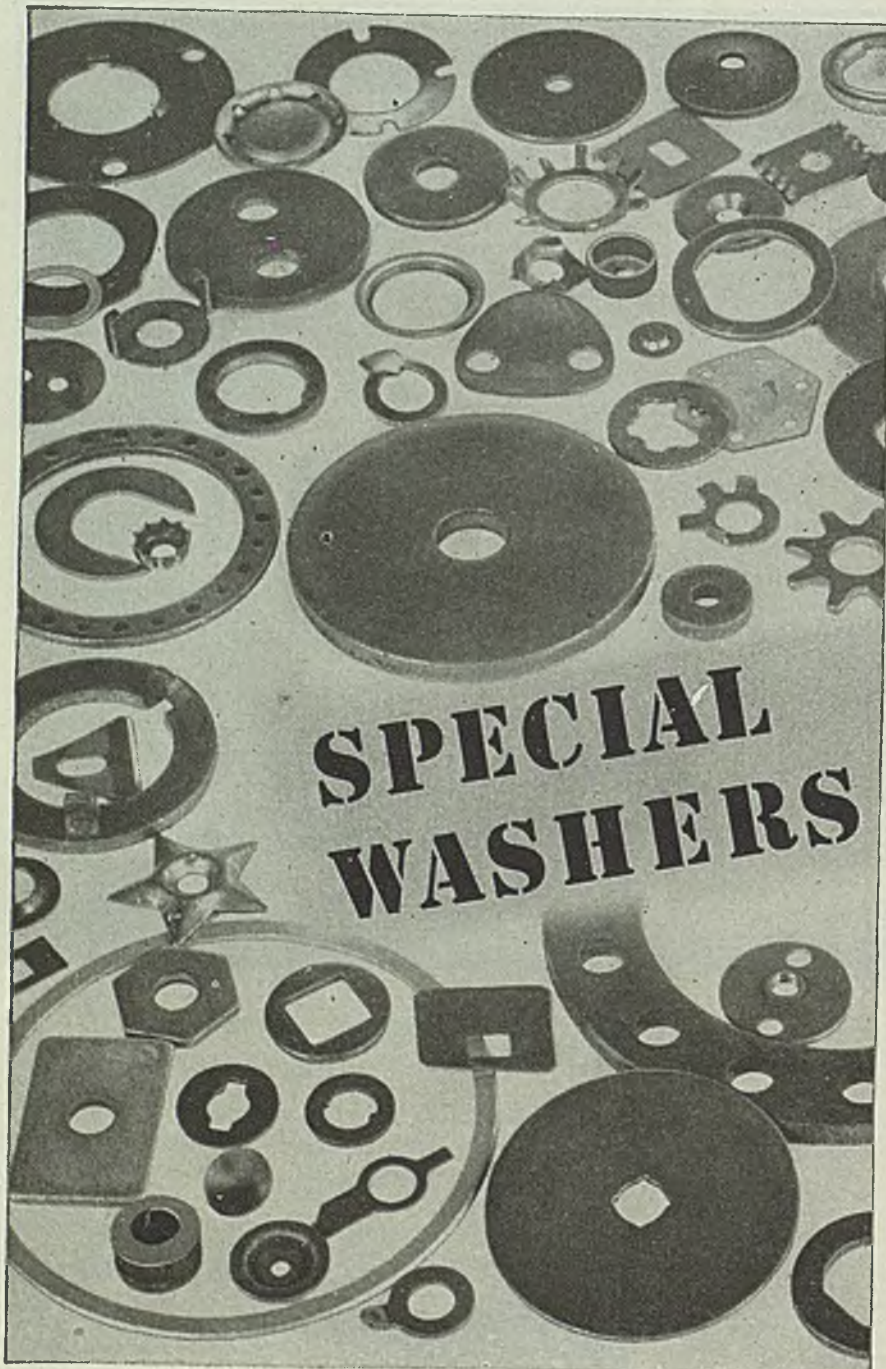


\*Vers-o-tools are heads, either revolving or stationary, self-opening or hand-operated, that hold circular thread chasers or circular cutters to the work. They are built in a wide variety of sizes and types, and—as the name implies—are extremely versatile in application to many different types of jobs through the use of interchangeable chasers or cutters.

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6400 PARK AVENUE • CLEVELAND 5, OHIO

## Reducing Grain Growth

(Concluded from Page 101)

the sealer is to prevent oxidation of the aluminum, giving it time to be absorbed into the iron or steel. Eventually oxidation takes place as the sealer burns through.

The final coating consists of an external surface of aluminum oxide and under this a coating of aluminum in solid solution in the iron. The concentration of aluminum near the surface is relatively high. Upon conclusion of heat treating, the article is wire-brushed and has a dull silvery appearance.

The following concerns the test conducted by the Canadian laboratory. Cast iron for the experiments was made with the following composition:

Carbon	.....	3.42 per cent
Manganese	.....	0.61
Silicon	.....	2.41
Sulphur	.....	0.08
Phosphorus	.....	0.55

Growth test specimens were prepared and ground to 2 in. in length and with a ½-in. square cross section. These samples were heated for 100 hours at various temperatures in an oxidizing atmosphere and their permanent growth recorded. Fig. 1 shows growth of unprotected samples after 100 hours at indicated temperature.

Of the standard growth test specimens, two were given the process No. 11 treatment and two were nickel plated. One of each of these specimens together with an unprotected sample was heated at 1600°F for 100 hours with the following results:

Sample	Permanent Growth
Unprotected	..... 7.5 per cent
Nickel Plated	..... 5.4
Metcolized	..... 2.5

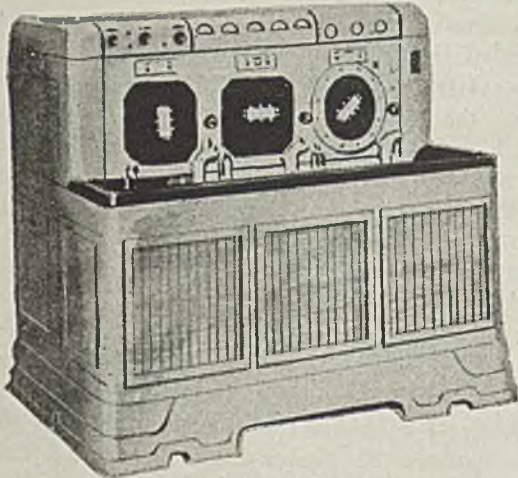
It was the intention of the laboratory to repeat the above test using a processed and an unprotected sample. Instead of a 100 hour test, exposure was to be for a longer time at the same 1600°F temperature. The automatic temperature control failed to operate properly shortly after beginning the test allowing the temperature to rise to an unknown figure above 1800°F. Samples were in this temperature for approximately 20 hours. The top sample in Fig. 2 is shown to be almost completely decomposed after this test. It was unprotected against growth. The bottom Metcolized sample retained its shape.

Conclusions drawn from these experiments show that this process will reduce growth of cast iron approximately 66 per cent. It has also been found to provide a considerable margin of safety against accidental exposure to higher temperatures.

**FOR A  
BETTER JOB**

**MODERN**

**INDUCTION HARDENERS**



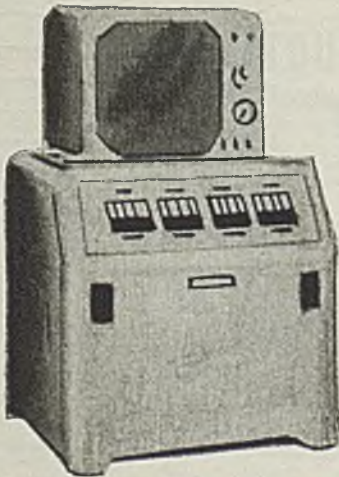
A large number of TOCCO induction heating furnaces, used and unused, are now available for immediate sale. These are late developments in controlled surface hardening by high frequency induction. The furnaces are designed to give selective and uniform hardening—cut costs—boost output—save space—fit easily into your production line.

It will definitely pay you to consider the use of this equipment for your surface hardening requirements. All items subject to prior sale.

**SPECIFICATIONS:**

9600 cycles; 1, 2, or 3 station 220/440 volt, 3-phase, 60 cycle, range 7½ to 125 KW; and 200 KW machines at 3000 cycles.

**MADE BY TOCCO  
PRICED FOR QUICK SALE**



Although this material has previously been offered to priority claimants, 10 per cent of the merchandise has been reserved to fulfill any further needs of priority claimants including **VETERANS OF WORLD WAR II** who are invited to contact the Regional Office serving their area.

Use this coupon to obtain complete information on the machine you want. Simply mail it to your nearest W.A.A. Regional Office.

**TO WAR ASSETS ADMINISTRATION:**

Please send me, without obligation, full information on the price, location and condition of Induction Heating Equipment of the following types:

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 Name .....

Firm .....

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City..... State.....

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# The Business Trend

## Industrial Activity Sets New Postwar Records

OCTOBER set a new postwar record for both a weekly high mark and a sustained high rate of industrial production, but whether these levels can be exceeded or even equaled again this year depends to a large degree on the success of negotiations between the government and John L. Lewis and his United Mine Workers.

An interruption in bituminous coal production would soon be reflected in curtailed industrial operations, for stockpiles which were depleted during the miners' strike in April and May of this year have not been built up to normal. However, soft coal output has been at a high level since the two-month strike. Production of 12½ million tons in the week ended Oct. 19 helped boost this year's accumulated output to that date to within 7.2 per cent of the output for the corresponding period of last year.

October's sustained high rate of activity, as measured on STEEL's industrial production index, averaged 154 per cent of the 1936-1939 average of 100 per cent. The previous postwar record months were August, when the average was 150.75 per cent, and September, with an average of 149 per cent. The postwar weekly peak was 155 per cent in the week ended Oct. 19. Rate for the week ended Oct. 26 was 154 per cent (preliminary), the decline resulting partly from reduced auto output.

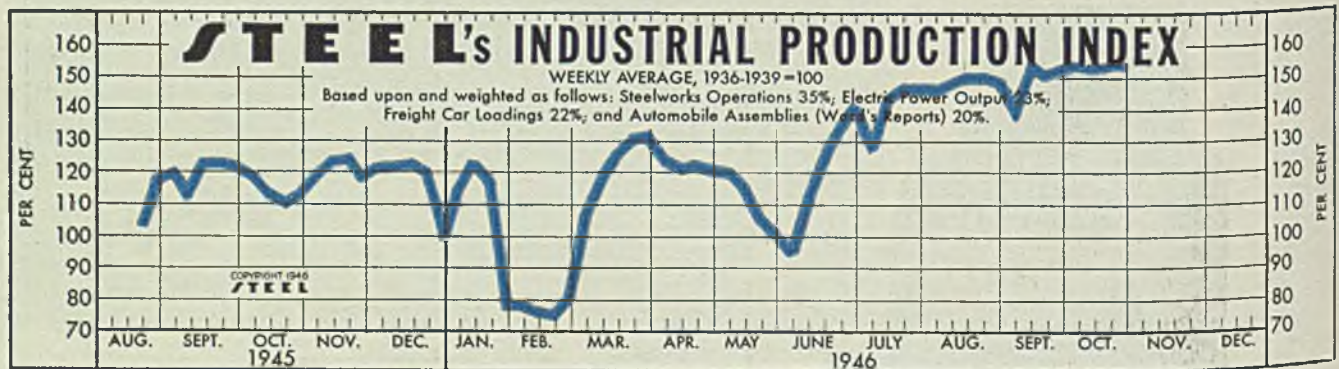
**STEEL**—Steel ingot production has been holding steadily for the last eight weeks at approximately 90 per cent of capacity, but demand is so strong that the situation with respect to light flat-rolled products continues particularly acute.

**AUTOMOBILES**—Reflecting the light steel situation was a decline in automobile production to 87,240 passenger cars, trucks, and busses in the week ended Oct. 26. The preceding week's output had been 89,540.

**ELECTRICITY**—Electric power output which has been at a high level since mid-July attained a new postwar peak of 4,601,767,000 kilowatthours in the week ended Oct. 26. This was the highest weekly production since the week ended Jan. 27, 1945.

**CAR LOADINGS**—Loading of 931,766 cars of revenue freight in the week ended Oct. 19 not only set a new postwar high but exceeded even the greatest weekly loadings during the busy war period. This was an increase of 32,323 cars over the preceding week. A third of this increase came from miscellaneous freight loadings. Also contributing substantially to the increase was a rise in livestock loadings.

**OUTLOOK**—Although many measuring sticks of industrial activity are currently at high levels, industrial purchasing agents, who for some time generally anticipated better business conditions, now indicate an expectation of lower business. Shutdowns due to strikes and materials shortages are seriously affecting the pay-income of industrial workers, and a drop in buyers' and consumers' demands is bound to result, the purchasing agents say.



The Index (see chart above): Latest Week (preliminary) 154 Previous Week 155 Month Ago 153

### FIGURES THIS WEEK

#### INDUSTRY

	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	90	90.5	90.5	65
Electric Power Distributed (million kilowatt hours)	4,602	4,540	4,518	3,937
Bituminous Coal Production (daily av.—1000 tons)	2,033	2,033	2,056	991
Petroleum Production (daily av.—1000 bbls.)	4,730	4,733	4,777	4,273
Construction Volume (ENR—Unit \$1,000,000)	\$55.2	\$108.2	\$84.1	\$58.4
Automobile and Truck Output (Ward's—number units)	87,240	89,540	85,495	20,675

\* Dates on request. † 1946 weekly capacity is 1,762,381 net tons. 1945 weekly capacity was 1,831,636 net tons.

#### TRADE

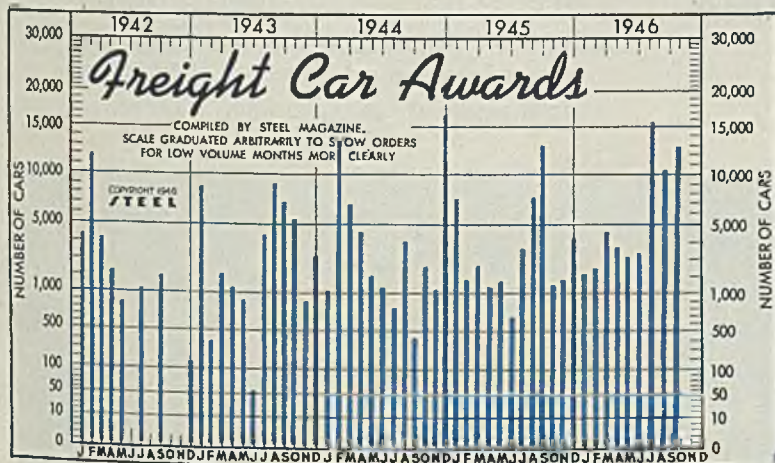
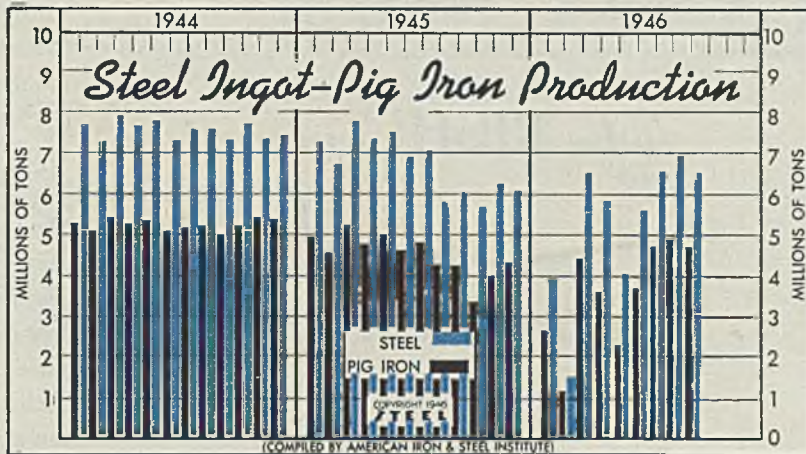
Freight Carloadings (unit—1000 cars)	920†	932	916	855
Business Failures (Dun & Bradstreet, number)	33	23	28	17
Money in Circulation (in millions of dollars)†	\$28,585	\$28,597	\$28,448	\$27,974
Department Store Sales (change from like week a year ago)†	+24%	+15%	+27%	+18%

† Preliminary. † Federal Reserve Board.



**Iron, Steel Production**  
(Net Tons—000 omitted)

	Steel Ingots			Pig Iron	
	1946	1945	1944	1946	1945
Jan. ....	3,872	7,206	7,593	2,645	4,945
Feb. ....	1,393	6,655	7,194	1,148	4,563
Mar. ....	6,507	7,708	7,326	4,424	5,228
Apr. ....	5,860	7,292	7,594	3,614	4,786
May ....	4,072	7,452	7,703	2,275	5,016
June ....	5,624	6,842	7,234	3,682	4,605
July ....	6,610	6,987	7,498	4,705	4,812
Aug. ....	6,887	5,736	7,499	4,598	4,219
Sept. ....	6,517	5,983	7,235	4,687	4,227
Oct. ....	.....	5,598	7,621	.....	3,388
Nov. ....	.....	6,201	7,279	.....	4,026
Dec. ....	.....	6,059	7,366	.....	4,323
Total .....	79,719	89,642	.....	54,167	.....



**Freight Car Awards**

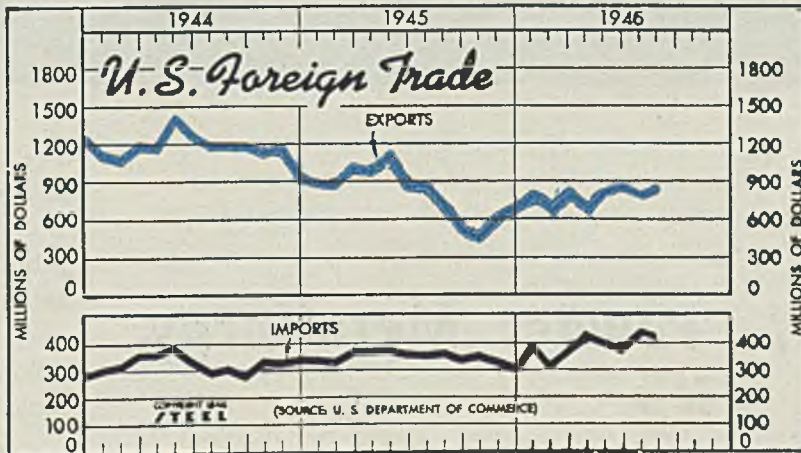
	*1946	1945	1944	1943
Jan. ....	2,050	7,200	1,020	8,365
Feb. ....	2,403	1,750	13,240	850
Mar. ....	4,516	2,500	6,510	1,935
Apr. ....	8,764	1,120	4,519	1,000
May ....	8,025	1,526	1,952	870
June ....	8,334	670	1,150	50
July ....	15,236	3,500	795	4,190
Aug. ....	9,530	7,240	3,900	8,747
Sept. ....	12,737	12,840	400	6,820
Oct. ....	.....	1,320	2,425	5,258
Nov. ....	.....	1,650	1,065	870
Dec. ....	.....	4,116	16,245	2,919
Total .....	.....	45,432	53,221	41,374

\*American Railway Car Institute.

**Foreign Trade**  
Bureau of Foreign and Domestic Commerce

(Unit Value—\$1,000,000)

	Exports			Imports		
	1946	1945	1944	1946	1945	1944
Jan. ....	800	901	1,124	398	334	300
Feb. ....	671	882	1,086	318	324	313
Mar. ....	815	1,030	1,197	384	365	359
Apr. ....	758	1,002	1,182	406	366	359
May ....	851	1,133	1,419	397	372	386
June ....	878	866	1,271	385	360	330
July ....	826	893	1,198	432	356	293
Aug. ....	881	737	1,207	424	360	302
Sept. ....	.....	515	1,199	.....	335	280
Oct. ....	.....	455	1,140	.....	344	327
Nov. ....	.....	639	1,184	.....	322	322
Dec. ....	.....	736	934	.....	297	336
Total .....	9,786	14,141	.....	4,135	3,907	.....



**FINANCE**

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions).....	\$12,862	\$11,482	\$12,425	\$11,413
Federal Gross Debt (billions).....	\$263.7	\$263.7	\$265.6	\$262.0
Bond Volume, NYSE (millions).....	\$19.8	\$27.3	\$35.4	\$28.9
Stocks Sales, NYSE (thousands).....	4,715	7,839	8,422	6,403
Loans and Investments (billions)†.....	\$58.3	\$58.2	\$59.4	\$61.1
United States Gov't. Obligations Held (millions)†.....	\$39,230	\$39,187	\$40,525	\$45,471

† Member banks, Federal Reserve System.

