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STEEL

The Magazine of Metalworking and Metalproducing

VOL. 118, NO. 24

JUNE 17, 1946

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"WE'RE SWELL
FELLOWS,
BUT..."

"IF WE COULD ONLY
GET PRICE RELIEF..."

"LOOK WHAT WE'RE
WORKING ON FOR
TOMORROW"



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Whole or Half Loaf?

As the EDITOR

VIEWS

the NEWS

Traveling by motor car over the poor roads of eastern Asia at slow speed gives one a good opportunity to view rural and village life at close range. On these roads are refugees pushing all of their worldly belongings on flimsy carts or wheelbarrows. Alongside in the fields farmers are plowing with plows of sharpened wood drawn by patient beasts. Seldom does one see a steel plow or any mechanical device to lighten the burden of hard labor.

As one takes to the air and flies over thousands of square miles of territory similar to that he has observed from the ground, he realizes that the primitive conditions he has witnessed exist in extensive areas throughout the Far East. Hundreds of millions of people in these vast regions endure a standard of living that has improved only slightly in scores of centuries.

One cannot help but wonder why there has not been more improvement. Pioneers in the United States less than three centuries ago started with implements as crude as those employed in Asia, yet the standard of living has risen to a high plane. Why has progress in much of Asia been so slow in comparison?

The reason cannot be entirely economic, because in the regions where the mode of life is most primitive there are rich natural resources which, if developed, could support a high standard of living. If the reason is not economic, it must be political. Can it be that the people here have suffered so long and continuously from the effects of feudalism, exploitation, oppression and heavy taxation that they have long since given up hope of individual freedom and opportunity to improve their station?

How to encourage these millions to achieve a better standard of living now is a problem affecting the entire world. Henry Wallace's suggestion of a bottle of milk per person per day is not the answer—literally or figuratively. The real solution lies somewhere in the realm of a form of government that will afford these people an opportunity to help themselves—a condition where it will be worth their while to work for, obtain and keep a better plow or a more comfortable home.

The incentive to do this should be provided soon. If it is not, these people may be tempted to accept the half-loaf of fancied security offered by the propagandist of collectivism instead of waiting for the whole loaf of individual freedom under a democracy.

STEEL

June 17, 1946

CASE BILL VETO: Government labor policy continues a mess. President Truman's veto of the Case bill would seem to definitely rule out the possibility of early adoption of any constructive labor relations legislation. For all practical purposes the high-pressure labor bosses can continue to pursue their rule or ruin policies without hindrance.

In upholding the veto the House placed itself in the same embarrassing position as the President now finds himself. Should provisions of the Case bill be tacked onto the President's proposed emergency

labor legislation, as suggested in some quarters, the President, to be consistent, would have no alternative but to veto this measure also. Is it logical to expect Congress to react differently to a second veto?

To what extent political expediency entered into the President's position on the Case bill is a matter upon which we can only speculate. Suffice it to say, however, his attitude seems wholly inconsistent with that he took less than a month ago when he asked for temporary legislative curbs on organized labor far more drastic than were embodied in the Case bill.

(OVER)

Long-term, not temporary, legislation is required to correct the abuse of power so ruthlessly exercised with immunity by the walking delegates and labor skates. The Case bill, imperfect though it may have been, was the only piece of constructive labor legislation to get past both houses of Congress in a decade. It would have provided a good start towards erection of long-term labor law which would restore balance in labor matters so sorely needed in the interests of all of the people. Now we must start all over again. —p. 82

RAPID RECOVERY: Steelmaking operations are recovering rapidly from the effects of the bituminous coal mine strike. Last week the national ingot rate was estimated at 75 per cent of capacity, increase of 20 points from the rate in effect the preceding week when coal mining was resumed.

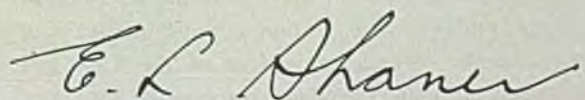
Post-coal strike upturn in steel, however, while gratifying, is proving slower than was recovery following the steel strike. In the first two weeks after the steel walkout, ingot operations rose about 51 points. This compares with the current recovery in like period of only 32 points. The periods, however, are not wholly comparable since ingot operations during the steel strike dropped to a low point of 5.5 per cent whereas the low point during the coal stoppage was 43 per cent of capacity.

Continuance of the current rate of recovery could push ingot operations back to the pre-strike level, just under 90 per cent of capacity, within three weeks of the ending of the mine stoppage, a feat which most observers had predicted would take from a month to six weeks to achieve. There is no assurance this will be experienced, however. In fact, current serious raw material shortages, such as in scrap, if not substantially relieved without delay can easily reverse the trend line. —p. 77

FORGING TRIUMPH: Setting up a forge shop around a gigantic 18,000-ton hydraulic press, with which billet-heating and heat-treating furnaces are integrated and the whole served by elaborate materials handling facilities, an eastern company is preparing to make die forgings of aluminum and magnesium alloys in sizes heretofore outside the scope of available equipment.