**PRICES**

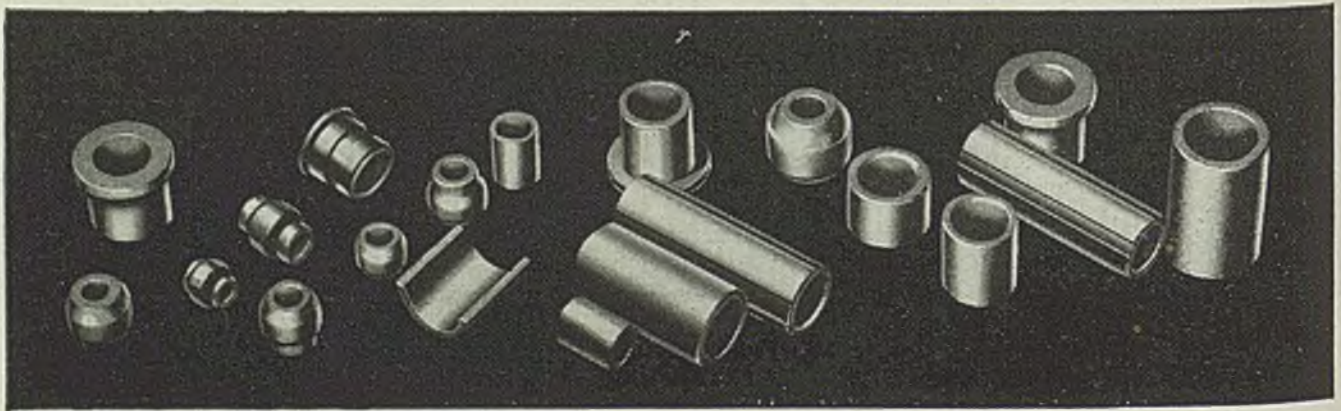
	Latest Period*	Prior Week	Month Ago	Year Ago
STEEL's composite finished steel price average.....	\$64.45	\$64.45	\$64.45	\$58.27
All Commodities†.....	135.1	126.0	123.8	105.5
Industrial Raw Materials†.....	146.3	146.3	142.5	116.9
Manufactured Products†.....	133.7	118.6	117.1	101.9

† Bureau of Labor Statistics Index, 1926=100.

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SLEEVE BEARING HEADQUARTERS

**BRANCHES IN  
18 INDUSTRIAL  
CENTERS**

## Decontrol Ordered by OPA On Several Steel Products

*Little price change expected on freed items . . .*

*More producers opening first quarter books . . .*

*Relighted stacks to ease pig iron supply*

DECONTROL of alloy steels and tubing, iron ore shipped after Jan. 1, 1947, steel wire rope and strand, alloy tool steel rolled products and alloy specialty steels is among latest developments in restoration of the steel market to a normal status. While producers have not committed themselves it is the general trade expectation there will be little, if any, change in existing prices. Expectation that prices will remain steady on the alloys and wire rope is furthered by the fact that these products are under no particular pressure now.

Another recent development is action by a leading steel producer in setting up first quarter quotas on its general line of products, including sheets and strip, concerning which there has been considerable delay among sellers in formulating first quarter schedules. Heavy arrearages, combined with continued receipt of rated tonnages for early rolling, have been the major factors in this delay. At least one other large sheet and strip producer is expected to set up quotas for first quarter soon.

Shape producers are expected to get operations up this month to the unusually high level of almost 400,000 tons and one large interest plans being fully caught up on arrearages within two weeks. Some others are less fortunate, claiming they will not reach such balance until at least some time in first quarter. However, the overall situation in shapes is easing, due to steady decline in structural work over recent weeks because of CPA limitations on nonhousing work, rapidly mounting costs, particularly for labor and a less favorable business outlook in general. Various building programs have been reduced or delayed indefinitely, with some important cancellations. Nevertheless,

most shape mills and fabricators have good backlogs and some scattered projects of good size are being let. Demand continues strong for smaller shapes, three and six inches, for prefabricated housing and equipment assemblies.

Strong foreign demand for steel exists, of which a relatively small portion is being met in the four-month program getting under way this month, with government directives for all products covering more than 200,000 tons. Pressure of domestic requirements has caused steelmakers to bypass much export demand since the end of the war and this has included a large number of items. Next year mills are likely to give more attention to exports.

Scrap and pig iron shortage persists, movement of the former being limited by reluctance of yard dealers to collect and process material at the differential now allowed. Little hope of betterment is held unless higher prices are allowed. The pig iron situation promises some improvement with relighting of idle furnaces which will be paid premiums of \$8 to \$12 per ton for iron for the housing program.

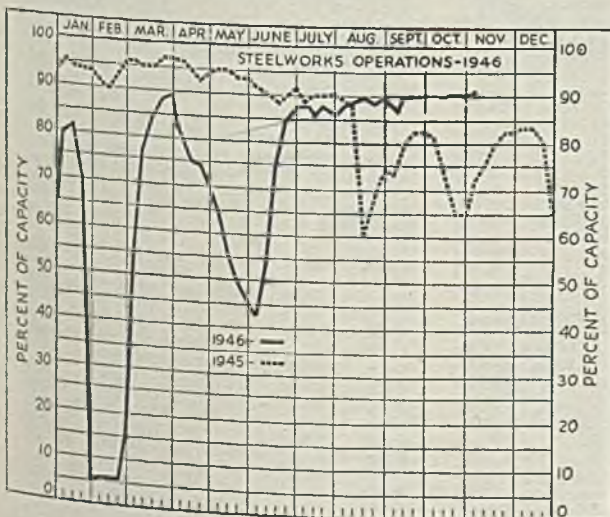
Estimated steelworks operations last week gained 1 point to 91 per cent of capacity. This was caused mainly by a rise of 1 point at both Pittsburgh and Chicago and recovery of 23 points at Cleveland, where a strike was settled after a week's idleness. Chicago rose 1 point to 92½ per cent, Pittsburgh 1 point to 98½, Cleveland 23 points to 89, Cincinnati 4 points to 88, St. Louis 4½ points to 65½ and New England 1 point to 90. Wheeling lost 12½ points to 81½ and Detroit 1 point to 91. Other districts were unchanged as follows: Youngstown 91, eastern Pennsylvania 78, Buffalo 88½, Birmingham 99 and West Coast 84.

Average composite prices for steel and iron products are unchanged in absence of alterations in OPA ceilings. Finished steel composite remains at \$64.45, semifinished steel at \$40.60, steelmaking pig iron at \$27.50 and steelmaking scrap \$17.17.

### DISTRICT STEEL RATES

	Percentage of Ingot Capacity Engaged in Leading Districts		Same Week	
	Week Ended Nov. 2	Change	1945	1944
Pittsburgh . . . . .	98.5	+ 1	72.5	91.5
Chicago . . . . .	92.5	+ 1	73.5	99
Eastern Pa. . . . .	91	None	74	94.5
Youngstown . . . . .	91	None	54	88
Wheeling . . . . .	81.5	-12.5	86.5	91
Cleveland . . . . .	89	+23	83	95.5
Buffalo . . . . .	88.5	None	81.5	72
Birmingham . . . . .	99	None	95	90
New England . . . . .	90	+ 1	80	86
Cincinnati . . . . .	88	+ 4	71	89
St. Louis . . . . .	65.5	+ 4.5	68	75
Detroit . . . . .	91	- 1	92	88
Estimated national rate . . . . .	91	+ 1	73	95.5

Based on weekly steelmaking capacity of 1,762,381 net tons for 1946; 1,831,636 tons for 1945; 1,791,287 tons for 1944.



# COMPOSITE MARKET AVERAGES

	Nov. 2	Oct. 26	Oct. 19	One Month Ago Oct., 1946	Three Months Ago Aug., 1946	One Year Ago Nov., 1945	Five Years Ago Nov., 1941
Finished Steel	\$64.45	\$64.45	\$64.45	\$64.45	\$64.45	\$58.27	\$56.73
Semifinished Steel	40.60	40.60	40.60	40.60	40.60	37.80	36.00
Steelmaking Pig Iron	27.50	27.50	27.50	27.50	27.50	24.75	23.00
Steelmaking Scrap	19.17	19.17	19.17	19.17	19.17	19.17	19.17

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, 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. Finished steel, net tons; others, gross tons.

## COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others, dollars per gross ton.

### Finished Material

	Nov. 2 1946	Oct., 1946	Aug., 1946	Nov., 1945
Steel bars, Pittsburgh	2.50c	2.50c	2.50c	2.25c
Steel bars, Philadelphia	2.86	2.86	2.86	2.57
Steel bars, Chicago	2.50	2.50	2.50	2.25
Shapes, Pittsburgh	2.35	2.35	2.35	2.10
Shapes, Philadelphia	2.48	2.48	2.48	2.215
Shapes, Chicago	2.35	2.35	2.35	2.10
Plates, Pittsburgh	2.50	2.50	2.50	2.25
Plates, Philadelphia	2.558	2.558	2.558	2.30
Plates, Chicago	2.50	2.50	2.50	2.25
Sheets, hot rolled, Pittsburgh	2.425	2.425	2.425	2.20
Sheets, cold-rolled, Pittsburgh	3.275	3.275	3.275	3.05
Sheets, No. 24 galv., Pittsburgh	4.05	4.05	4.05	3.70
Sheets, hot-rolled, Gary	2.425	2.425	2.425	2.20
Sheets, cold-rolled, Gary	3.275	3.275	3.275	3.05
Sheets, No. 24 galv., Gary	4.05	4.05	4.05	3.70
Hot-rolled strip, over 6 to 12-in., Pitts.	2.35	2.35	2.35	2.10
Cold-rolled strip, Pittsburgh	3.05	3.05	3.05	2.80
Bright basic, bess. wire, Pittsburgh	3.05	3.05	3.05	2.75
Wire nails, Pittsburgh	3.75	3.75	3.75	2.90
Tin plate, per base box, Pittsburgh	\$5.25	\$5.25	\$5.25	\$5.00

### Pig Iron

	Nov. 2 1946	Oct., 1946	Aug., 1946	Nov., 1945
Bessemer del. Pittsburgh	\$29.77	\$29.77	\$29.77	\$26.94
Basic, Valley	28.00	28.00	28.00	25.25
Basic, eastern del. Philadelphia	29.93	29.93	29.93	27.09
No. 2 fdry., del. Pgh. N. & S. sides	29.27	29.27	29.27	26.44
No. 2 fdry., del. Philadelphia	30.43	30.43	30.43	27.59
No. 2 foundry, Chicago	28.50	28.50	28.50	25.75
Southern No. 2, Birmingham	24.88	24.88	24.88	22.13
Southern No. 2, del. Cincinnati	28.94	28.94	28.94	26.08
Malleable, Valley	28.50	28.50	28.50	25.75
Malleable, Chicago	28.50	28.50	28.50	25.75
Charcoal, low phos., fob Lyles, Tenn.	33.00	33.00	33.00	33.00
Gray forge, del. McKees Rocks, Pa.	28.61	28.61	28.61	25.50
Ferromanganese, fob cars, Pittsburgh	140.00	140.00	140.00	140.00

### Scrap

	Nov. 2 1946	Oct., 1946	Aug., 1946	Nov., 1945
Heavy melting steel, No. 1, Pittsburgh	\$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	25.00	25.00	25.00	25.00

### Coke

	Nov. 2 1946	Oct., 1946	Aug., 1946	Nov., 1945
Connellsville, furnace ovens	\$8.75	\$8.75	\$8.75	\$7.50
Connellsville, foundry ovens	9.50	9.50	9.50	8.25
Chicago, by-product fdry., del.	15.10	15.10	15.10	13.75

### Semifinished Material

	Nov. 2 1946	Oct., 1946	Aug., 1946	Nov., 1945
Sheet bars, Pittsburgh, Chicago	\$38.00	\$38.00	\$38.00	\$36.00
Slabs, Pittsburgh, Chicago	39.00	39.00	39.00	36.00
Revoling billets, Pittsburgh	39.00	39.00	39.00	36.00
Wire rods, No. 5 to 3/8-inch, Pitts.	2.90c	2.90c	2.90c	2.15c

## STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Delivered prices do not include the 3 per cent federal tax on freight. Pricing on rails was changed to net ton basis as of Feb. 15, 1946.

### Semifinished Steel

**Carbon Steel Ingots:** Rerolling quality, standard analysis, \$33, fob mill; forging quality, \$38, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

**Alloy Steel Ingots:** Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, Coatesville, uncrop, \$48.69.

**Revoling, Billets, Blooms, Slabs:** Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, \$39; Detroit, del., \$41.50; Duluth (billets), \$41; Pac. ports (billets), \$51.50 (Andrews Steel Co., carbon slabs, \$41; Northwestern Steel & Wire Co., \$41, Sterling, Ill.; Granite City Steel Co., \$47.50 gross ton slabs from D.P.C. mill, Geneva Steel Co., \$58.64, Pac. ports.)

**Forging Quality Blooms, Slabs, Billets:** Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, \$47; Detroit, del., \$49.50; Duluth, billets, \$49; forging billets fob Pac. ports, \$59.50.

(Andrews Steel Co. may quote carbon forging billets \$50 gross ton at established basing point s; Fullansbee Steel Corp., \$49.50 fob Toronto, O.; Geneva Steel Co., \$64.64, Pacific ports.)

**Alloy Billets, Slabs, Blooms:** Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, \$58.43; del. Detroit \$60.93; eastern Mich. \$61.93.

**Sheet Bars:** Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, \$38 (Empire Sheet & Tin Plate Co., Mansfield, O., carbon, sheet bars, \$39, fob mill.)

**Skelp:** Pittsburgh, Chicago, Sparrows Point, Youngstown, Coatesville, lb, 2.05c.

**Wire Rods:** Pittsburgh, Chicago, Cleveland, Birmingham, No. 5—3/8 in. inclusive, per 100 lb, \$2.30. Do., over 3/8—1 1/8 in. incl., \$2.45; Galveston, base, \$2.40 and \$2.55, respectively. Worcester add \$0.10; Pacific ports \$0.535.

### Bars

**Hot-Rolled Carbon Bars and Bar-Size Shapes under 3-in.:** Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham base, 20 tons one size, 2.50c; Duluth, base, 2.60c; Detroit, del., 2.635c; eastern Mich., 2.685c; New York, del., 2.88c; Phila., del., 2.86c; Gulf ports, dock, 2.885c; Pac. ports, dock, 3.185c (Sheffield Steel Corp. may quote 2.75c, fob St. Louis; Joslyn Mfg. & Supply Co., 2.55c, fob Chicago.)

**Rail Steel Bars:** Same prices as for hot-rolled carbon bars except base is 5 tons.

**Hot-Rolled Alloy Bars:** Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 2.921c; Detroit, del., 3.056c. (Texas Steel Co. may use Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

Series	(*Basic O-H)	Series	(*Basic O-H)
1300	\$0.108	4300	\$1.839
2300	1.839	4600	1.298
2500	2.759	4800	2.326
2900	0.541	5100	0.379
3100	0.920	5130 or 5152	0.494
3200	1.461	6120 or 6152	1.028
3400	3.462	6145 or 6150	1.298
4000	0.487	8612	0.703
4100 (15-25 Mo)	0.757	8720	0.757
(20-30 Mo)	0.812	9830	1.407

\* Add 0.25 for acid open-hearth; 0.50 electric.

**Cold-Finished Carbon Bars:** Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 20,000-39,999 lb, 3.10c; Detroit, 3.15c; Toledo, 3.25c.

**Cold-Finished Alloy Bars:** Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 3.625c; Detroit, del., 3.76c; eastern Mich., 3.79c.

**Reinforcing Bars (New Billet):** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.35c; Detroit, del., 2.485c; eastern Mich. and Toledo,

2.535c; Gulf ports, dock, 2.735c; Pacific ports, dock 2.785c.

**Reinforcing Bars (Rail Steel):** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo, base, 2.35c; Detroit, del., 2.485c; eastern Mich. and Toledo, del., 2.535c; Gulf ports, dock, 2.735c.

**Iron Bars:** Single refined, Pitts., 4.76c; double refined, 5.84c; Pittsburgh, staybolt, 6.22c; Terre Haute, single ref., 5.42c; double ref., 6.76c.

### Sheets, Strip

**Hot-Rolled Sheets:** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Pt., Middletown, base, 2.425c; Granite City, base, 2.525c; Detroit, del., 2.56c; eastern Mich., del., 2.61c; Phila., del., 2.615c; New York, del., 2.685c; Pacific ports, 3.01c (Andrews Steel Co. may quote hot-rolled sheets for shipment to the Detroit area on the Midland, O., base; Alan Wood Steel Co., Conshohocken, Pa., may quote 3.00c on hot carbon sheets, Sparrows Point, Md.)

**Cold-Rolled Sheets:** Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.275c; Granite City, base, 3.375c; Detroit, del., 3.41c; eastern Mich., del., 3.46c; New York, del., 3.615c; Phila., del., 3.635c; Pacific ports, 3.96c.

**Galvanized Sheets, No. 24:** Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base, 4.05c; Granite City, base, 4.15c; New York, del., 4.31c; Phila., del., 4.24c; Pacific ports, 4.635c.

**Corrugated Galv. Sheets:** Pittsburgh, Chicago, Gary, Birmingham, 29-gage, per square, 3.73c.

**Culvert Sheets:** Pittsburgh, Chicago, Gary, Birmingham, 16-gage not corrugated, copper alloy, 4.15c; Granite City, 4.25c; Pacific ports, 4.635c; copper iron, 4.50c; pure iron, 4.50c; zinc-coated, hot-dipped, heat-treated, No. 24 Pittsburgh, 4.60c.

**Aluminized Sheets, 20 gage:** Pittsburgh, hot-dipped, coils or cut to lengths 9.00c.

**Enameling Sheets:** 10-gage; Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base 3.20c; Granite City, base 3.30c; Detroit, del., 3.35c; eastern Mich., 3.38c; Pacific ports, 3.88c; 20-gage: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base, 3.80c; Detroit, del., 3.93c; eastern Mich., 3.98c; Pacific ports, 4.48c.

**Electrical Sheets No. 24:**

	Pittsburgh	Pacific	Granite
	Base	Ports	City
Field grade	3.90c	4.685c	4.00c
Armature	4.25c	5.035c	4.35c
Electrical	4.75c	5.535c	4.85c
Motor	5.425c	6.21c	5.525c
Dynamo	6.125c	6.91c	6.225c
Transformer			
72	6.625c	7.41c	
65	7.625c	8.41c	
58	8.125c	8.91c	
52	8.925c	9.71c	

**Hot-Rolled Strip:** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Middletown, 6-in. and narrower: Base, 2.45c; Detroit, del., 2.585c; eastern Mich., del., 2.635c; Pacific ports, 3.135c. (Superior Steel Corp. may quote 3.30c, Pitts.)

Over 6-in.: Base, 2.35c; Detroit, del., 2.485c; eastern Mich., del., 2.535c; Pacific ports, 3.035c. (Superior Steel Corp. may quote 3.20c, Pitts.)

**Cold-Rolled Strip:** Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less, 3.05c; Chicago, base, 3.15c; Detroit, del., 3.185c; eastern Mich., del., 3.235c; Worcester, base, 3.25c. (Superior Steel Corp. may quote 4.70c, Pitts.)

**Cold-Finished Spring Steel:** Pittsburgh, Cleveland base, 0.26-0.50 carbon, 3.03c. Add 0.20c for Worcester.

**Tin, Terne Plate**

(OPA ceiling prices announced March 1, 1946.)

**Tin Plate:** Pittsburgh, Chicago, Gary, 100-lb base box, \$5.25; Granite City, Birmingham, Sparrows Point, \$5.35.

**Electrolytic Tin Plate:** Pittsburgh, Gary, 100-lb base box 0.25 lb tin, \$4.60; 0.50 lb tin, \$4.75; 0.75 lb tin, \$4.90; Granite City, Birmingham, Sparrows Point, \$4.70, \$4.85, \$5.00, respectively.

**Tin Mill Black Plate:** Pittsburgh, Chicago, Gary, base 29-gage and lighter, 3.30c; Granite City, Birmingham, Sparrows Point, 3.40c; Pacific ports, boxed, 4.335c.

**Long Ternes:** Pittsburgh, Chicago, Gary, No. 24 unassorted, 4.05c; Pacific ports, 4.835c.

**Manufacturing Ternes (Special Coated):** Pittsburgh, Chicago, Gary, 100-base box, \$4.55; Granite City, Birmingham, Sparrows Point, \$4.65.

**Roofing Ternes:** Pittsburgh base per package 112 sheets; 20 x 28 in., coating I. C. 8-lb \$12.50; 15-lb \$14.50; 20-lb \$15.50 (nom.); 40-lb \$20.00 (nom.).

**Plates**

**Carbon Steel Plates:** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, Coatesville, Claymont, 2.50c; Geneva, Utah, 2.65c; New York, del., 2.71c; Phila., del., 2.585c; St. Louis, del., 2.74c; Boston, del., 2.86c; Pacific ports, 3.085c; Gulf ports, 2.885c.

(Granite City Steel Co. may quote carbon plates 2.65c fob DPC mill; Central Iron & Steel Co., Harrisburg, Pa., 2.80c, basing points; Lukens Steel Co., Coatesville, Pa., 2.75c, base; Worth Steel Co., Claymont, Del., 2.60c, base; Alan Wood Steel Co., Conshohocken, Pa., 2.75c base.)

**Floor Plates:** Pittsburgh, Chicago, 3.75c; Pacific ports, 4.435c; Gulf ports, 4.135c.

**Open-Hearth Alloy Plates:** Pittsburgh, Chicago, Coatesville, 3.787c; Gulf ports, 4.308c; Pacific ports, 4.525c.

**Clad Steel Plates:** Coatesville, 10% cladding: nickel-clad, 18.72c; Inconel-clad, 26.00c; monel-clad, 24.96c.

**Shapes**

**Structural Shapes:** Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.35c; New York, del., 2.54c; Phila., del., 2.48c; Pacific ports, 3.035c; Gulf ports, 2.735c.

(Phoenix Iron Co., Phoenixville, Pa., may quote the equivalent of 2.60c. Bethlehem, Pa., on the general range and 2.70c on beams and channels from 4 to 10 inches.)

**Steel Piling:** Pittsburgh, Chicago, Buffalo, 2.65c; Pacific ports, 3.235c.

**Wire and Wire Products**

(Fob Pittsburgh, Chicago, Cleveland and Birmingham, per 100 pounds)

**Wire to Manufacturers in carloads**

Bright, basic or besselmer ..... \$3.05

Spring (except Birmingham) ..... \$4.00

**Wire Products to Trade**

Nails and staples

Standard and cement-coated ..... \$3.75

Galvanized ..... \$3.40

Wire Merchant Quality

Annealed ..... \$3.50

Galvanized ..... \$3.85

(Fob Pittsburgh, Chicago, Cleveland, Birmingham, per base column)

Woven fence, 15 1/2 gage and heavier... 72

Barbed wire, 80-rod spool ..... \*\*79

Barless wire, twisted ..... \*\*79

Fence posts ..... 74

Bale ties, single loop ..... 72 1/2

\*Add \$0.10 for Worcester, \$0.05 for Duluth and \$0.535 for Pacific ports.

†Add \$0.30 for Worcester, \$0.535 for Pacific ports. Nichols Wire & Steel may quote \$4.25; Pittsburgh Steel Co., \$4.10.

‡Add \$0.535 for Pacific ports.

§Add \$0.10 for Worcester; \$0.735 Pacific ports.

\*\*Pittsburgh Steel Co. may quote 89.

**Tubular Goods**

**Welded Pipe:** Base price in carloads, threaded and coupled 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 Welded Steel						Iron					
In.	Blk.	Galv.	In.	Blk.	Galv.	In.	Blk.	Galv.	In.	Blk.	Galv.
3/4	53	30	3/4	21	0 1/2	1	27	7	1 1/4	31	13
1	56	37 1/2	1	27	7	1 1/2	31	13	1 3/4	35	15 1/2
1 1/4	60 1/2	45	1 1/4	31	13	1 3/4	35	15 1/2	1 3/4	35	15 1/2
1 1/2	63 1/2	52	1 1/2	35	15 1/2	1 3/4	35	15 1/2	1 3/4	35	15 1/2
1-3	65 1/2	54 1/2	1-3	34 1/2	15						

Lap Weld Steel						Iron					
In.	Blk.	Galv.	In.	Blk.	Galv.	In.	Blk.	Galv.	In.	Blk.	Galv.
2	58	46 1/2	2	20	0 1/2	2 1/2	48 1/2	2 1/2	27 1/2	9	
2 1/2	61	49 1/2	2 1/2	27 1/2	9	2 1/2	51 1/2	2 1/2	28 1/2	11 1/2	
3	63	51 1/2	3	28 1/2	11 1/2	2 1/2	54 1/2	2 1/2	30 1/2	15	
3 1/2	65	53 1/2	3 1/2	29 1/2	14	2 1/2	57 1/2	2 1/2	31 1/2	18	
4	67 1/2	55 1/2	4	30 1/2	18	2 1/2	60 1/2	2 1/2	32 1/2	21	
4 1/2	69 1/2	57 1/2	4 1/2	31 1/2	21	2 1/2	63 1/2	2 1/2	33 1/2	24	
5	71 1/2	59 1/2	5	32 1/2	24	2 1/2	66 1/2	2 1/2	34 1/2	27	
5 1/2	73 1/2	61 1/2	5 1/2	33 1/2	27	2 1/2	69 1/2	2 1/2	35 1/2	30	
6	75 1/2	63 1/2	6	34 1/2	30	2 1/2	72 1/2	2 1/2	36 1/2	33	

**Boiler Tubes:** Net base prices per 100 feet fob Pittsburgh in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

O.D. sizes	Hot Rolled		Cold Drawn		Elec. Weld	
	B.W.G.	Hot	Cold	Hot	Cold	Hot
1"	13	\$9.90	\$9.36	\$9.65	\$9.65	\$9.65
1 1/4"	13	11.73	9.63	11.43	11.43	11.43
1 1/2"	13	\$10.91	12.96	10.63	12.64	12.64
1 3/4"	13	12.41	14.75	12.10	14.37	14.37
2"	13	13.90	16.52	13.53	16.19	16.19
2 1/4"	13	15.50	18.42	15.06	18.03	18.03
2 1/2"	12	17.07	20.28	16.57	19.83	19.83
2 3/4"	12	18.70	22.21	18.11	21.68	21.68
3"	12	19.82	23.54	19.17	22.95	22.95
3 1/2"	12	20.79	24.71	20.05	24.02	24.02
3 3/4"	11	26.24	31.18	25.30	30.29	30.29
4"	10	32.56	38.68	31.32	37.52	37.52
4 1/2"	9	43.16	51.29			
5"	9	49.96	59.36			
6"	7	76.71	91.14			

**Pipe, Cast Iron:** Class B, 6-in. and over, \$60 per net ton, Birmingham; \$65, Burlington, N. J.; \$62.80, del., Chicago; 4-in. pipe, \$5 higher, Class A pipe, \$3 a ton over class B.

**Rails, Supplies**

Standard rails, over 60-lb, fob mill, net ton, \$43.40. Light rails (billet), Pittsburgh, Chicago, Birmingham, net ton, \$49.18.

Relaying rails, 35 lb and over, fob railroad and basing points, \$31-\$33.

Supplies: Track bolts, 6.50c; heat treated, 6.75c. Tie plates \$51 net ton, base, Standard spikes, 3.65c.

**Bolts, Nuts**

Fob Pittsburgh, Cleveland, Birmingham, Chicago. Additional discounts: 5 for carloads; 10 for full containers, except tire, step and plow bolts.

(Ceiling prices advanced 12 per cent, effective July 27, 1946; discounts remain unchanged.)

Carriage and Machine		
1/2 x 6 and smaller	65 1/2 off	
Do., 3/4 and 5/8 x 6-in. and shorter	63 1/2 off	
Do., 3/4 to 1 x 6-in. and shorter	61 off	
1 1/2 and larger, all lengths	59 off	
All diameters, over 6-in. long	59 off	
Tire bolts	50 off	
Step bolts	56 off	
Plow bolts	65 off	

**Store Bolts**

In packages, nuts separate, 71-10 off, nuts attached, 71 off; bulk, 20 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts	U.S.S.	S.A.E.
Semifinished hex		
1/2-in. and smaller	64	
3/4-in. and smaller	62	
1/2-in.-1-in.	60	
3/4-in.-1-in.	59	
1 1/4-in.-1 1/2-in.	57	
1 1/2-in. and larger	56	
Additional discount of 10 for full kegs.		
Hexagon Cap Screws		
Upset 1-in., smaller	64 off	
Milled 1-in., smaller	60 off	
Square Head Set Screws		
Upset 1-in. and smaller	71 off	
Headless, 3/4-in. and larger	60 off	
No. 10 and smaller	70 off	

**Rivets**

Fob Pittsburgh, Cleveland, Chicago, Birmingham

Structural ..... 4.78c

3/4-inch and up ..... \*65-5 off

\*Plus 12 per cent increase on base prices effective July 26.

**Washers, Wrought**

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, 1cl ..... \$2.75-\$3.00 or

**Tool Steels**

**Tool Steels:** Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb: reg. carbon 15.15c; extra carbon 19.48c; special carbon 23.80c; oil-hardening 25.97c; high carbon-chromium 46.53c.

W	Cr	V	Mo	Base, per lb
18.00	4	1		72.49c
1.5	4	1	8.5	58.43c
	4	2	3	58.43c
6.40	4.15	1.90	5	62.22c
5.50	4.50	4	4.50	75.74c

**Stainless Steels**

Base, Cents per lb					
CHROMIUM NICKEL STEELS					
	Bars	Plates	Sheets	Strip	C.R. Strip
302..	25.96c	29.21c	36.79c	23.93c	30.30c
303..	28.13	31.38	38.95	29.21	35.71
304..	27.05	31.38	38.95	25.45	32.46
308..	31.38	36.79	44.36	30.84	37.87
309..	38.95	43.28	50.85	40.08	48.59
310..	53.02	56.26	57.35	52.74	60.59
312..	38.95	43.28	53.02		
*316..	43.28	47.61	51.94	43.28	51.94
321..	31.38	36.79	44.36	31.65	41.12
347..	35.71	41.12	48.69	35.71	45.44
431..	20.56	23.80	31.38	18.94	24.38

STRAIGHT CHROMIUM STEEL					
	Bars	Plates	Sheets	Strip	C.R. Strip
403..	23.93	26.51	31.92	22.99	29.21
**410..	20.02	23.93	28.67	18.39	23.80
416..	20.56	23.80	29.21	19.75	25.45
420..	25.96	30.84	36.25	25.70	32.46
430..	20.56	23.80	31.38	18.94	24.38
†440F..	21.10	24.35	31.92	20.29	26.51
440A..	25.96	30.84	36.25	25.70	32.46
442..	24.35	27.59	35.17	25.96	34.62
443..	24.35	27.59	35.17	25.96	34.62
446..	29.76	33.00	39.19	37.87	46.26
501..	8.66	12.98	17.04	12.98	18.49
502..	9.74	14.07	18.12	14.07	19.28

STAINLESS CLAD STEEL (20%)					
(Fob Pittsburgh and Washington, Pa., plate prices include annealing and pickling.)					
	304	316	304	316	316
410..	19.48	20.56			
430..	17.31	18.39			
446..	17.85	18.94			
448..	19.48	20.56			

\* With 2-3% molybdenum. † With titanium. ‡ With columbium. \*\* Plus machining agent. †† High carbon. ††† Free machining.

**Metallurgical Coke**

Price Per Net Ton	
Beehive Ovens	
Connellsville, furnace	\$8.70
Connellsville, foundry	9.25-9.75
New River, foundry	10.25-10.50
Wise county, foundry	9.00-9.50
Wise county, furnace	8.50-9.00

By-Product Foundry	
Kearney, N. J., ovens	14.40
Chicago, outside delivered	14.86
Chicago, delivered	15.10
Terre Haute, delivered	14.86
Milwaukee, ovens	15.10
New England, delivered	16.00
St. Louis, delivered	15.18
Birmingham, delivered	12.25
Indianapolis, delivered</	



**PIG IRON**

Maximum prices per gross ton fixed by OPA schedule No. 10, last amended July 27, 1946; \$2 increase may be charged on adjustable pricing contracts made between May 29 and July 27. Delivered prices do not include 3 per cent federal tax, effective Dec. 1, 1942.

	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	\$29.50	\$29.00	\$30.50	\$30.00
Newark, N. J., del.	31.20	30.70	32.20	31.70
Brooklyn, N. Y., del.	32.28			32.78
Birdsboro, Pa., base	29.50	29.00	30.50	30.00
Birmingham, base	21.88	23.50	29.50	
Baltimore, del.	30.22			
Boston, del.	29.68			
Chicago, del.	28.72			
Cincinnati, del.	28.94	28.06		
Cleveland, del.	28.62	27.74		
Newark, N. J.	30.82			
Philadelphia, del.	30.05	29.55		
St. Louis, del.	28.62	29.54		
Buffalo, base	28.50	27.50	29.50	29.00
Boston, del.	30.06	29.56	31.06	30.56
Rochester, del.	30.03		31.03	30.53
Syracuse, del.	30.58		31.58	31.08
Chicago, base	28.50	28.00	29.00	28.50
Milwaukee, del.	29.73	29.23	30.23	29.73
Muskegon, Mich., del.	32.05			32.05
Cleveland, base	28.50	28.00	29.00	28.50
Akron, Canton, del.	30.04	29.54	30.54	30.04
Detroit, base	28.50	28.00	29.00	28.50
Saginaw, Mich., del.	30.81	30.31	31.31	30.81
Duluth, base	29.00	28.50	29.50	29.00
St. Paul, del.	31.13	30.63	31.63	31.13
Erie, Pa., base	28.50	28.00	29.00	28.50
Everett, Mass., base	30.06	29.56	31.06	30.56
Boston, del.	28.50	28.00	29.00	28.50
Granite City, Ill., base	29.00	28.50		29.00
St. Louis, del.	28.50	28.00		28.50
Hamilton, O., base	29.68	29.18		29.68
Cincinnati, del.	28.50	28.00		28.50
Neville Island, Pa., base	29.27	28.77		29.27
*Pittsburgh, del., N.&S. sides	26.50	26.00		26.50
Provo, Utah, base	28.50	28.00	29.00	28.50
Sharpsville, Pa., base	29.50	29.00		29.50
Sparrows Point, base	30.60			30.60
Baltimore, del.		29.00		
Steelton, Pa., base	29.50	29.00	30.50	30.00
Swedeland, Pa., base	30.43	29.93		30.43
Philadelphia, del.	28.50	28.00		28.50
Toledo, O., base	28.50	28.00	29.00	28.50
Youngstown, O., base	30.66	30.16	31.16	30.66
Mansfield, O., del.				

\* To Neville Island base add: 61c for McKees Rocks, Pa.; 93c Lawrenceville, Homestead, McKeesport, Ambridge, Monaca, Alliquippa; 97c (water), Monongahela; \$1.24, Oakmont, Verona; \$1.38, Brackenridge.

Exceptions to above prices: Struthers Iron & Steel Co., Struthers, O., may charge 50 cents a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable pig iron. Republic Steel Corp. may quote \$2 a ton higher for foundry and basic pig iron on the Birmingham base.

**Open Market Prices of Leading Ferroalloy Products**

**Spiegeleisen:** 19-21% carlot per gross ton, Palmerton, Pa., \$36; Pittsburgh, \$40.50; Chicago, \$40.60.

**Ferromanganese, standard:** 78-82% c.i. gross ton, duty paid, \$135 fob cars, Baltimore, Philadelphia or New York, whichever is most favorable to buyer, Rockdale or Rockwood, Tenn. (where Tennessee Products Co. is producer), Birmingham, Ala. (where Sloss-Sheffield Steel & Iron Co. is producer); \$140 fob cars, Pittsburgh (where Carnegie-Illinois Steel Corp. is producer); add \$6 for packed c.i., \$10 for ton, \$13.50 for less ton; \$1.70 for each 1%, or fraction contained manganese over 82% or under 78%.

**Ferromanganese, low carbon:** Eastern zone: Special, 21c; regular, 20.50c; medium, 14.50c; central zone: special, 21.30c; regular, 20.80c; medium, 14.80c; western zone: Special, 21.55c; regular, 21.00c; medium, 15.75c. Prices are per pound contained Mn, bulk carlot shipments, fob shipping point, freight allowed. Special low-carbon has content of 90% Mn, 0.10% C, and 0.08% P.

**Ferromanganese Briquets:** (Weight approx. 3 lb and containing exactly 2 lb Mn) per lb of briquets. Contract, carlots, bulk 0.0605c, packed 0.068c, tons 0.055c, less 0.068c, eastern, freight allowed; 0.063c, 0.0655c, 0.0775c and 0.078c, central; 0.060c, 0.0635c, 0.0855c and 0.088c, western; spot up 0.25c.

**Ferromanganese:** Spot 10,000 lb or more, per lb contained W. \$1.90; contract, \$1.88; freight allowed as far west as St. Louis.

**Ferrotitanium:** 40-45%, R.R. freight allowed, per lb contained Ti: ton

**High Silicon, Silvery**  
 6.00-6.50 per cent (base).... \$34.00  
 6.51-7.00... \$35.00 9.01- 9.50. 40.00  
 7.01-7.50... 36.00 9.51-10.00. 41.00  
 7.51-8.00... 37.00 10.01-10.50. 42.00  
 8.01-8.50... 38.00 10.51-11.00. 43.00  
 8.51-9.00... 39.00 11.01-11.50. 44.00  
 Fob Jackson county, O., per gross ton. Buffalo base \$1.25 higher. Buyer may use whichever base is more favorable.

**Electric Furnace Ferrosilicon:** Si 14.01-14.50%, \$48, Jackson, O.; \$51.25 Keokuk, Iowa; \$49.25 Niagara Falls, N. Y. Add \$1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; \$1 a ton for 0.045 % max. phos.

**Bessemer Ferrosilicon**  
 Prices same as for high silicon silvery iron, plus \$1 per gross ton.

**Charecoal Pig Iron**  
 Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn. \$33.00 (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

**Gray Forge**  
 Neville Island, Pa. .... \$28.00  
 Valley base ..... 28.00

**Low Phosphorus**  
 Basing points: Birdsboro, Pa., Steelton, Pa., and Buffalo, N. Y., \$34.00 base; \$35.38, del., Philadelphia. Intermediate phosphorus, Central Furnace, Cleveland, \$31.00.

**Differentials**  
 Basing point prices are subject to following differentials:  
**Silicon:** An additional charge not to exceed 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).  
**Phosphorus:** A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.  
**Manganese:** An additional charge not to exceed 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

**Nickel:** An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, \$2 a ton; for each additional 0.25% nickel, \$1 a ton.

**Refractories**

Per 1000, fob shipping point  
 Net prices  
**Fire Clay Brick**  
 Super Duty  
 Pa., Mo., Ky. .... \$81.00

High Heat Duty  
 Pa., Ill., Md., Mo., Ky. .... 65.00  
 Ala., Ga. .... 65.00  
 N. J. .... 70.00

Intermediate Heat Duty  
 Ohio ..... 57.00  
 Pa., Ill., Md., Mo., Ky. .... 59.00  
 Ala., Ga. .... 51.00  
 N. J. .... 62.00

Low Heat Duty  
 Pa., Md., Ohio ..... 51.00

**Malleable Bung Brick**  
 All bases ..... 75.00

**Ladle Brick**  
 (Pa., O., W. Va., Mo.)  
 Dry Press ..... 42.00  
 Wire Cut ..... 40.00

**Silica Brick**  
 Pennsylvania ..... 65.00  
 Joliet, E. Chicago ..... 74.00  
 Birmingham, Ala. .... 65.00

**Magnesite**  
 Domestic dead-burned grains, net ton, fob Chewelah, Wash  
 Bulk ..... 22.00  
 Bags ..... 26.00

**Basic Brick**  
 Net ton, fob Baltimore, Plymouth Meeting, Chester, Pa.  
 Chrome brick ..... 54.00  
 Chem. bonded chrome ..... 54.00  
 Magnesite brick ..... 75.00  
 Chem. bonded magnesite .... 5.00

**Fluorspar**

Metallurgical grade, fob shipping point in Ill., Ky., net tons, carloads, effective CaF<sub>2</sub> content, 70% or more, \$33; 65% to 70%, \$32; 60% to 65%, \$31; less than 60%, \$30.

tract ton lots \$1.20, less ton lots \$1.30, eastern, freight allowed; \$1.2075 and \$1.3075 central; \$1.229 and \$1.329, western; spot add 5c.

**Ferrocolumbium:** 50-60% per lb contained columbium in gross ton lots, contract basis, R. R. freight allowed, eastern zone, \$2.25; less-ton lots \$2.30. Spot prices up 10 cents.

**Ferrocrome:** Contract, lump, packed; high carbon, eastern zone, c.i. 15.05c, ton lots 15.55c; central zone, add 0.40c and 0.65c; western zone, add 0.5c and 1.85c; high carbon, high nitrogen, add 5c to all high carbon ferrocrome prices. Deduct 0.55c for bulk carlots. Spot prices up 0.25c.

Low carbon, eastern zone, bulk, c.i., max. 0.06% C 23c; 0.1% 22.50c, 0.15% 22c, 0.2% 21.50c, 0.5% 21c, 1% 20.50c, 2% 19.50c, add 1c for 2000 lb to c.i.; central zone, add 0.4c for bulk, c.i., and 0.65c for 2000 lb to c.i.; western zone, add 0.5c for bulk, c.i., and 1.85c for 2000 lb to c.i.; carload packed differential 0.45c. Prices are per pound of contained Cr, fob shipping points.

Low carbon, high nitrogen: Add 2c to low carbon ferrocrome prices. For higher nitrogen low carbon, add 2c for each 0.25% of nitrogen over 0.75%.

**Ferrocrome, Special Foundry:** (Cr 62-66%, C about 5-7%.) Contract, lump packed, eastern zone, freight allowed, c.i. 15.60c, ton lots 16.10c, less than ton 16.75c; central zone, add 0.40c for c.i. and 0.65c for smaller lots; western zone, add 0.5c for c.i. and 1.85c for smaller lots. Deduct 0.55c for bulk carlots.

**S. M. Ferrocrome, high carbon:** (Cr 60-65%, Si, Mn and C 4-6% each.): Contract, lump, packed, eastern

zone, freight allowed, c.i. 16.15c, ton lots 16.65c, less ton 17.30c; central zone, add 0.40c for c.i. and 0.65c for smaller lots; western zone, add 0.5c for c.i. and 1.05c for smaller lots. Prices are per lb of contained chromium; spot prices 0.25c higher. Deduct 0.55c for bulk carlots.

**S. M. Ferrocrome, low carbon:** (Cr 62-66%, Si 4-6%, Mn 4-6% and C 1.25% max.) Contract, carlot, bulk, 20.00c, packed 20.15c ton lots 21.00c, less ton lots 22.00c eastern, freight allowed, per pound contained chromium, 20.40c, 20.50c, 20.95c and 22.65c, central; 21.00c, 21.45c, 22.85c and 23.85c, western; spot up 0.25c.

**Ferrocrome Briquets:** Containing exactly 2 lb Cr, packed eastern zone, c.i. 9.50c, ton lots 9.50c less than ton 10.10c, central zone, add 0.3c for c.i. and 0.5c for smaller lots; western zone, add 0.70c for c.i. and 2c for smaller lots. Deduct 0.30c for bulk carlots. Prices per lb of briquets; spot prices 0.25c higher.

**Chromium Metal:** 97% min chromium, max. 0.50% carbon, eastern zone, per lb contained chromium bulk, c.i., 79.50c, 2000 lb to c.i. 80c, central 81c and 82.60c; western 82.25c and 84.75c fob shipping point, freight allowed.

**Chromium-Copper:** (Cr 8-11%, Cu 88-90%, Fe 1% max., Si 0.50% max.) contract, any quantity, 45c, eastern, Niagara Falls, N. Y., basis, freight allowed to destination, except to points taking rate in excess of St. Louis rate to which equivalent of St. Louis rate will be allowed; spot up 2c.

**Calcium metal; cast:** Contract ton lots or more \$1.35, less, \$1.60, pound of metal; \$1.36 and \$1.61

central, \$1.40 and \$1.65, western; spot up 5c.  
**Calcium-Manganese-Silicon:** (Ca 16-20%, Mn 14-18% and Si 53-59%), per lb. of alloy. Contract, carlots, 15.50c, ton lots 16.50c and less 17.00c, eastern, freight allowed; 16.00c, 17.35c, and 17.85c, central; 18.05c, 19.10c and 19.60c western; spot up 0.25c.

**Calcium - Silicon:** (Ca 30-35%, Si 60-65% and Fe 3.00% max.), per lb of alloy. Contract, carlot, lump 13.00c, ton lots 14.50c, less 15.50c eastern, freight allowed; 13.50c, 15.25c and 16.25c central; 15.55c, 17.40c and 18.40c, western; spot up 0.25c.

**Silicon Metal:** Min. 97% Si and max 1% Fe, eastern zone, bulk, c.l., 12.90c; 2000 lb to c.l., 13.45c; central, 13.20c and 13.90c; western, 13.85c and 16.80c; min. 96% Si and max. 2% Fe, eastern, bulk; c.l., 12.50c, 2000 lb to c.l., 13.10c; central, 12.80c and 13.55c; western, 13.45c and 16.50c, fob shipping point, freight allowed. Price per lb contained Si.

**Aluminum-Manganese**, containing exactly 2 lb Mn and about 1/2 lb Si, eastern zone, bulk, c.l. 5.80c, ton lots 6.35c; central zone, add 0.25c for c.l. and 1c for ton lots; western, add 0.55c for c.l. and 0.20c for ton lots. **Ferrosilicon**, weighing about 5 lb and containing exactly 2 lb Si, or about 2 1/2 lb and containing exactly 1 lb Si, packed, eastern zone, c.l. 3.90c, ton lots 4.15c, less ton lots 4.45c; central zone, add 0.15c for c.l. and

0.40c for smaller lots; western zone, add 0.30c for c.l. and 0.45c for smaller lots. Prices are fob shipping point, freight allowed; spot prices 0.25c higher. Deduct 0.30c for bulk carlots.

**Manganese Metal:** (Min. 96% Mn, max. 2% Fe), per lb of metal, eastern zone, bulk, c.l., 30c, 2000 lb to c.l., 32c, central, 30.25c, and 33c; western, 30.55c and 35.05c.

**Electrolytic Manganese:** 99.9% plus, fob Knoxville, Tenn., freight allowed east of Mississippi on 250 lb or more; Carlots 32c, ton lots 34c, drum lots 36c, less than drum lot 38c. Add 1 1/2c for hydrogen-removed metal.

**Manganese-Boron:** (Mn 75% approx., B 15-20%, Fe 5% max., Si 1.50% max. and C 3% max.) per lb of alloy. Contract ton lots, \$1.89, less \$2.01, eastern; freight allowed; \$1.903 and \$2.023, central, \$1.935 and \$2.055 western; spot up 5c.

**Nickel-Boron:** (B 15-18%, Al 1% max., Si 1.50% max., C 0.50% max., Fe 3% max., Ni, balance), per lb of alloy. Contract, 5 tons or more, \$1.90, 1 ton to 8 tons, \$2.00, less than ton \$2.10, eastern, freight allowed; \$1.9125, \$2.0125 and \$2.1125, central; \$1.9445, \$2.0445 and \$2.1445, western; spot same as contract.

**Borasil:** 3 to 4% B, 40 to 45% Si, \$6.25 lb contained B, fob Phila. O., freight not exceeding St. Louis rate allowed.

**Boritan:** B 1.5-1.9%, ton lots, 45c lb; less-ton lots, 50c lb.

**Carbortan:** B 0.90 to 1.15% net ton to carload, 8c per lb fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

**Silicaz Alloy:** (Si 35-40%, Ca 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%), per lb of alloy contract, carlots 25.00c, ton lots 26.00c, less ton lots 27.00c, eastern, freight allowed, 25.50c, 26.75c and 27.75c, central; 27.50c, 28.90c and 29.90c, western; spot up 0.25c.

**Silvaz Alloy:** (Si 35-40%, Va 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%), per lb of alloy. Contract, carlots 58.00c, ton lots 59.00c, less 60.00c, eastern freight allowed; 58.50c, 59.75c and 60.75c, central; 60.50c, 61.90c and 62.90c, western; spot up 0.25c.

**SMZ Alloy:** (Si 60-55%, Mn 5-7%, Zr 5-7% and Fe approx. 20%) per lb of alloy contract carlots 11.50c, ton lots 12.00c, less 12.50c, eastern zone, freight allowed; 12.00c, 12.85c and 13.35c, central zone; 14.05c, 14.60c and 15.10c, western; spot up 0.25c.

**CMZ Alloy 4:** (Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75% and C 3.00-4.50%), Contract carlots, bulk, 11.00c and packed 11.50c; ton lots 12.00c; less 12.50c, eastern, freight allowed; 11.50c and 12.00c, 12.75c, 13.25c, central; 13.50c and 14.00c, 14.75c, 15.25c, western; spot up 0.25c.

**CMZ Alloy 5:** (Cr 50-56%, Mn 4-6%, Si 13.50-16.00%, Zr 0.75-1.25%, C 3.50-5.00%) per lb of alloy. Contract, carlots, bulk, 10.75c,

packed 11.25c, ton lots 11.75c, less 12.25c, eastern, freight allowed; 11.25c, 11.75c, 12.50c and 13.00c, central; 13.25c and 13.75c, 14.50c and 15.00c, western; spot up 0.25c.

**Zirconium Alloy:** 12-15%, per lb of alloy, eastern contract, carlots, bulk, 4.60c, packed 4.80c, ton lots 4.80c, less tons 5c, carloads, bulk, per gross ton \$102.50; packed \$107.50; ton lots \$108; less-ton lots \$112.50. Spot up \$5 per ton.

**Zirconium Alloy:** Zr 35-40%, eastern, contract basis, carloads in bulk or package, per lb of alloy 14.00c; gross ton lots-15.00c; less-ton lots 16.00c. Spot up 1/4c.

**Alsil:** (Approx. 20% Al, 40% Si, 40% Fe) contract basis fob Niagara Falls, N. Y., lump per lb 5.88c; ton lots 6.38c; less 6.88c. Spot up 1/4c.

**Silmanal:** (Approx. 20% each Si, Mn, Al) Packed, lump, carload 9c, ton lots 9.25c, less-ton lots 9.75c per lb alloy; freight not exceeding St. Louis rate allowed.

**Tungsten Metal Powder:** Spot, not less than 97%, \$2.50-\$2.60; freight allowed as far west as St. Louis.

**Grinal:** Vanadium Grinal No. 1 87.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.  
**Vanadium Pentoxide, technical grade:** Fused, approx. 89-92% V<sub>2</sub>O<sub>5</sub> and 5.84% Na<sub>2</sub>O; or air dried, 89-85% V<sub>2</sub>O<sub>5</sub> and 5.15% Na<sub>2</sub>O, \$1.10 per lb contained V<sub>2</sub>O<sub>5</sub>, fob plant, freight allowed on quantities of 20 lb and over to St. Louis.

# OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, delivered at consumer's plant except where noted. For complete OPA price schedule refer to MPR-4

## OPEN HEARTH AND BLAST FURNACE GRADES

	—Heavy Melting—		No. 1 Busheling	Bundles			Machine Shop Turnings	Mixed Borings, Turnings	Short Shovel Turnings	Cast Iron Borings
	No. 1	No. 2		No. 1	No. 2	No. 3				
New York	15.33	15.33	15.33		15.33	13.33	10.33	10.33	12.33	
Philadelphia	18.75	18.75	18.75	18.75	18.75	16.75	13.75	13.75	15.75	14.75
Boston	14.08	14.08	14.08	14.08	14.08		9.08	9.08	11.08	
Cleveland	19.50	19.50	19.50	19.50	19.50		14.50	14.50	16.50	13.50-14.00
Pittsburgh	20.00	20.00	20.00	20.00	20.00		15.00	15.00	17.00	16.00
Valley	20.00			20.00		18.00	15.00	15.00	17.00	16.00
Mansfield							15.00			
Chicago	18.75	18.75	18.75	18.75	18.75	16.75	15.00	13.75	15.75	14.75
Buffalo	19.25	19.25	19.25	19.25	19.25		14.25	14.25	16.25	15.25
Detroit	17.32		17.32	17.32			12.32	12.32	14.32	13.33
St. Louis	17.50					15.32			12.50	
Cincinnati	19.50	19.50		19.50	19.50		10.50	10.50	12.50	
Birmingham	17.00	17.00	17.00	17.00	17.00		10.50-11.00	10.50-11.00	12.50-13.00	11.50-12.00
San Francisco	17.00	17.00	17.00	17.00	17.00		15.00		12.00	
Seattle	14.50	14.50		17.00	17.00		9.00	7.00		
Los Angeles	14.00	13.00		12.00	12.00			5.50		

## ELECTRIC FURNACE, FOUNDRY AND SPECIAL GRADES

	Bar Crops and Plate	Cast Steel	Punchings and Plate Scrap	Electric Furnace Bundles	Heavy Turnings	Alloy Free Turnings	Cut Structural and Plate Scrap		No. 1 Chemical Cast Iron Borings	Tin Can Bundles
							1 ft and under	2 ft and under		
Philadelphia	21.25	21.25	21.25	19.75	18.25		21.25	17.33	16.51	
New York			17.83	16.33			17.83		14.33	
Boston									13.31	
Cleveland	22.00		22.00	20.50						
Pittsburgh	22.50	22.50	22.50	21.00	19.50	18.00	22.50	22.00	19.00	18.00
Chicago			21.25							
Detroit			19.82	18.32						
Birmingham	15.50									
San Francisco	15.50	15.50					19.00	18.50		14.50
						7.00	18.00	17.50		

## STEEL GRADES OF RAILROAD ORIGIN

	No. 1 Heavy Melting R.R. Steel	Railroad Malleable	Rails				Railroad Specialties	Uncut Tires	Angles, Splice Bar
			Axles	Rerolling	Random Lengths	Cut 3-ft and under			
Pittsburgh	21.00	22.00	26.00	23.50	21.50	23.50	24.75	24.50	23.50
Valley	21.00								
Chicago	19.75	22.00		22.25	20.25	22.25	23.50	22.75	21.00
St. Louis		22.00		21.00	19.00	21.50			
Cincinnati				20.50-21.00					
Birmingham			24.00	20.50	18.50				
San Francisco			24.00		18.50				
Seattle	14.50								20.50

## CAST IRON GRADES

	No. 1 Cupola Cast	Charging Box Cast	Heavy Breakable Cast	Stove Plate	Unstripped Motor Blocks	Malleable	Brake Shoes	Clean Auto Cast	No. 1 Wheels	Burnt Cast
Philadelphia	25.00	21.00	20.00	23.00	20.00	24.00	17.75	27.00	22.00	
Boston	25.00		20.00	23.00	20.00	24.00		27.00		17.75
Buffalo	25.00	21.00	20.00	23.00	20.00	24.00	17.75	27.00	22.00	17.75
Cleveland	25.00		20.00							
Pittsburgh	25.00	21.00	20.00	23.00	20.00	24.00	17.75	27.00	22.00	17.75
Los Angeles	25.00									
Chicago	25.00					24.00				
Detroit	25.00		20.00					27.00		
St. Louis	25.00	21.00	20.00	23.00			17.75	27.00	22.00	17.75
Cincinnati	25.00		20.00	23.00						
Birmingham	25.00		20.00	23.00	20.00					
Seattle	25.00						17.75		22.00	

\* Fob shipping point; † fob tracks; ‡ dealers buying prices.



# STEEL CAPACITY?

1. How much steelmaking capacity was added during the war?
2. How much money was spent? Where are the plants located?
3. What is steelmaking capacity today?
4. Is more capacity needed?
5. What has been the long-term trend in capacity and production?
6. What will sheet and strip capacity be in 1947?
7. What new finishing capacity has been added since the war?
8. What companies make the sheets, strip, bars, plates, shapes, pipe, wire and other finished products you need today?



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AND 18-PAGE SUPPLEMENT

## *Answers All Those Questions...*

Describes in detail the added capacity and cost of every steelmaking facility built during the war. Contains detailed list of companies making every type of finished steel product, plus latest data on new mills now being constructed. Included is much heretofore unpublished information on new and revamped facilities of hundreds of plants, including those in ore, ore transportation, coal and coke, refractory, ferroalloy, scrap, foundry and forging industries. It is illustrated by 148 photographs, numerous charts and tables.



### AN OFFICIAL REPORT

Prepared by W. A. Hauck who was closely associated with the steel expansion program all through the war as a top executive of the Steel Division of the War Production Board and now is in charge of steel plant disposal for the War Assets Administration.

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# NONFERROUS METAL PRICES

**Copper:** Electrolytic or Lake from producers in carlots 14.37½c, del. Conn.; less carlots 14.50c, refinery. Dealers may add ¼c for 5000 lb to carload; 1c, 1000-4999 lb; 1½c, 500-999 lb; 2c, 0-499 lb. Casting, 14.12½c, refinery, 20,000 lb or more; 14.37½c, less than 20,000 lb.

**Brass Ingot:** 85-5-5-5 (No. 115) 15.50c; 88-10-2 (No. 215) 18.75c; 80-10-10 (No. 305) 18.25c; No. 1 yellow (No. 405) 12.50c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than 20 tons.

**Zinc:** Prime western 9.25c, select 9.35c, brass special 9.50c, intermediate 9.75c, E. St. Louis; high grade 10.25c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

**Lead:** Common 8.10c, chemical 8.20c, corroding, 8.20c, E. St. Louis for carlots; add 5 points for Chicago, Minneapolis-St. Paul, Milwaukee-Kenosha districts; add 15 points for Cleveland-Akron-Detroit area, New Jersey, New York state, Texas, Pacific Coast, Richmond, Indianapolis-Kokomo; add 20 points for Birmingham, Connecticut, Boston-Worcester, Springfield, New Hampshire, Rhode Island.

**Primary Aluminum:** 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ¼c 2000-9999 lb; 1c less through 2000 lb.

**Secondary Aluminum:** Piston alloy (No. 122 type) 14.50c; No. 12 foundry alloy (No. 2 grade) 14.12½c; steel deoxidizing grades, notch bars, granulated or shot; Grade 1 (95-97½%) 15.00c; grade 2 (92-95%) 13.75c; grade 3 (90-92%) 13.50c; grade 4 (85-90%) 13.00c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

**Magnesium:** Commercially pure (99.8%) standard ingots (4-notch, 17 lb) 20.50c per lb, carlots; 22.50c 100 lb to c.l. Extruded 12-in. sticks 27.50c, carlots; 29.50c 100 lb to c.l.

**Tin:** Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1¼c 1000-2239, 2¼c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Stralls), 52.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 51.87½c; Grade C, 99.65-99.79% incl. 51.62½c; Grade D, 99.50-99.64% incl., 51.50c; Grade E, 99-99.49% incl. 51.12½c; Grade F, below 99% (for tin content), 51.00c.

**Antimony:** American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 14.50c; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 15.00c. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 9999-224 lb; and 2c for 223 lb and less; on sales by dealers, distributors and jobbers add ¼c, 1c, and 3c, respectively.

**Nickel:** Electrolytic cathodes, 99.5%, fob refinery 35.00c lb; pig and shot produced from electrolytic cathodes 36.00c; "F" nickel shot or ingot for additions to cast iron, 34.00c.

**Mercury:** Open market, spot, New York, \$95-\$98 per 76-lb flask.

**Arsenic:** Prime, white, 99%, carlots, 4.00c lb.

**Beryllium-Copper:** 3.75-4.25% Be, \$14.75 per lb contained Be.

**Cadmium:** Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms \$1.25 lb, del.; anodes, balls, discs and all other special or patented shapes, \$1.30.

**Cobalt:** 97-99%, \$1.50 lb, for 550 lb (bbl.); \$1.52 lb for 100 lb (case); \$1.57 lb under 100 lb.

**Gold:** U. S. Treasury, \$35 per ounce.

**Indium:** 99.9%, \$2.25 per troy ounce.

**Silver:** Open market, N. Y. 90.12½c per ounce.

**Platinum:** \$70.50 per ounce.

**Palladium:** \$24 per troy ounce.

**Iridium:** \$125 per troy ounce.

## Rolled, Drawn, Extruded Products

(Copper and brass product prices based on 14.37½c, Conn., for copper. Freight prepaid on 100 lb or more.)

**Sheet:** Copper 25.81c; yellow brass 23.67c; commercial bronze, 95% 26.14c, 90% 25.81c; red brass, 85% 24.98c, 80% 24.66c; best quality 24.38c; phosphor bronze, grade A 4% or 5%, 43.45c; Everdur, Duronze or equiv., hot rolled, 30.88c; naval brass 23.53c; manganese bronze 31.99c; muntz metal 26.78c; nickel silver 5% 32.38c.

**Rods:** Copper, hot rolled 22.16c, cold drawn 23.16c; yellow brass 18.53c; commercial bronze, 95% 25.83c, 90% 25.50c; red brass, 85% 24.67c; 80% 24.35c; best quality 24.07c; phosphor bronze, grade A 4% or 5% 43.70c; Everdur, Duronze or equiv. cold drawn, 29.82c; naval brass 22.59c; manganese bronze 25.93c; muntz metal 22.34c; nickel silver 5% 34.44c.

**Seamless Tubing:** Copper 25.85c; yellow brass 26.43c; commercial bronze 90% 28.22c; red brass 85% 27.64c, 80% 27.32c; best quality brass 26.79c; phosphor bronze, grade A 5% 44.70c.

**Copper Wire:** Bare, soft, fob eastern mills, carlots 19.89c, less carlots 20.39c; weatherproof, fob eastern mills carlot 22.07c, less carlots 22.57c; magnet, delivered, carlots, 23.90c, 15,000 lb or more 23.55c, less carlots 24.05c.

**Aluminum Sheets and Circles:** 2s and 3s flat mill finish, base 30,000 lb or more del.; sheet widths as indicated; circle diameter 9" and larger:

Gage	Width	Sheets	Circles
.249"-7	12"-48"	22.70c	25.20c
8-10	12"-48"	23.20c	25.70c
11-12	26"-48"	24.20c	27.00c
13-14	26"-48"	25.20c	28.50c
15-16	26"-48"	26.40c	30.40c
17-18	26"-48"	27.90c	32.90c
19-20	24"-42"	29.80c	35.30c
21-22	24"-42"	31.70c	37.20c
23-24	3"-24"	25.60c	29.20c

**Lead Products:** Prices to jobbers; full sheets 11.25c; cut sheets 11.50c; pipe 9.90c, New York, 10.00c Philadelphia, Baltimore, Rochester and Buffalo, 10.50c Chicago, Cleveland, Worcester and Boston.

**Zinc Products:** Sheet fob mill, 14.15c, 36,000 lb and over deduct 7%, Ribbon and strip 13.25c; 3000-lb lots deduct 1%, 6000 lb 2%, 9000 lb 3%, 18,000 lb 4%, carloads and over 7%. Boiler plate (not over 12") 3 tons and over 12.00c; 1-3 tons 13.00c; 500-2000 lb 13.50c; 100-500 lb 14.00c; under 100 lb 15.00c. Hull plate (over 12") add 1c to boiler plate prices.

## PLATING MATERIALS

**Chromic Acid:** 99.75%, flake, del., carloads 16.25c; 5 tons and over 16.75c; 1-5 tons 17.25c; 400 lb to 1 ton 17.75c; under 400 lb 18.25c.

**Copper Anodes:** In 500-lb lots, fob shipping point, freight allowed, cast oval over 15 in., 25.125c; curved, 20.375c; round oval straight, 19.375c; electro-deposited, 18.875c.

**Copper Carbonate:** 52-54% metallic Cu, 250 lb barrels 20.50c.

**Copper Cyanide:** 70-71% Cu, 100-lb kegs or bbls 34.00c, fob, Niagara Falls.

**Sodium Cyanide:** 96%, 200-lb drums 15.00c; 10,000-lb lots 13.00c fob Niagara Falls.

**Nickel Anodes:** 500-2999 lb lots; cast and rolled carbonized 47.00c; rolled depolarized 48.00c.

**Nickel Chloride:** 100-lb kegs or 275-lb bbls 18.00c lb, del.

**Tin Anodes:** 1000 lb and over 58.50c del.; 500-999 59.00c; 200-499 59.50c; 100-199 61.00c.

**Tin Crystals:** 400 lb bbls 39.00c fob Grasselli, N. J.; 100-lb kegs 39.50c.

**Sodium Stannate:** 100 or 300-lb drums 36.50c del.; ton lots 35.50c.

**Zinc Cyanide:** 100-lb kegs or bbls 33.00c fob Niagara Falls.

## Scrap Metals

**Brass Mill Allowances:** Prices for less than 15,000 lb fob shipping point. Add ¼c for 15,000-40,000 lb; 1c for 40,000 lb or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	12.000	12.000	11.250
Yellow brass	9.875	9.625	9.125
Commercial bronze			
95%	11.250	11.000	10.500
90%	11.125	10.875	10.375
Red Brass			
85%	10.875	10.625	10.125
80%	10.875	10.625	10.125
Best quality (71-79%)	10.500	10.250	9.750
Nuntz metal	9.250	9.000	8.500
Nickel silver, 5%	10.500	10.250	
Phos. br., A, B, 5%	12.750	12.500	11.500
Naval brass	9.500	9.250	8.750
Manganese bronze	9.500	9.250	8.750

**Other than Brass Mill Scrap:** Prices apply on material not meeting brass mill specifications and are fob shipping point; add ¼c for shipment of 60,000 lb of one group and ¼c for 20,000 lb of second group shipped in same car. Typical prices follow:

(Group 1) No. 1 heavy copper and wire, No 1 tinned copper and copper borings 11.50c; No 2 copper wire and mixed heavy copper, copper tuyeres 10.50c.

(Group 2) Soft red brass and borings, aluminum bronze 10.75c; copper-nickel solids and borings 11.00c; lined car boxes, cocks and faucets 9.50c; bell metal 17.25c; babbitt-line brass bushings 14.75c.

(Group 3) Admiralty condenser tubes, brass pipe 8.75c; muntz metal condenser tubes 8.25c; old rolled brass 8.25c; manganese bronze solids; (lead 0%-0.40%) 8.00c; (lead 0.41%-1%) 7.00c; manganese bronze borings, 7.25c.

**Aluminum Scrap:** Price fob point of shipment, truckloads of 5000 pounds or over; Segregated solids, 2S, 3S, 5c lb, 11, 14, etc., 3 to 3.50c lb. All other high grade alloys 5c lb. Segregated borings and turnings, wrought alloys, 2, 2.50c lb. Other high-grade alloys 3.50c, 4.00c lb. Mixed plant scrap, all solids, 2, 2.50c lb borings and turnings one cent less than segregated.

**Lead Scrap:** Prices fob point of shipment. For soft and hard lead, including cable lead, deduct 0.75c from basing point prices for refined metal.

**Zinc Scrap:** New clippings 8.00c, old zinc 6.50c fob point of shipment, add ¼c for 10,000 lb or more. New die cast scrap 5.70c, radiator grilles 5.70c, add ¼c for 20,000 lb or more. Unswaged zinc dross, die cast slab 6.55c, any quantity.

**Nickel, Monel Scrap:** Prices fob point of shipment; add ¼c for 2000 lb or more of nickel or cupro-nickel shipped at one time and 20,000 lb or more of monel. Converters (dealers) allowed 2c premium.

**Nickel:** 98% or more nickel and not over ¼% copper 23.00c; 90-98% nickel, 23.00c per lb nickel contained.

**Cupro-nickel:** 90% or more combined nickel and copper 26.00c per lb contained nickel, plus 8.00c per lb contained copper; less than 90% combined nickel and copper 26.00c for contained nickel only.

**Monel:** No. 1 castings, turnings 15.00c; new clipping 20.00c; solder sheet 18.00c.

## Sheets, Strip . . .

*Booking for first quarter more general but quotas are limited by carryovers; alloy sheets are easiest*

Sheet & Strip Prices, Page 156

New York — One leading sheet seller within the past week has set up first quarter quotas, and another is expected to momentarily. As their arrearages will undoubtedly be substantial at the end of this year and as they contemplate one more quarter of rated tonnage, they and other producers who have taken such action are limiting quotas to moderate proportions and are warning their trade that they may have to make further reductions later.

One large sheet seller at least may not take general action until the middle of November and then set up schedules for only January. Because of the probability there might be further changes if he attempted to set up schedules for the entire first quarter, he is planning to operate on a month to month basis for the first period at least.

With CPA scheduled to expire Mar. 31 and the probability of a return to normal trading after that, this producer may not continue on such a basis in the second quarter, although shortage in sheets is expected to continue for some time.

Alloy sheets appear to be in the easiest position of all of the flat-rolled grades. Nevertheless order books for first quarter are filling at a fairly comfortable rate, producers declare.

Various tonnages have appeared in the market recently representing hardship cases. Ratings for these cases were revised Oct. 1.

St. Louis — Pressure of sheets continues to tighten although there is no prospect of order books reopening before first quarter. Demand for 18-gage and lighter is heaviest. Production has climbed back to its recent high level, following repair of two new open hearths which buckled when they were blown in. Output now is expected to remain unchanged until a new cold mill is completed about April 1. Deliveries are eight to nine months delayed and February schedules are being rolled now. First new orders accepted will be for third quarter next year.

Cincinnati — Continuing flow of priority orders for sheets remains an upsetting or embarrassing factor, in district mills. Resulting delays in shipment to other customers assure, because of the carryover, an extremely tight supply situation in first quarter. On some items mills are eight weeks in arrears on promised delivery. District interests believe they are in a safe position, for the winter, on supplies of iron ore and coal.

Pittsburgh — OPA has permitted an increase in tack plate quality sheets to \$12.50 per ton over hot-rolled sheet base, in addition to size extras, effective Oct. 15. Previously this item carried \$6 per ton premium. Carnegie-Illinois Steel Corp. produces about 80 per cent of these sheets, which in prewar years averaged about 10,000 tons annually. Galvanized sheet production continues well below demand, due in part to unfavorable price-cost relationship and the impact of tin plate production (at integrat-

ed mills) on cold-reduction facilities. A number of steel companies no longer produce these sheets, and other interests have sharply reduced output. Advances in zinc prices and wage rates have pushed galvanized sheet production costs up about \$14 per ton since 1938, against OPA-sanctioned price advance of \$11 a ton during this period.

It also is pointed out price of black sheets has been advanced \$6.50 per ton and there has been no relative advance in galvanized and black sheets. Sellers expect CC ratings will be continued through first quarter, although no official decision has been reached. Most producers report a heavy influx of cold-rolled and galvanized rated tonnage just prior to Nov. 1, lead date deadline for December shipment. Much of this tonnage is for customers not previously served, and will result in considerable revision of December production schedules.

Boston—Stainless, including polished, among lighter flat-rolled products, are practically alone in the category of reasonable delivery and first quarter schedules are filling. Since August availability of stainless has improved notably polished due to operation of new polishing equipment. Other grades of flat-rolled, carbon especially, are scarce from mill to fabricated product. Black sheet quotas for some warehouses have been reduced twice this quarter with prospects only half of the original tonnage will come through.

Cleveland—A new decontrol order, covering certain steel mill products, was expected momentarily late last week. It was understood that the principal products to be placed on a free market basis are specialty items and those in the alloy classification. This action would confirm recent market reports that alloy products are in comparatively free supply. Order books for carbon sheet and strip are still overloaded, however, and in most instances this precludes acceptance of additional business for first quarter.

Philadelphia—Current quarter ratings on sheets for the housing program are now pretty well in, producers say. However, ratings are still coming out for tonnage to relieve hardship cases in various industries. In fact, they have been especially numerous over the past two weeks, all of which has made it difficult for producers to set up not only current schedules but also for next quarter. However, one large producer last week for the first time began accepting general tonnage for first quarter and at least one other expects to take similar action any moment. In both cases new allotments are likely to be small, because of heavy arrearages.

## Wire . . .

Wire Prices, Page 157

Pittsburgh — In addition to the \$20 per ton to be paid nail producers on shipments since Oct. 1 in excess of individual quotas, a premium of \$7.50 a ton will be given integrated producers on shipments over established quotas beginning Nov. 1 of wire and wire rods to nonintegrated interests for nail production. Under this plan nail production is expected to be increased from current monthly total of 65,000 tons to about 75,000 tons by close of this year. The aim is 80,000 tons monthly by end of

this year, but this probably won't be reached as wire rod supply is extremely tight. Distribution of nails is expected to be through regular distributors. Steel producers do not expect CPA to issue directive or priority preference ratings at the mill level.

Chicago—It is understood that one large wire producer is now entering orders for paving mesh for 1947. For other products, however, books are not yet open. Curiously, one area which in normal times satisfies its fence post demand from native wood has become a good buyer of steel posts. One jobber in the area sold 150,000 last year and could have doubled these sales had the posts been available.

Cleveland—Premium payment plan on nails, retroactive to Oct. 1, will result in a sharp increase reaching a peak of about 80,000 tons per month in December and holding at that rate through first quarter. At the same time, production of other products, such as fence and barbed wire, will have to be reduced to provide the increase in steel rod for nails.

The National Housing Agency's premium payment plan provides for incentive payments of \$20 a ton on all housing nails produced in excess of individual quotas. A second bonus of \$7.50 a ton will be paid to steel manufacturers for nail rod which they sell to nonintegrated mills for nail production. However, the company providing the rod must meet its own premium payment quota to qualify for the second premium.

Birmingham — No diminishing in pressure on wire mills is evident. Demand includes every item in wire, but nails continue to lead and considerable miscellaneous repair work is held up on that account. Drawn wire is needed by small manufacturers and agricultural interests press for wire fencing.

## Steel Bars . . .

*Mills taking first quarter orders on limited scale; small sizes most in demand and tightest*

Bar Prices, Page 156

Boston — With few exceptions, including forge shops, carbon bar consumers are dissatisfied with first quarter quotas assigned thus far; on the other hand some users in the textile machinery industry are sufficiently covered. The answer is that fabricators in this position are taking less tonnage than expected, bar inventories having become at least balanced in ratio to other products and components. This situation is not general and most shops seek at least full allocations. Carryovers will be heaviest in small sizes in both carbon and alloys, largest in the former and what easing is apparent is in stock over one-inch, frequently in cold-drawn.

Philadelphia—Some mills are now booked for first quarter on virtually all sizes of hot carbon bars and some declare that schedules on cold-rolled carbon bars are filling rapidly. Only on alloy bars are orders showing any particular disposition to lag.

New York — A leading producer of hot alloy bars has opened books for the general trade for first quarter. This in-

terest is one of the last to take action. In general sellers count on carrying over into next year a substantial tonnage of arrearages, with a result that new orders being entered for first quarter are limited. This is especially true with respect to small sizes, with some producers already sold out for the period. The small sizes of carbon bars also are in short supply, order books being well filled for first quarter of next year. Certain cold drawers claim that they now have little capacity left for larger sizes, as well, in that period. Hot alloy bars, however, can still be scheduled for January.

St. Louis — Demand for merchant bars continues heavy and high production has made no noticeable inroads on

backlogs. Manufacturers of consumer goods and agricultural equipment are pressing hard for small bars, many asserting that is their only remaining bottleneck. Order books, however, are not open to any but essential projects already in the blueprint stage. ODT's requirement for capacity carloading still continues to hamper some deliveries, resulting in general shipping confusion and delay to some buyers high on the order book. Increasing scrap shortages are a constant threat to production, as are changeovers to conform to preference ratings. Bar mills here have had several months of uninterrupted operation at practical capacity.

Seattle—Bar mills have not yet opened first quarter books, current back-

logs carrying well into that period. Orders for 1947 may be taken during November. First concern is to deliver present obligations before taking further orders. Uncertain conditions, including scrap shortage, dictate a cautious policy.

## Steel Plates . . .

*Demand heaviest in many months as freight car work presses strongly; large export needs being deferred*

Plate Prices, Page 157

New York—Between special demands for car equipment and for export, the plate market is as tight as it has been for many months. There is much pressure for directives for car work, both construction and repairs, with various discussions going on between Washington officials and others directly involved, but it may be at least another two weeks before final decision is reached.

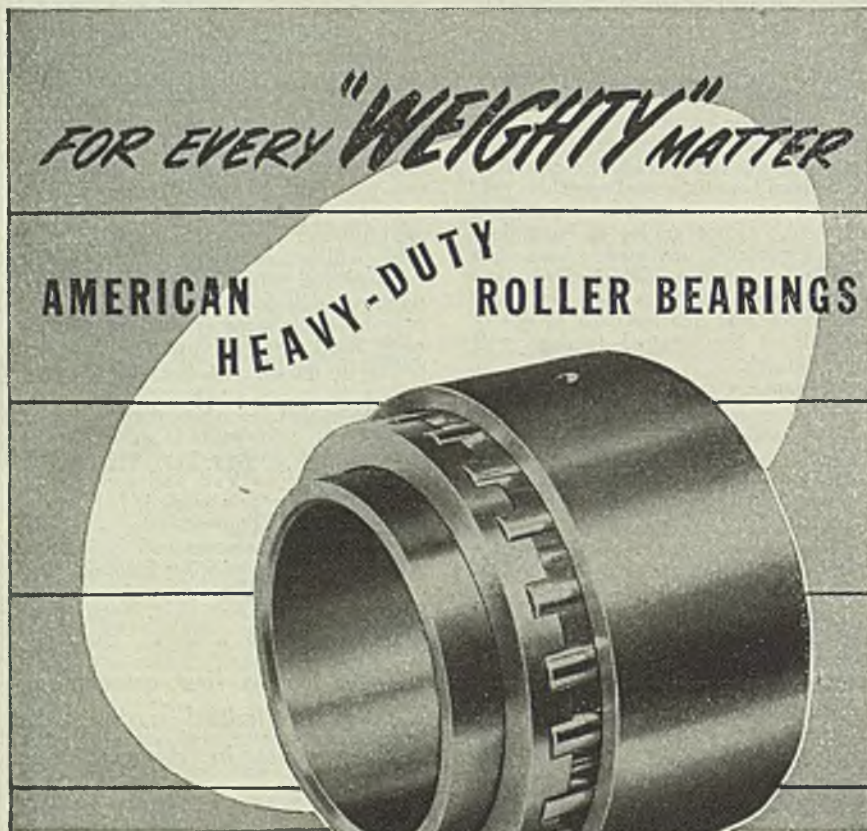
Meanwhile, plate mills have recently been allocated substantial tonnages for export, to back up promises which the state department had made to war devastated countries in Europe some time ago but which it has not been able to fulfill, to date to anything like the extent discussed. Allocations start this month and will continue through the next three months. Earlier in the fall the tonnage involved was set up for rolling in the final two months of the year, but because of special domestic needs the period was extended to four months.

With the major maritime strikes now ended, ship repair work is also expected to require much more steel. Because of waterfront disruptions there is now quite an accumulation of this work. Meanwhile tank shops and other fabricators report a continuing delay in shipment from mills.

Boston — Pressure for tank steel holds and shops fabricating lighter gages are operating with unbalanced inventories of both plates and heads. There is no easing in other grades with several eastern mills unable to reach capacity because of raw material limitations. Heavier plates, except for weldments, are not as active as lighter material and backlogs are top-heavy with the latter. Warehouses are pressing for heavier flat-rolled, notably 3/4-inch and under. Because of extended mill shipments, drain on distributor's stocks is heavy. Trend toward oil for domestic heating accounts for increasing requirements and eventually more bulk storage and distributing lines will be needed.

Philadelphia—District plate producers again are falling behind on commitments because of active demand and production difficulties resulting from pig iron and scrap scarcity. One eastern mill estimates that arrearages will be so heavy by the end of the year that they will require entire first quarter to run off, and some other mills are in no better position.

Contributing to the present scarcity are government allocations for the four-month export program, which begins this month, with plates believed to be the largest single item, and directives for supplying in November and December of plates necessary for 1100 urgently needed tank cars to be built by American Car & Foundry Co., New York.



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About 30,000 tons of rolled steel will be required, it is estimated, with wide plates by far the principal item. The cars are understood to be for government account.

**Birmingham** — Reports indicate plate mills are not making headway in clearing off backlogs even though operations have continued at capacity despite iron and scrap shortages. Some diversion of ingots to other pressing items has accounted for retention of large plate backlogs, despite the fact that shipbuilding, on the whole, has eased considerably.

**Seattle** — While some small shops report less inquiry for items requiring plates, fair tonnages for tanks are under contract. Some larger projects are pending. Puyallup, Wash., took bids Nov. 27 for two million-gallon water tanks and Portland will receive tenders Nov. 6 for an elevated ½-million gallon tank for the Sellwood district. Seattle has rejected bids for and indefinitely postponed the Bow Lake water extension project involving 5000 tons of plates. Low bid was \$1,621,000, city's estimate \$1 million. Plans will be revised on a smaller scale.

Dulien Steel Products Inc., Seattle, is high bidder on 9300 tons of new steel ship plates sold by the Oregon Shipbuilding Co., Portland, Ore. This is the last remaining parcel left over from the yard's shipbuilding operations. The purchaser plans to place this material on the market.

**Structural Shapes . . .**

*Restrictions hold back much construction; mills have large backlogs despite curb on non-housing work*

Structural Shape Prices, Page 157

**Boston**—With the letting of the largest postwar contract, 17,000 tons by Stone & Webster Engineering Corp., Boston, for a generator assembly building at Schenectady, N. Y., and closing of most pending tonnage projects, active inquiry for fabricated structural steel has declined. With the exception of two small two-span bridges in Connecticut, closing Nov. 12, bridge inquiry is absent. One of these bridges will be welded frame. American Bridge Co., Pittsburgh, will fabricate 245 tons for a New Haven railroad bridge, Cedar Hill district, New Haven Conn., and the same contractor, Mariani Construction Co., placed 835 tons for a steel girder viaduct at Hamden, Conn., with Electric Boat Co., New London, Conn., probably the heaviest individual tonnage yet booked by this shipyard since entering the structural steel fabricating field. E. B. Badger & Sons Co., Cambridge, Mass., bought 300 tons for an oil refinery at Baytown, Tex., from Lackawanna Steel Construction Co. While most power plants will go ahead, high costs and difficulties in procurement are causing some postponements in industrial construction. Structural mills are experiencing only slight easing in pressure for plain material and miscellaneous demand for smaller sizes holds.

**New York** — With the virtual termination of the truckers strike, heavy type building construction was resumed last

week after having been brought almost to a dead halt for several weeks because of inability of builders to obtain steel and other working materials. Meanwhile, new structural buying continues limited, although 3035 tons for the Herald Tribune addition, 219 West 40th St., New York, has been placed with American Bridge Co. CPA restrictions, combined with the uncertain outlook with regard to building costs, are the principal factors in the present downward trend in structural demand.

Decline in business is reflected in the report just issued by the American Institute of Steel Construction for September. Contracts closed in that period amounted to 113,658 tons, as against a revised figure of 164,728 tons in August.

Shipments also declined in that month, amounting to 135,835 tons against 152,944 tons.

Total bookings for the first nine months amount to 1,382,672 tons, against 1,094,869 tons as an average for the same period in the five prewar years, 1936 to 1940, inclusive, an increase of 26.3 per cent. Shipments during the first nine months of this year totaled 1,073,085 tons, practically the same as the average of 1,074,154 tons for the same months in the five prewar years. Tonnage available for fabrication within the next four months amounted to 682,332 tons, against 362,278 tons, the average for the five prewar years.

**Birmingham**—Shape shortages have held up some construction, although re-

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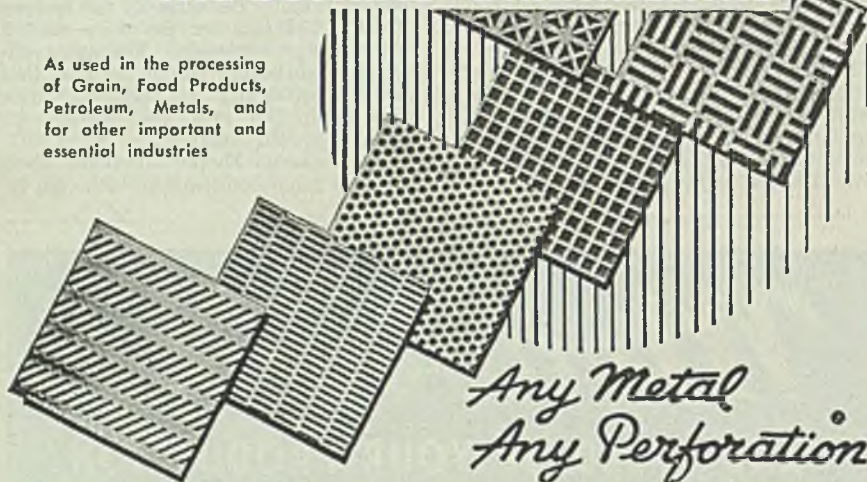
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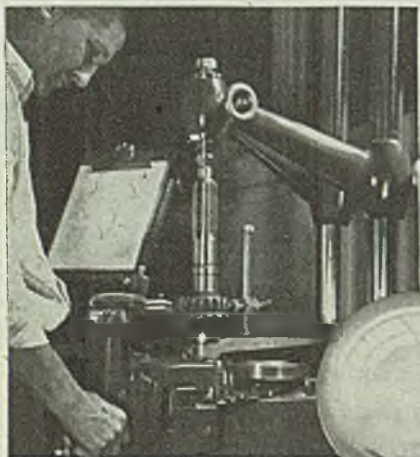


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ports are that considerable building has been held in abeyance until sponsors see the future more clearly. Pressure for shapes is reported not as great as it was a few months ago.

Seattle—Fabricating shops report no improvement in position and steel is extremely scarce. While some shipments are being made overland, important tonnages are still delayed en route by interruption of water service. Much new business is offered but fabricators can not commit themselves. Contracts of immediate importance or an emergency nature are being taken where only small tonnages are involved. Many jobs partially completed await additional material. Local inventories are practically exhausted. Bureau of Reclamation, Denver, has called bids Nov. 19 for structurals for the Jeness, Idaho, Payette project pumping plant.

## Reinforcing Bars . . .

Reinforcing Bar Prices, Page 157

Boston — Except 450 tons for a two-story plant for G. F. Heublein & Bros. Inc., Hartford, Conn., most of 4350 tons of concrete reinforcing bars placed here are for construction outside New England. Scherer Steel Co. took the Heublein tonnage; 3500 tons for a generator assembly plant at Schenectady, N. Y., goes to Bethlehem Steel Co. Tonnage contracts for bars are placed with difficulty, distributors being reluctant to commit ahead in view of light production and inventories. Nevertheless scattered small lots are available in low alloy grades commanding substantial premium over regular reinforcing grades; contractors badly in need of bars to maintain construction schedules are paying the higher price in some cases.

Pittsburgh — As long as reinforcing bars remain a "loss" item there is little prospect overall output will be substantially increased, for most integrated steel producers will continue to allot only a limited amount of steel. One interest has not booked any new business for some time as order backlogs are even now extended through most of first quarter on basis of present production. Shortage of rerolling rails prevents rerollers from increasing operations above 50 to 60 per cent. Many proposed construction programs have been temporarily shelved, due to extended deliveries and uncertain price outlook. OPA is said to be considering decontrolling prices for fabricated bars.

Seattle — Reinforcing is in strong demand but many projects are being postponed because of inability to obtain material. At Longview, Wash., for the third time no bids were received for construction of three concrete buildings for Bonneville Power Administration and the project is indefinitely postponed. Reinforcing tonnages pending include a concrete girder bridge and approaches. East 34th St., Tacoma, Wash., Guy F. Atkinson Co., Seattle, low at \$405,791.

## Tubular Goods . . .

Tubular Goods Prices, Page 157

Pittsburgh — No easing in demand is noted for standard steel pipe and no relief is anticipated until well into 1947 at earliest. More than 300,000 tons of butt-weld steel pipe were shipped to plumbing and heating distributors last

quarter, or almost three times the NHA's state requirements of 116,000 tons. However, builders with HH ratings have complained of inability to obtain adequate tonnage. CPA is looking into this problem and if investigation shows that HH-ratings have been disregarded by distributors, it might be necessary to impose an indefinite "set aside" on distributors' stocks. Producers are against any effort to extend HH-ratings to mill level for it would result in less overall production.

**Cleveland**—A slight improvement in pipe supplies is noted here, some direct shipment orders having been moved from fourth quarter to third. Several sellers report current shipments, chiefly to jobbers, are on schedule, indicating that quotas in the future will not be reduced to take care of arrearages. A report by the Civilian Production Administration shows that steel pipe producers shipped about three times the housing and utilities requirements of butt-weld to distributors during third quarter. They shipped more than 300,000 tons of such pipe to plumbing and heating distributors during that period, compared with NHA estimated requirements of only 116,000 tons. However, builders with HH ratings still complain of inability to get butt-weld pipe.

**Seattle** — Cast iron pipe sellers are marking time. Shipments are delayed by the maritime strike and deliveries are indefinite. Potential demand is large but much is held back. Practically all pipe for the Pacific Northwest comes by water. Local inventories are negligible.

### Pig Iron . . .

*Relighted furnaces and premium payments bring some easing; rated tonnage is factor in foundry melt*

Pig Iron Prices, Page 159

**New York** — Pig iron sellers here report that their November quotas of rated tonnage are on a close parity with those of October. Also, they anticipate that foundries in this district will melt about as much iron as in October, despite the fact that November will have two less working days, being a shorter month and having the Thanksgiving holiday.

They ascribe this possibility to the fact that the movement of pig iron will not only be facilitated by the ending of the trucking strike in the metropolitan area but also by a heavier pig iron production. An extra furnace has gone into blast in Buffalo and the New England producer is expected to get into operation around the middle of this month, thus easing the pressure on some producers who might have more tonnage available for this district as a result.

With deferment of the threatened soft coal strike until at least Nov. 20 and with the ending of the maritime strike resulting in a spurt of coal deliveries, the coke situation appears less menacing. Coke is expected to remain in short supply for some time, but the threat of an early sharp curtailment in existing production has been set back for at least the time being.

**Pittsburgh** — The local merchant pig iron interest reports an insignificant re-

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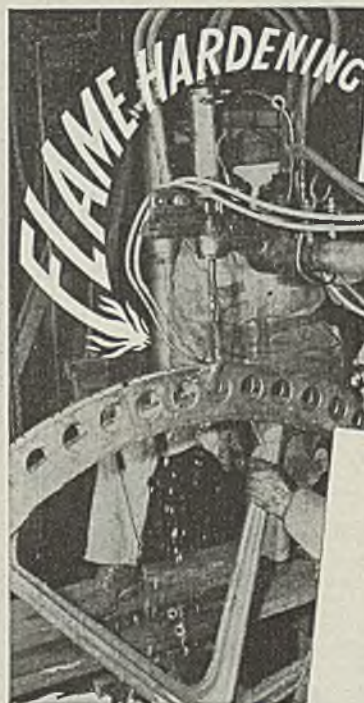


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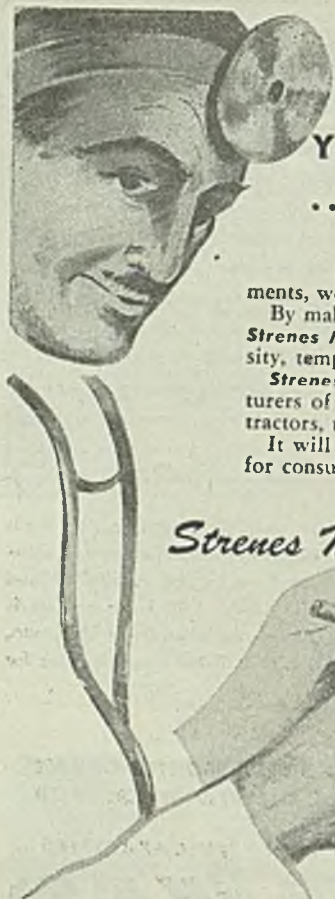
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duction in priority tonnage obligations for November, which means that many of its customers must continue operating on a reduced basis through this period and rest of quarter, from all indications. Critical pig iron supply is expected to continue for some time, although it is hoped some relief soon will result from the premium payment plan for boosting output of foundry and malleable iron.

**Boston** — November will be the most critical month in the pig iron shortage, with additional closings and curtailments reducing overall melt as numerous melters also reach the end of the string on scrap. Shortages in castings, already serious, will continue through balance of this year, although more iron will be coming through by December from Everett. Initial production by the Mystic furnace will be spread so thin through emergency shipments, few foundries will acquire satisfactory inventories before first of next year. Probably less than 25 per cent of the New England melt is rated tonnage and most of the larger consumers do not qualify. Some effect of certifications has been to disrupt distribution of limited supply.

**Philadelphia**—While rated specifications for November average about the same as for October, pig iron sellers assert that in some instances there have been rather substantial reductions, indicating that previous allotments were actually too heavy. Little relief is noted for foundries engaged in nonrated business, nor for consumers of basic, who continue to operate on a restricted basis because of insufficient pig iron and scrap. However, the position of foundries with regard to coke is somewhat better, as foundry beehive coke is beginning to move into this district. Position of consumers of furnace coke is as unfavorable as ever.

**Chicago** — Prospects for increased merchant iron production in this district have brightened with the sale by WAA to Inland Steel Co. of the surplus blast furnace plant. In connection with the deal, Inland agreed to supply between 20,000 and 24,000 tons per month of merchant iron for the veterans' housing program so long as it qualifies for the \$8 per ton subsidy. Production is not likely to start, however, until the Department of Justice has approved the sale or until it is determined whether there is going to be a coal strike. Offsetting this favorable outlook is the report that a blast furnace of Granite City Steel Co. has lost its big bell and has gone down for repairs. Foundries continue on a hand-to-mouth basis for iron, coke and scrap, and are unable to make inroads on their voluminous casting order backlog.

**Buffalo** — While ore stocks are considered favorable at this time, the coke situation is becoming more of a problem. Pig iron sellers report a slight easing in iron demand this week. In line with this, some foundries find coke shortages are checking expanded melt as much as limited iron supplies. Although pressure for delivery was not quite as great, demand still exceeds available supplies. Producers are asked to cope with increased tonnages being allocated to New England consumers.

**Cincinnati**—Foundries continue pressure for more pig iron without success although there are some interests who look for more liberal furnace allotments through augmented output from in-

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November 4, 1946

tive production. Despite a sustained demand for castings, in excess of production, the melt remains fairly constant with supplies of pig iron, coke and scrap acting as a governor.

**Birmingham** — Pig iron demand continues highest this district has ever known. Even with lighting of the Gadsden stack by Republic Steel Corp., the overall situation will not be materially eased, according to local opinion. Foundries are booked heavily, a great deal of it on products new to the district and there is slight prospect that they will get the iron they need for full production at anything like an early date.

**Seattle** — Pig iron is hard to get. Provo is reported idle and Geneva is about a month behind orders. Foundries generally are fairly busy and pig is in good demand, prices unchanged. While cast iron scrap is not tight, in some instances foundries are having difficulty in obtaining desired grades. Not much relief in the pig iron situation is expected before 1947.

**Relighted Furnaces To Make Iron for Housing Program**

Blast furnaces to go into operation under the premium payment plan of the veterans emergency housing program are Mystic, Everett, Mass., Republic furnace at Troy, N. Y., which will supply iron for New England, and Inland Steel Co. stack at East Chicago, Ind., to take care of requirements in the middle west. The government-owned stack at Gadsden, Ala., leased to Republic Steel Corp., already has started production for the housing program.

Mystic furnace has been closed since the end of the war and, defined as a closed plant, will receive \$12 per ton bonus. The Troy furnace, which traditionally produces low phos iron, will shift immediately to foundry and malleable one month out of four or five. It will receive \$8 per ton bonus. As a result of the sale of a government-owned stack at East Chicago Inland Steel Co. will use another of its furnaces to produce foundry and malleable iron for the housing program. Output is expected to be 20,000 to 24,000 tons monthly.

**Scrap . . .**

*Little improvement shown in supply, with most users on depleted inventories; yards not interested*

Scrap Prices, Page 160

**Philadelphia**—The scrap situation is worse at most points. One district mill consumer has had to suspend all rolling operations for the past two weeks because of difficulty in obtaining raw material, particularly scrap. One leading consumer, which recently canceled all contracts for low phos for open hearth use because of inferior quality of material received, is now making another effort in this direction, having just entered contracts for a limited tonnage.

**New York**—Upgrading of steel scrap continues and were it not for premiums thus obtained, movement of material would be relatively negligible, it is

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claimed. Even as the situation stands less scrap is moving now than recently and in no important cases are consumers able to build up backlogs for winter.

**Boston** — Substantial ratio of scrap now moving is upgraded; much of the heavy melting is low phos in billings, thus commanding the \$2.50 premium, and some sharp corners are also cut in cast transactions. Scrap consumers are suspended from jaws of pinchers and with ratio high in melts because of lack of pig iron, tonnage is accepted which normally would be rejected. Under inventory control, if enforced, some yard scrap must begin to move more heavily soon; Nov.-Dec. shipments will be compared with October receipts in the first report to CPA Jan. 5, and incoming tonnage the latter month in some cases has been withheld.

**Buffalo** — Resentment toward controls continues to mount in the scrap trade. Furthermore, upgrading is becoming common practice. Dealers report sales within OPA compliance are virtually absent. The trade scoffs at OPA regulations aimed at quickening the movement of scrap and inferring that dealers are hoarding material. Mills are rushing in a couple of late boatloads from up the lakes. A 5600-ton load arrived from the Duluth section this week.

**Chicago** — In spite of the fact that the government has made it clear it does not intend to decontrol iron and steel scrap because demand is far in excess of supply, the volume of material offered and available is not improving. Considerable holding of material for higher price has been evident in recent weeks, and the tendency continues. Individually, some steel mills have been getting in fair volume through their own initiative, in some cases putting a little down in stock, nevertheless none are close to the 45-day inventory maximum imposed by CPA.

**Cincinnati** — Flow of iron and steel scrap has developed a moderate increase, but insufficient to relieve the supply situation melters are facing with approach of winter. Some major interests have a two-weeks inventory, others on virtually a day-by-day basis. All grades are inadequate, with scarcity of cast creating most clamor. Collection and preparation undoubtedly reflect dissatisfaction with prices.

**St. Louis** — Scrap shipments continue low. Mills that accumulated substantial reserves during a long strike shutdown last summer now find themselves down to three weeks or less. Currently their only recourse is to press their steel customers unusually hard for direct return of scrap, a method which is bringing in a little extra tonnage. Railroad metal still is brokers' main source. Foundries' recent critical shortage of cast is abating somewhat but the prospect of adequate reserves still is remote.

**Birmingham** — The best that can be said of the scrap situation is that it is probably no worse. Brokers declare the market can do little other than improve from a supply standpoint. Scrap is virtually unobtainable, although a gradual accumulation mostly of unwanted items is evident on local yards.

**Seattle** — Steel scrap buyers generally are pleased by the new order restricting inventory to 45 days, although some mill owners believe a 45-day supply is not enough. The directive is expected to bring to market considerable tonnage that has been held back in the hope

of higher prices. Mill representatives are scouring all possible sources of supply and making every effort to stimulate shipments. One local plant is reported to have a 45-day supply on hand, another not to exceed a week.

### Keystone Upheld in Scrap Plea; OPA Restrained

Office of Price Administration has been restrained from enforcing a recent amendment prohibiting the sale of iron and steel scrap in return for fabricated steel products.

Keystone Steel & Wire Co., Peoria, Ill., was granted a temporary injunction in federal court in a suit attacking the validity of the amendment. The company stated that for years it has operated under agreements with its suppliers of scrap to supply them in turn with fabricated steel products. Should these agreements be terminated by the OPA edict, the company said it could not obtain the scrap necessary for its operations.

Judge J. Leroy Adair held "the power assumed by the OPA in the amendment was not authorized by the price control act." The amendment was issued to control distribution of iron and steel, the court said, and pointed out that the price control agency at no time has been given power to control distribution.

### Warehouse . . .

Warehouse Prices, Page 158

**New York**—Although delivery on some tonnage is nearly three months behind and orders have backed up in large volume because of the trucking strike, now settled, cancellations are absent, reflecting urgent need of steel on part of consumers buying from distributors. In most cases, consumers are being sounded as to the status of delinquent volume and delivery is requested practically 100 per cent. Inventories with most warehouses have not improved, most tonnage being earmarked against orders during the tie-up, although in a few products mill quotas are holding this quarter. On shapes, allocations have been increased in some instances. New orders naturally slackened during the strike, but inquiry has snapped back to the former high level.

**Cincinnati**—Mill shipments to warehouses declined last month, direct cause for tapering in jobbers' sales volumes. Priority orders to mills, adversely affecting shipments to other users, have likewise created an upturn in demand on warehouses which, in face of unbalanced and lighter stocks, they are unable to meet.

### Rails, Cars . . .

Track Material Prices, Page 157

**New York** — Broad application of directives for car steel is still hanging fire, with the question not likely to be settled definitely for another two weeks, according to some leading producers. There is a shortage of cars and pressure for more steel not only for new construction but for repairs is heavy. However, plates, especially light gages, bars and light shapes are in urgent demand in other directions. For instance, there are large steel commitments for abroad, most

of long standing, and on which only within the past few weeks new and lower quotas have been set up, covering a period of four months beginning with November. Consequently, much of it settles down to a question of shifting emphasis and decision has to be arrived at carefully.

Pittsburgh — Expected CPA action of issuing steel mill directives covering requirements for construction of 21,000 new domestic freight cars over a three months' period is still pending. Preferred tonnage directives now proposed for freight car construction have been drastically reduced from the original plan for repair of 80,000 freight cars and construction of 40,000 new ones. Foreign freight car programs continue to absorb a large portion of total steel available to freight car builders. The French car program, aggregating 36,750 cars, is not expected to be cleared up until end of first quarter. Despite the fact railroad efficiency is higher than ever before, the current critical car shortage is expected to continue well through 1947. It is estimated the railroads are transporting only 85 per cent of the freight that would be offered for shipment if cars were available.

**Canada . . .**

Toronto, Ont. — Canadian steel mills gradually are returning to more normal production and should reach prestrike operations about the middle of November. However, there has been only minor easing in steel supply, entirely due to large shipments recently by Steel Co. of Canada Ltd., from its Hamilton works and most other rolling departments are operating, although pig iron production has been cut to enable relining of two furnaces. Algoma Steel Corp. and Dominion Steel & Coal Co. have resumed operations on a minor scale but are gradually stepping up as arrangements can be made for return of more workers. Canadian industry is still dependent on United States steel to maintain operations and imports are said to be gaining in volume, but it is pointed out that the Canadian government has not made provision to take care of the higher priced steel reaching this country from the States and manufacturers have been required to absorb additional costs as there has been no lifting of ceiling prices on finished articles.

Iron and steel production in Canada in August registered a new monthly low for more than 10 years as a result of the strike. Following are comparisons in net tons:

	Steel ingots, castings	Pig Iron	Ferro-alloys
August, 1946	88,729	46,494	6,103
July, 1946	135,914	64,472	6,243
August, 1945	224,928	139,812	15,668
8 Mos., 1946	1,674,282	986,989	81,247
8 Mos., 1945	2,049,707	1,232,162	130,090
8 Mos., 1944	1,993,756	1,266,979	124,558

**STRUCTURAL SHAPES . . .**

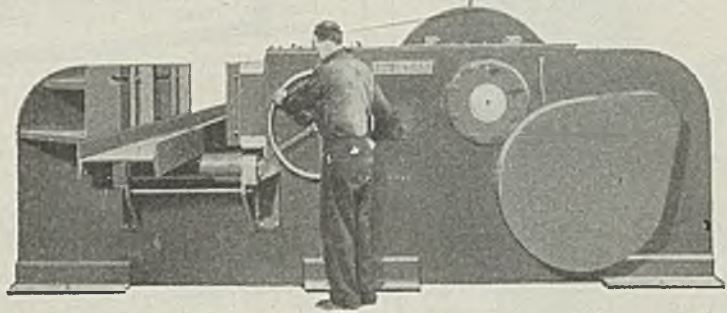
**STRUCTURALS PLACED**

8035 tons, Herald Tribune addition, 219 West 40th St., New York, through Lockwood Green Co., New York, to American Bridge Co., Pittsburgh.

1100 tons, building, Standard Brands, Terre Haute, Ind., through Luria Engineering Co., New York, to G. L. Mesker & Co., Evansville, Ind.

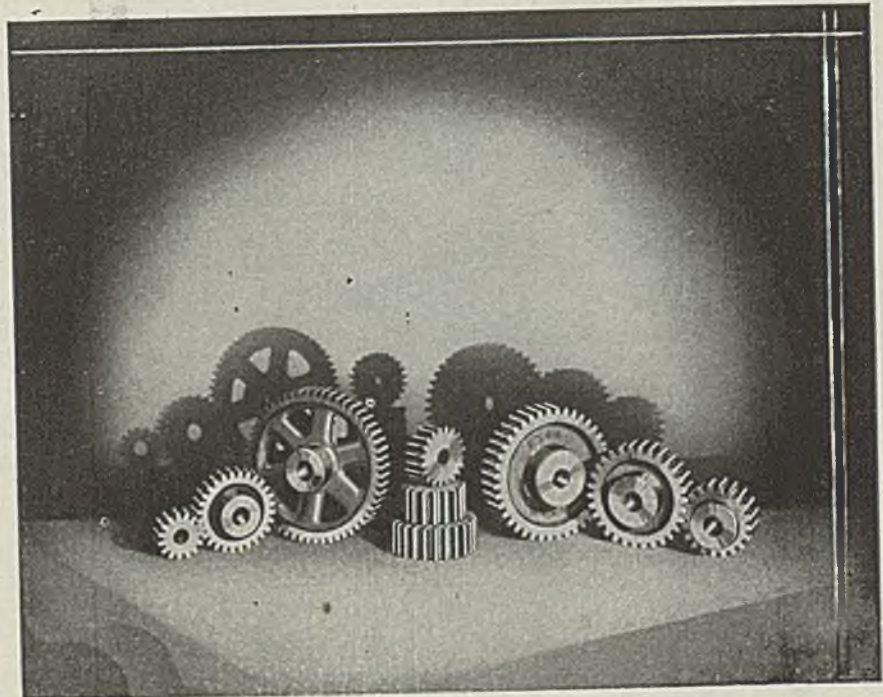
1100 tons, building, Beloit, Wis., for Fairbanks, Morse & Co., to Bethlehem Steel Co., Beth-

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800 tons, rock wool plant, Alexandria, Ind., for National Gypsum Co., to Duffin Iron Works, Chicago.

600 tons, warehouse, Champion Paper Co., Pasadena, Tex., to Virginia Bridge Co., Roanoke, Va.

510 tons, Union Carbide & Carbon Co., Texas City, Tex., to Chicago Bridge & Iron Co., Chicago.

485 tons, coke plant, Whiting, Ind., for Standard Oil Co. (Indiana), to American Bridge Co., Pittsburgh; Lummus Co., Chicago, contractor.

380 tons, stoker building for Lehigh Navigation Coal Co., Tamaqua, Pa., to Bethlehem Contracting Co., Bethlehem, Pa.

325 tons, water mains, Rockaway Boulevard, Brooklyn, through Turfano Construction Co., New York, to Alco Products Co., New York.

325 tons, oil refinery, Humble Oil Co., Baytown, Tex., to Lackawanna Steel Construction Co., Buffalo, N. Y.; E. B. Badger & Sons Co., Cambridge, Mass., engineer-contractor.

300 tons, veterans' hospital buildings and utilities, Providence, R. I., to Providence Steel & Iron Co., Providence; E. Turgeon Construction Co., Providence, general contractor.

245 tons, bridge, New York, New Haven & Hartford railroad, Cedar Hill district, New Haven, Conn., to American Bridge Co., Pittsburgh; Mariani Construction Co., New Haven, general contractor; Bethlehem Steel Co., Bethlehem, Pa., awarded 45 tons reinforcing bars.

200 tons, factory building, Michigan City, Ind., for Michiana Products Co., to American Bridge Co., Pittsburgh; Tonn and Blank Co., Michigan City, Ind., contractor.

130 tons, state bridge in Carbon county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.

115 tons, boiler plant, Monsanto Chemical Co., Springfield, Mass., to Belmont Iron Works, Philadelphia, Pa.; Adams & Ruxton Construction Corp., Springfield, general contractor.

105 tons, dormitory, New England Baptist hospital, Boston, to Lehigh Structural Steel Co., Allentown, Pa.

### STRUCTURAL STEEL PENDING

6500 tons, manufacturing building, Kansas City, Kans., for Sunshine Biscuits Inc.

4500 tons, superstructure, Anacostia Bridge, Washington; bids opened Oct. 31.

1820 tons, transmission towers, Lexington, Ky., for Kentucky Utilities Co. Inc.

1200 tons, rolling mill building, Kokomo, Ind., for Haynes Stellite Co.

500 tons, bulk plant, Springfield, Ill., for Pillsbury Mills Inc.

500 tons, bridge contract No. 6, Arlington, Va.; bids asked.

400 tons, storage building, Baton Rouge, La., for Solvay Process Co.

350 tons, scale frame, St. Louis, for Eagle Iron Works.

340 tons, Tuckahoe state bridge, Maryland; Tidewater Construction Corp., Norfolk, Va., low bidder.

300 tons, state bridges, Manchester and Hamden, Conn., latter twin span welded steel frame with two skew spans of 45'-3"; Manchester two-span rolled beam bridge with skew span of 108'-2"; bids Nov. 12, Hartford.

200 tons, underpass, Kurtz, N. D., for state; bids Oct. 28.

150 tons, boiler plant, Smith college, Northampton, Mass.; George A. Fuller Co., Boston, general contractor.

Unstated, pumping plant Payette division, Jeness, Idaho; bids to Bureau of Reclamation, Denver, Nov. 19.

## REINFORCING BARS . . .

### REINFORCING BARS PLACED

3500 tons, generator assembly plant for General Electric Co., Schenectady, N. Y.; to Bethlehem Steel Co., Bethlehem, Pa.; Stone & Webster Engineering Corp., Boston, engineer-contractor.

450 tons, two-story building, G. F. Heublein & Bros. Inc., Hartford, Conn., to Scherer Steel Co., Hartford; Wadhams & May Co., Hartford, general contractor.

335 tons, oil refinery, Humble Oil Co., Baytown, Tex., to Pecora Iron & Steel Co., Houston, Tex.; E. B. Badger & Sons Co., Cambridge, Mass., engineer-contractor.

320 tons, store building, Evanston, Ill., for Maurice L. Rothschild, to Joseph T. Ryerson & Son Inc., Chicago, R. C. Wieboldt Co., Chicago, contractor.

200 tons, administration building, Chicago, for University of Chicago, to Joseph T. Ryerson & Son Inc., Chicago; W. J. Lynch Co., Chicago, contractor.

### REINFORCING BARS PENDING

750 tons, Southwest Side intercepting sewer, contract No. 12, for Sanitary District of Chicago; Santucci Construction Co., Chicago, low on general contract; bids Oct. 24.

700 tons, veterans hospital, Sioux Falls, S. D., for Veterans Administration; original bids rejected, new bids Nov. 19.

260 tons, mill room addition, Chicago, for Dryden Rubber Co.; bids Nov. 4.

100 tons, addition, Spring Valley, Ill., for St. Margaret's hospital; T. S. Willis, Janesville, Wis., contractor; bids Oct. 4.

Unstated, water filtration plant, Port Washington, Wis.; bids Oct. 30.

Unstated, new plant, Chicago, for Aldens Inc., A. Epstein, engineer; bids Nov. 1.

Unstated, East 34th St. concrete girder reinforced bridge, Tacoma, Wash.; Guy F. Atkinson Co., Seattle, low at \$408,791.

Unstated, three concrete buildings including boiler house, for Zellerbach Paper Corp., Seattle; general contract to Austin Co., Seattle.

## PLATES . . .

### PLATES PLACED

1550 tons, six tanks, Gulf Oil Refining Co., Pittsburgh, to Bethlehem Steel Co., Bethlehem, Pa.

### PLATES PENDING

Unstated, two million-gallon elevated steel tanks, Puyallup, Wash.; bids Nov. 27.

Unstated, ½-million-gallon steel tank for Sellwood district, Portland, Ore.; bids Nov. 6.

Unstated, Bow Lake pipe line, Seattle; bids involving 5000 tons rejected; plans will be redesigned; bids later.

## RAILS, CARS . . .

### RAILROAD CARS PLACED

Union Pacific, 1000 seventy-ton hopper cars of Rodger ballast design, to Madison, Ill., plant of American Car & Foundry Co., New York.

### RAILROAD CARS PENDING

Cudahy Packing Co., 200 forty-ton refrigerators.

New York, New Haven & Hartford, 27 sleepers, New York, New Haven & Hartford, 27 sleepers, lightweight with stainless steel exteriors for the Owl and Federal Express.

### RAILS PLACED

Erie, 25,337 tons, divided between two eastern producers; includes 10,029 tons 131-pound and 15,308 tons 112-pound rails.

### LOCOMOTIVES PLACED

Clinchfield, four 4-6-6-4-type steam locomotives, to American Locomotive Co., New York.



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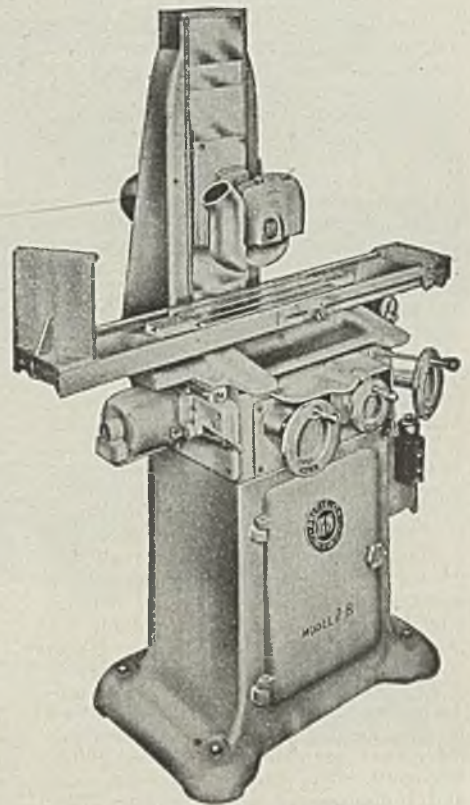
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## Nonferrous Metals . . .

Nonferrous Prices, Page 162

New York—Office of Price Administration and Civilian Production Administration continue to maintain strict domestic controls over principal nonferrous metals, despite trend toward free markets. Supplies are still below demand. However, sales and deliveries of several metals and minerals when sold by the Reconstruction Finance Corp. or its subsidiaries for export have been exempted from price control, effective Oct. 24. These are: Antimony metal and oxide, copper, lead, nickel, zinc, manganese ore, corundum, asbestos, and quartz crystals.

United States Bureau of Mines reported last week that dealers' stocks of nonferrous scrap metals at the end of August were the largest ever reported at 205,835 tons. Receipts during that month totaled 126,230 tons, an increase of 39 per cent over July. The largest percentages of increase were shown in receipts of aluminum and zinc scrap.

Zinc—Starting this month all six grades of zinc will be released from government stocks. For two months, only high-grade zinc was available for release because the other five grades were located at strikebound refineries.

An increase of 1 cent a pound in producers' ceiling prices of zinc contained in zinc anodes and special shapes, primary and secondary zinc base alloys, zinc dust, wire, and battery cans, sides and bottoms was authorized by OPA, effective Oct. 31.

A plea by the Tri-State Concentrate

Smelter Industry Advisory Committee for further assistance through increased subsidy payments is being considered by government agencies concerned.

Lead—Because of the acute lead shortage, no allocations of this metal will be made to newcomers in the automotive replacement battery manufacturing industry in fourth quarter.

Copper—A ceiling price increase of 13½ per cent for bronze and copper insect screen cloth, averaging about 71 cents per 100 square feet, was announced by OPA last week. Civilian Production Administration has placed inventories of copper scrap and copper-base alloy scrap under controls similar to those governing iron and steel scrap. Direction 11 to priorities regulation 12 provides that scrap dealers and brokers must limit inventories to the tonnage they expect to ship in the succeeding two months. Where the dealer or broker fails to maintain the anticipated rate of shipment, reports on inventory and shipping positions must be filed with the Copper Branch, beginning Jan. 5 and monthly thereafter.

Tin—An increase in the amount of tin permitted in production of babbitt used in bearings is permitted. The action was taken because lead and antimony shortages are threatening the bearing industry, and not because of any increase in the supply of tin. The order permits an unlimited tin content for the manufacture, repair, maintenance or replacement of multivane crosshead linings in locomotives or for lining aluminum crossheads and up to 90 per cent tin content, for all other bearing purposes.

## CONSTRUCTION AND ENTERPRISE

### CALIFORNIA

GLENDALE, CALIF.—Williams Radiator Co., 1821 Flower St., has let contract to Buttress-McClellan Co., 1013 East Eighth St., Los Angeles, for a CPA-approved one-story plant building, to cost about \$30,000.

LOS ANGELES—Davallo Tool & Die Co. has been formed by Manuel J. Davis and associates and has established operations at 1444 North Spring St.

LOS ANGELES—Accuracy Screw Machine Products Co. has been formed by Ted Mallish and Paul W. Green and operations have been established at 6200 South Main St.

LOS ANGELES—Apex Steel Corp. Ltd., 6111 South Eastern Ave., has bought 10½ acres at 6920 East Slauson Ave., where 31,200 square feet of manufacturing space is being developed.

LOS ANGELES—Bakewell Aircraft Products Co., 2427 East Fourteenth St., is building a plant covering 28,000 square feet to be devoted to manufacture of hydraulic door check hinges, tool holders, quick couplings and aircraft parts.

### IDAHO

BOISE, IDAHO—State received bids Nov. 1 for road projects in Shelby and Bonner counties, involving reinforcing bars, metal pipe, corrugated metal siphons and other materials.

### ILLINOIS

LOCKPORT, ILL.—Material Service Co., 33 North LaSalle St., Chicago, has let contract to J. Schmiedl, Aurora, Ill., for a machine shop building to cost about \$80,000.

### INDIANA

ANDERSON, IND.—Nicholson File Co., Lynn and 34th Sts., is taking bids on a power plant to cost about \$75,000.

### MARYLAND

BALTIMORE—Heatmasters Inc., William B. Rogers, president, 1811 Lovegrove St., has been organized to manufacture automatic heating units using pulverized coal.

BALTIMORE—Westinghouse Electric Corp., 2519 Wilkens Ave., will build four structures for storage of X-ray equipment, two of 40 x 200 feet and two of 40 x 100 feet.

### MICHIGAN

DETROIT—Cavalier Spring Co. Inc., 670 Henry St., has been incorporated with \$10,000 capital to manufacture metal springs, by Paul Cavalier, same address.

DETROIT—Grove Products Corp., 24435 Gratiot avenue, East Detroit, has been incorporated with \$75,000 capital to manufacture machinery, by Leroy K. Grove, 2267 Cambridge Ave., Berkley, Mich.

DETROIT—Lawton Hoist & Mfg. Co., 5766 Lawton Ave., has been incorporated with \$10,000 capital to manufacture hoists, by Roswell B. Ybema, 8510 Greenlawn Ave.

DETROIT—Oltman-O'Neill Co. Inc., 5171 Martin Ave., has been incorporated with \$100,000 capital to manufacture truck bodies, by Leslie M. Oltman, 1440 Balfour Rd., Grosse Pointe Park, Mich.

ROSEVILLE, MICH.—Roseville Engineering & Mfg. Co., 28500 Utica Rd., has been incorporated with \$10,000 capital to manufacture machine parts, by William C. Bohnbhoff, same address.

VAN DYKE, MICH.—N & S Metal Products Co., 20769 Mound Rd., has been incorporated with \$50,000 capital to manufacture tools, parts, machines and engines, by Frank J. Noder, 12330 Whitehill Ave., Detroit.



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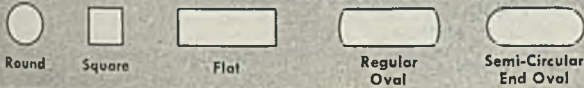
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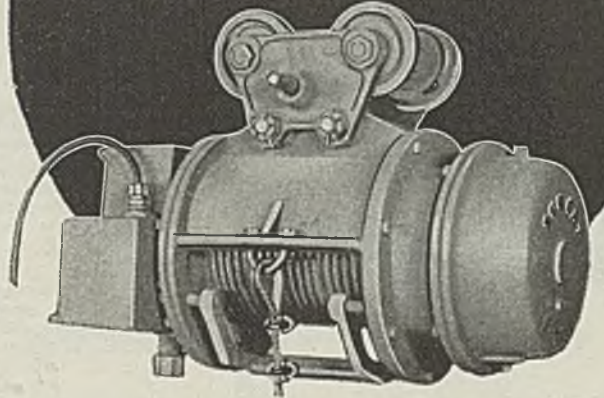
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## MINNESOTA

ST. PAUL—Waldorf Paper Products Co., 2236 Myrtle Ave., has let contract to Fuel Economy Engineering Co., 510 New York Life Bldg., for a steam generating unit and power plant improvements, to cost about \$300,000. Helmich, Edeskuty & Lutz, 412 Essex Bldg., Minneapolis, are engineers.

## MISSOURI

MARSHALL, MO.—Board of Public Works has let contract to Ebbe Construction Co., Trenton, Mo., for a one-story 42 x 117-foot power plant building and alterations to present building, to cost \$272,000. Black & Veatch, 4706 Broadway, Kansas City, Mo., are consulting engineers.

ST. LOUIS—Monsanto Chemical Co., 1700 South Second St., has let contract to Fruin-Coburn Contracting Co., 1700 Olive St., for two additional buildings at its plant at Second St. and Lafayette Ave.

ST. LOUIS—Majestic Mfg. Co., 2134 Delmar Blvd., has let contract to L. O. Stocker Co., 812 Olive St., for a one-story 300 x 400-foot plant and office building at 3900 Neesho St. H. K. Graf, 2825 Olive St., is architect.

ST. LOUIS—Century Electric Co., 1806 Pine St., will let contract soon for a six-story 75 x 130-foot and five-story 109 x 180-foot additions at Nineteenth and Chestnut streets.

## OHIO

ALLIANCE, O.—Alliance Metal Products Co. has been incorporated with \$25,000 capital to manufacture metal products, dies, jigs, fixtures and farm equipment, by C. P. Galant, Park and Patterson Sts.

CLEVELAND—Soil Tools Inc. has been incorporated to manufacture farm tools and equipment, by Fred O. Burkhalter, attorney, 1425 Guardian Bldg.

CLEVELAND—Ohio Public Service Co., Hanna Bldg., R. E. Burger, president, announces construction program involving about \$37 million; principal units are additions to generating stations at Bellaire and Lorain, O., and improvements to stations at Warren, Marion and Mansfield, O.

PAINESVILLE, O.—Upson Machine Products Inc. has been incorporated with 300 shares no par value, by Ross G. Sweet, 33 Johnson Bldg., attorney, and associates.

YOUNGSTOWN — Commercial Shearing & Stamping Co., 1775 Logan Ave., C. B. Cushwa, president, will build addition to its hydraulic machinery department, to cost about \$290,000.

YOUNGSTOWN — Commercial Shearing & Stamping Co., C. B. Cushwa, president, has CPA approval and will build as soon as possible a \$290,000 addition to its hydraulic machinery department. Plant will be 100 x 180 feet.

## OREGON

BEND, OREG.—Bend Iron Works, C. J. Dugan, owner, has let contract for a machine shop addition 30 x 100 feet.

EUGENE, OREG.—City water board has instructed engineers to prepare plans for proposed addition to Leaburg power plant, doubling capacity to 42,000 kv, at cost of \$563,000; plans are also being made for a generator unit and eight miles of transmission line.

POTLAND, OREG.—Zidell Machinery & Supply Co. has bought 16 acres in Guilt Lake district and plans expansion of operations.

## PENNSYLVANIA

MEADVILLE, PA.—Talon Inc., 939 West 26th St., Erie, Pa., has let contract to George A. Rutherford Co., 2725 Prospect Ave., Cleveland, for a two-story 40 x 320-foot plant addition, to cost about \$200,000.

## RHODE ISLAND

CRANSTON, R. I.—Universal Winding Co., 1655 Elmwood Ave., Providence, R. I., has let contract to Gilbane Building Co., 90 Calverly St., Providence, for a one-story 95 x 380-foot machine shop addition, to

cost about \$100,000.

WARWICK, R. I.—Warwick Co., Idaho Ave., has asked bids on a foundry plant, estimated to cost about \$60,000.

## TENNESSEE

LOWLAND, TENN.—American Enka Corp., manufacturer of rayon yarns, has let contract to H. K. Ferguson Co., Hanna Bldg., Cleveland, for engineering and construction of a rayon tire yarn plant, for which CPA approval has been granted. (Noted Oct. 14).

## WASHINGTON

BREMERTON, WASH.—City has engaged J. W. Carey & Associates, Seattle, to make survey for proposed \$544,800 project involving sewage treatment plants, including service for Puget Sound Navy Yard.

## CANADA

CHATHAM, Ont.—Ontario Steel Products Ltd., St. George St., plans plant addition to cost about \$35,000.

CORNWALL, Ont.—Western Condensing Co., Appleton, Wis., contemplates construction of factory here to cost about \$25,000.

HAMILTON, Ont.—Canadian Industries Ltd., Box 10, Montreal, Que., has awarded general contract to Leonard Construction Co., Chicago, for plant here to cost \$1 million.

KITCHENER, Ont.—Onward Mfg. Co., 1027 King St. East, has awarded contract to Dunker Construction Co., 251 King St. West, for plant addition to cost about \$40,000. Jenkins & Wright, 47 King St. West, are architects.

MIMICO, Ont.—Mimico Foundry Co., care A. Mason, 18 Westover Hill Road, York Township, Ont., plans foundry here at Newcastle and Buckingham Sts.

PORT HOPE, Ont.—Mathews Conveyer Co. has awarded general contract to M. Sullivan & Son, Amprior, Ont., for plant addition to cost about \$25,000. Margison & Babcock, 137 Wellington St. West, Toronto, are engineers.

TORONTO, Ont.—Allanson Armature Mfg. Co. Ltd., 21 McCaul St., is considering plans for plant addition estimated to cost about \$40,000.

ARVIDA, Que.—Aluminium Specialties Mfg Co. has awarded contract to Ovila Gauthier, 46 Bosse St., Chicoutimi, Que., for plant here to cost about \$100,000.

ARVIDA, Que.—Aluminum Co. of Canada Ltd., 1700 Sun Life Bldg., Montreal, has awarded contract to Fraser-Brace Engineering Co. Ltd., 360 St. James St. West, Montreal, for converting building here into magnesium workshop at estimated cost of \$50,000.

LACHINE, Que.—Dominion Bridge Co. has awarded contract to Harold S. Kerr Ltd., 1410 Guy St., Montreal, Que., for addition to machine shop estimated to cost \$65,000.

MONTREAL, Que.—Diamond T Motor Truck Montreal Ltd., 87 Prince St., has awarded contract to Iodon Corneil Inc., 4654 St. Catharine St. West, for plant on Smith St. to cost about \$130,000. Thomas W. Burge, 4059 Beaconsfield St., is architect.

MONTREAL, Que.—Dominion Lock Co., Ltd., 7301 Decarie Blvd., is having plans prepared by H. J. Doran, Room 1010 Dominion Square Bldg., for addition to plant to cost about \$35,000.

MONTREAL, Que.—Ideal Woodwork Mfg. Co., 404 Lemoyne St., plans factory here to cost about \$50,000.

MONTREAL, Que.—John Krajicek, 8411 St. Gerard St., is considering plans for wire goods plant on St. Hubert St., estimated cost \$40,000.

ST. JOHNS, Que.—Stoker Ltd., 4 Belvidere St. South, Sherbrooke, Que., has had plans prepared by Wilfrid Gregoire, architect, for plant here to cost about \$30,000.

WINNIPEG, Man.—Ideal Brass & Plating Co. Ltd., 587 Clifton St., has awarded contract to H. E. Gibson & Co., 631 Strathcona Street, for plant here, estimated to cost about \$50,000.



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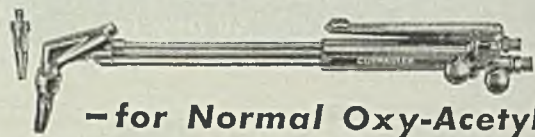
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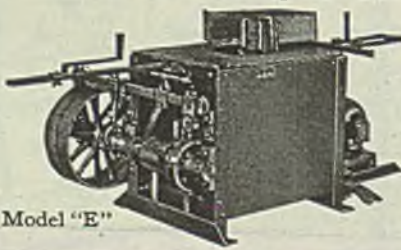
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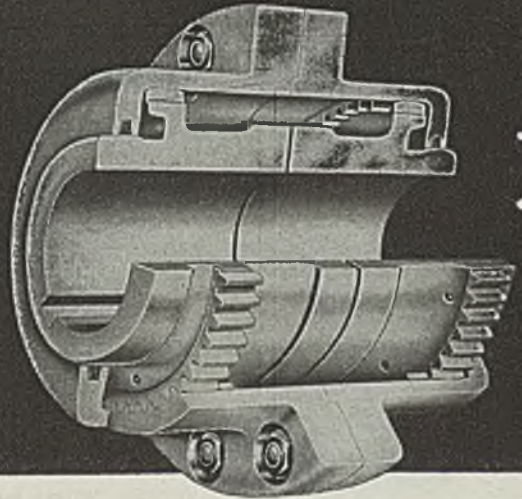
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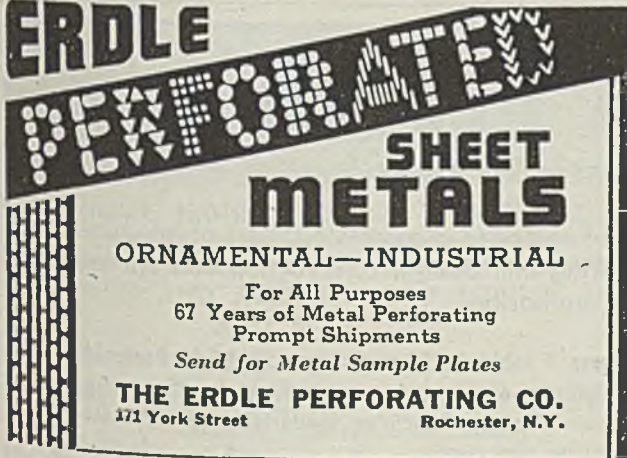
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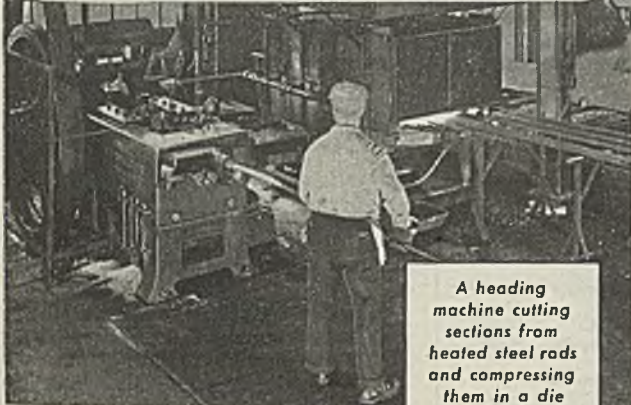
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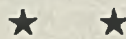
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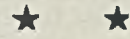
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55,000 ft.	3/4"	12 Ga.	15' Random	C.D. Seamless	SAE 1035
10,000 ft.	1 1/2"	9 Ga.	11' Random	Stainless	Type 304
1,000 ft.	2 1/4"	3/4"	11' Random	Stainless	Type 430
1,800 ft.	4 1/2"	9/16"	20' Random	H.R. Seamless	SAE 1020
20,000 ft.	4 1/2"	16 Ga.	18'2" long	Welded	SAE 1010
15,000 ft.	5"	14 Ga.	20'0" long	Welded	SAE 1010
1,500 ft.	8"	1/2"	13' Random	C.D. Seamless	SAE 1030
1,500 ft.	6 3/4"	12 Ga.	13' Random	C.D. Seamless	SAE 1030
20,000 ft.	2 1/2"	14 Ga.	15' Random	C.D. Seamless	SAE 1015
15,000 ft.	3 1/2"	11 Ga.	20' Random	C.D. Seamless	SAE 1075
2,000 ft.	3 3/4"	1/2"	15' Random	H.R. Seamless	SAE 1015
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# HELPFUL LITERATURE

## 1. Precision Wheel Dresser

Diamond Tool Co.—1-page illustrated data sheet contains operating instructions and prices of Booth three-angle automatic self-leveling turret diamond tool holder for precision dressing of grinding wheels.

## 2. Electric Welders

Federal Machine & Welder Co.—16-page illustrated bulletin No. 4520 is descriptive of type P automatic spot and projection welders which are available with transformer ratings of up to 150 kilovolt-amperes. Head, platen and electrode combinations are shown. Specifications and speed charts are included.

## 3. Motor Drives

Falk Corp.—64-page illustrated bulletin No. 3100 presents design and application data on Motoreducer standard drives for wide range of requirements. Both horizontal and vertical models are available in ranges from 1 to 75 horsepower and speeds from 7.5 to 1430 revolutions per minute. Complete information to aid in selection of proper drive for given applications is tabulated.

## 4. Gas-Diesel Engine

Cooper-Bessemer Corp.—4-page illustrated bulletin No. L-51 lists specifications and explains features of type LS gas-diesel engines which are available in vertical four cycle; 6, 7 and 8-cylinder stationary units. Bore is 15½ inches and stroke is 22 inches.

## 5. Machining Stainless Steel

Carysater Steel Co.—116-page illustrated manual entitled "Notebook on Machining Stainless Steel" provides guidance for such operations as turning, drilling, tapping, threading, milling, reaming, broaching, filing and sawing stainless steel. Tables give recommended speeds and feeds for different types. It is available to executives free.

## 6. High Speed Steel

Cleveland Twist Drill Co.—60-page illustrated handbook, sixth edition, "The Molybdenum-Tungsten High Speed Steels Marketed under the General Trade Name Mo-Max" gives composition, applications, heat treatment, properties and other data on this material.

## 7. Grinding Wheels

Blanchard Machine Co.—18-page illustrated booklet on wheels for Blanchard surface grinding machines discusses cylinder, sectored and segment types made of various materials. Details are given for selection of proper wheel for specific application.

## 8. Cold Finished Shafting

Bliss & Laughlin, Inc.—12-page supplement manual, section III, contains technical data on grades of cold finished commercial, semheavy duty and heavy duty shafting. Various types of cold finishing can be supplied to meet requirements.

## 9. Tap Flute Grinder

Edward Blake Co.—8-page illustrated bulletin No. 488 discusses details of tap flute grinding machine for accurate rapid grinding of both spiral points and straight flutes of taps and other straight and angular fluted tools such as countersinks, drills, etc.

## 10. Reinforcing Bar

Inland Steel Co.—8-page illustrated bulletin "Engineering Tests Prove Bonding Strength of Hi-Bond Reinforcing Bar" explains advantages of this material with ribs so designed that their spacing and height produce properly balanced shearing and bearing stress distribution. Results of performance tests are tabulated.

## 11. Steam Hammers

Eric Foundry Co.—12-page illustrated bulletin No. 345 traces development and gives complete data on line of double frame steam hammers. These hammers which also operate on compressed air are available weighing up to 12 tons and with strokes of up to 72 inches.

## 12. Balancing Machines

Bear Mfg. Co., Industrial Div.—16-page illustrated catalog "Bear Dynamic Balancing Machines" presents information on line of static and Dy-Namic balancing machines available in many models and types capable of balancing rotating bodies to meet any standard requirements.

## 13. Tubing

Babcock & Wilcox Tube Co.—4-page illustrated technical data card 123A lists applications of seamless and welded tubing. Seamless type is available in range of carbon steels and alloys in sizes up to 8½-inch outside diameter and welded carbon steel tubing is produced in sizes to 5-inch outside diameter.

## 14. Alloys & Specialties

Ampco Metal, Inc.—4-page illustrated bulletin No. 72 discusses aluminum bronze and copper base alloys offered by company as well as specialties such as resistance welding electrodes, mill products, continuous cast bearing bronzes, Ampco clad metals, pumps and fabricated assemblies.

## 15. Oxyacetylene Cutting

Air Reduction Sales Co.—Illustrated leaflet describes Nos. 4 and 5 Camographs for speedy, accurate machine gas cutting of straight lines and irregular shapes from templates. Specifications, electrical requirements and operating instructions are covered.

## 16. Pyrometers

Bristol Co.—20-page illustrated bulletin No. P1200 explains operation and uses of Pyromaster potentiometer type pyrometers for temperatures up to 3600 F. Automatic control, recorder and indicator types are described.

## 17. Flash Butt & Arc Welding

American Welding & Mfg. Co.—16-page illustrated booklet "American Welding" shows welding, heat treating, fabricating and research activities of company and also many product examples of application of controlled technique welding.

## 18. Hydraulic Power Units

Hydraulic Machinery, Inc.—12-page illustrated circular deals with Hy-Mac hydraulic power units applicable for new machines or change-over of existing equipment. They are adaptable to feed and traverse of multiple or single tools, indexing and locating, clamping and other movements.

## 19. Rolled Steel Floor Plate

Alan Wood Steel Co.—16-page illustrated booklet "A. W.' Rolled Steel Floor Plate" presents details of Super-Diamond, Diamondette, sunken diamond and ribbed pattern rolled steel floor plate designed to provide maximum skid resistance. Standard classification of extras is included.

## 20. Tiering Truck

Automatic Transportation Co.—8-page illustrated pamphlet "The Transtacker" shows operation and construction of electrically powered high-lift unit designed to tier, detier and transport unit loads on all types of pallets and skids. It is available in one platform and three fork models.

## 21. Straddle Trucks

Hyster Co.—8-page illustrated folder describes advantages obtainable through using Hyster straddle trucks in handling up to 9-inch steel plates. Having capacity of up to 30,000 pounds, trucks are suitable also for handling piling, pipe, bars, trusses and shapes.

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## 22. Stainless Welding Electrodes

Alloy Rods Co.—Folder No. A6-46 lists available grades of Arcaloy stainless steel electrodes. Chart shows typical weld deposit analysis and recommended current ranges for welding.

## 23. Air-Hydraulic Presses

Air-Hydraulics, Inc.—8-page illustrated bulletin describes presses having ram pressure controlled up to 5000 pounds, stroke adjustable from  $\frac{1}{8}$  to 5 inches and adjustable ram speed. They are suited for riveting, forming, light broaching, crimping, stripping, heat sealing and assembly operations.

## 24. Industrial Balancing

Bear Mfg. Co.—16-page illustrated booklet No. BIB-1 is entitled "Static and Dy-Namic Balancing by Bear." Benefits to be gained by properly balanced rotating equipment are discussed. Balancing of armatures, blower wheels, propeller fans and heat treating fans are covered specifically.

## 25. Furnace Atmosphere Unit

Hevi Duty Electric Co.—28-page illustrated bulletin No. HD 646 is descriptive of carburizer-nitridizer which provides circulation of furnace atmospheres at temperatures of up to 1850 F. Design, construction, operation and applications of this equipment are covered.

## 26. Stock Storage

Abell-Howe Co.—4-page illustrated bulletin "Improve Your Material Handling Facilities" explains use of Abell-Howe Econo-Racks for storage of large quantities of materials in small floor spaces. Racks are made in variety of sizes, lengths and heights to fit specific conditions. Liner pans can be supplied.

## 27. Longitudinal Ball Bearings

Thomson Industries, Inc.—16-page illustrated booklet "Ball Bushings" presents data on Ball Bushings unlimited travel ball bearing for linear motions. Unit is almost frictionless, has long life and sealed-in lubrication and, with its unit type construction can be installed easily.

## 28. Stainless Steel Data

Rustless Iron & Steel Div., American Rolling Mill Co.—22 $\frac{1}{4}$  x 33 $\frac{1}{4}$ -inch illustrated wall chart on "Stainless Steel Machining" lists operations or equipment used and gives corresponding recommended cutting rates for various stainless steels. Cutting tool data, machinability rates and other information are presented. Cutting rates are given in surface feet per minute and revolutions per minute.

## 29. Compressors & Pumps

Allis-Chalmers Mfg. Co.—16-page illustrated booklet on turbo-blowers, rotary compressors and vacuum pumps tells what these units are, how they operate and how to select them. Curves depicting pressure volume, influence of water vapor on volume and correction curves for volumes to maintain constant air weight with changes in temperature and barometric pressure are reproduced.

## 30. Drying Ovens

Industrial Oven Engineering Co.—8-page reprint of technical article is entitled "High-Speed Handling and Drying in the Cementing of Tire Fabric". Procedures and equipment employed in this processing operation are described.

## 31. Railroad Maintenance

Air Reduction Sales Co.—28-page illustrated booklet "Efficient Maintenance-of-Way Operations with the Oxyacetylene Flame and Arc Welding" discusses latest methods recommended for railroads. Savings in time, money and material, made possible by techniques developed are explained. Preventive maintenance in avoiding rail end batter by heat treating is covered.

## 32. Portable Grinders

Cleveland Pneumatic Tool Co.—14-page illustrated bulletin No. 80A is descriptive of Cleco portable pneumatic grinders for wide range of finishing operations. Grinder is powered by rotary motor which features four-blade rotor concentric with arbor and renewable cylinder.

## 33. Movable Steel Partitions

E. F. Hauserman Co.—32-page illustrated catalog No. 46 gives complete data on line of movable steel partitions and wall linings for adapting floor areas to exact requirements of changing functions and personnel in offices, factories and commercial establishments.

## 34. Laminated Materials

Haskelite Mfg. Corp.—8-page illustrated bulletin entitled "Haskelite" describes various forms of this material which combines wood, metal and plastics for wide range of uses. Plymetl consists of light gage metals bonded permanently to plywood core. Data are given on hardwood veneer plywood and other laminated materials.

## 35. Arc Welding

General Electric Co.—8-page illustrated bulletin No. GEA-3329 is entitled "How to Repair Tractor Parts by Arc Welding". Possible savings, welding procedures and typical operations are covered.

## 36. Surface Treating Materials

American Chemical Paint Co.—Three illustrated bulletins Nos. P-100-21, 7-16-100 and 7-6-30 describe rust proofing chemicals, protective coatings, metal cleaning chemicals and inhibitors; Alodine rustproofing process for aluminum and its alloys; and cold spray Granodine phosphate coating process for painted steel.

## 37. Blind Fastenings

B. F. Goodrich Co.—36-page illustrated "Rivnut Data Book" explains design and applications of this blind rivet which also can serve as nut plate. Sizes, head styles and grip ranges are listed. Complete specifications of all types are given.

## 38. Automatic Screw Machine

Greenlee Bros. & Co.—16-page illustrated bulletin on the Greenlee automatic screw machine gives complete data on this machine which is designed for short and long run jobs. It is engineered for quick set-ups and ease of operation. Four and six-spindle automatics are covered.

## 39. Heavy Equipment

Fluor Corp.—20-page illustrated bulletin No. 46 presents data on aerator cooling tower, construction service, gas cleaners, mufflers, piping service, process equipment, pulsation dampeners and other equipment for oil, gas and allied industries.

## 40. Flexible Couplings

Ajax Flexible Coupling Co.—24-page illustrated catalog No. 44 presents complete data on Ajax line of flexible couplings. Details are given on available types and their application. Horsepower ratings, service factors and dimensions are included to aid in selection and application. Couplings protect direct connected machines from unavoidable misalignment. They can be installed in any position.

## 41. Lead Checker

Fellows Gear Shaper Co.—12-page illustrated bulletin on No. 12H lead measuring instrument explains applications of this device for checking accuracy of helical and other surfaces. Operation of instrument is explained.

## 42. Throatless Shear

Beverly Shear Co.—Illustrated leaflet describes B-3 heavy duty bench type throatless shear adaptable for cutting intricate shapes. It incorporates ball bearing metal holding device which guards against distortion, scratching or marring of metal.

## 43. Altitude Chambers

Bowser, Inc., Refrigeration Div.—4-page illustrated bulletin on Bowser Altitude units describes two models of testing chambers which are designed to simulate conditions of pressure, temperature and humidity encountered at altitudes of up to 75,000 feet.

## 44. Belting

B. F. Goodrich Co.—6-page illustrated folder on power transmission belting describes flat and V-belting for various services, as well as sheave, belt dressings and Plylock method of making flat transmission belts endless on the job.

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