Creation of this unit is a double triumph of press and production engineering, and is otherwise significant in that it will permit utilization of the newest high-strength light alloys and successful competition with European capacity of similar size. Indicated applications are aircraft engine parts, propeller blades, structural members of I-beam section, large disk-like forgings of considerable projected area, and other aircraft and automotive parts for which light metals are specified. —p. 114

SIGNS OF THE TIMES: Sheet steel consumers who have been having difficulty obtaining enough sheets to sustain manufacturing operations, are finding cause for hope supply pinch will not be long in easing in the fact sheetmakers are installing additional facilities (p.80) which will add some 1,118,000 tons of rolling capacity this year. . . . To what extent steel supply will fall short of meeting actual demand this year is anyone's guess. Which of course adds to the uncertainty in the market with recurring talk of reinstating government steel priorities (p.86). . . . Federal Trade Commission has asked the Third Circuit Court of Appeals (p. 84) to deny petition of U. S. Steel Corp. for clarification of FTC cease and desist order in the Pittsburgh plus steel pricing case. FTC claims modification of the order would conflict with the law. . . . Nearly four months have elapsed since issuance of the latest government stabilization order, but many employers do not yet understand the yardsticks used in deciding when prices may be advanced on the basis of wage increases (p.90). . . . Cenco photometer (p.110) is being used with increasing success in metallurgical laboratories to determine rapidly and accurately analysis of molybdenum and other elements commonly found in steel. Unique property of the instrument is its light source is not varied, nor does it indicate the transmission value of a solution for the total spectral band of light source. . . . New orders for industrial furnaces and ovens are reported declining (p.96) but backlogs are increasing as buying exceeds production which is hampered by inadequate supplies of raw materials. . . . Key to most of southern California's industrial problems (p.99) is the area's rapidly swelling population, survey shows. With in-migrants forming an unremitting flood across the state line, area facilities of all kinds are being strained to limits above normal capacities in every community. . . . Conversion of the war-born Big Inch and Little Inch pipelines to natural gas transport is a possibility for the future. Government bids for purchase or lease of these facilities will be taken soon (p.89) and while preference will be given prospective purchasers planning to utilize the lines for petroleum transport, offers calling for conversion to natural gas will be entertained—a change of policy from some time ago. . . . Labor's productivity increased in 1945 (p.91), states the Bureau of Labor Statistics. In 25 of 29 industries, it reports, man-hour output showed at least moderate increases over 1944.



EDITOR-IN-CHIEF

STEEL

all agree . . .



**PLANT
MANAGER**



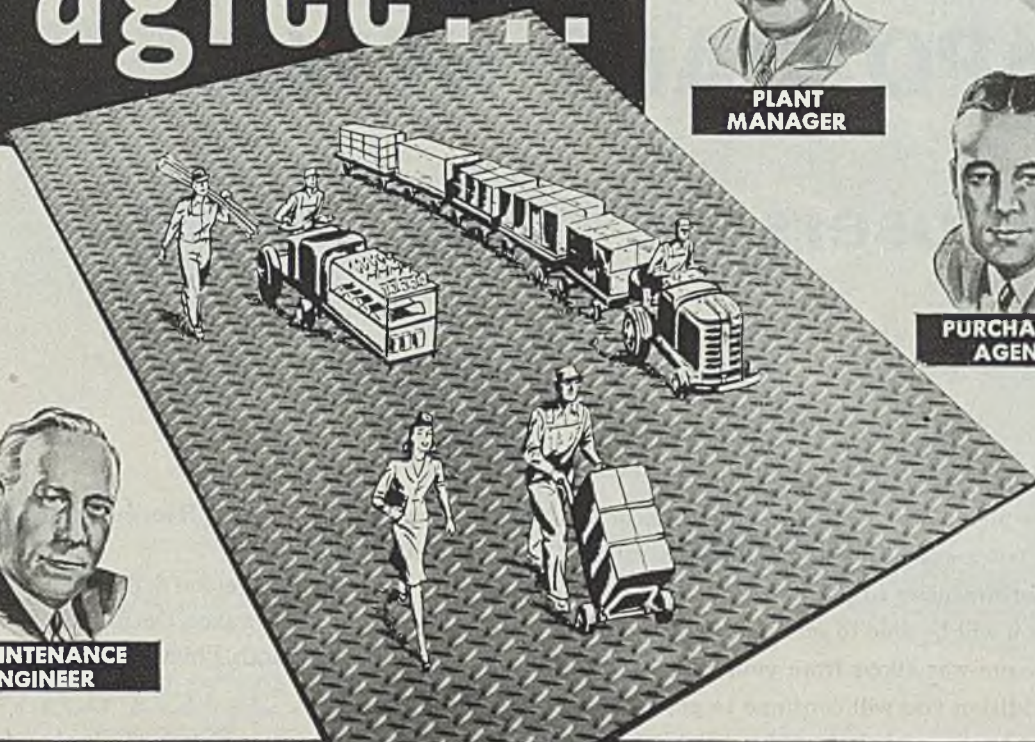
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IMPORTANT NEWS

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RYERSON STEEL

June 17, 1946



Ships damaged in the war or declared overage or surplus are providing some scrap for steel mills. Above are shown parts of a wrecked aircraft carrier in the Bethlehem, Pa., yard of Bethlehem Steel Co.

Scrap Shortage Chief Obstacle to Steel's Recovery

Request for higher price ceilings refused by OPA. Mills have less than half normal inventories. Resumption of adequate flow must await higher operations in metalworking plants. Ingot production recovers 20 points to 75 per cent

SHORTAGE of iron and steel scrap now constitutes the greatest obstacle to the steel industry's attempt to regain high production levels. Mills generally have only three to four weeks' supply, or about half their normal working inventory. In some cases, mills actually are losing production because of the scrap shortage.

Despite the scrap shortage and other difficulties, the industry is making a faster than anticipated recovery following the coal strike. Ingot operation last week climbed 20 points to 75 per cent of capacity. This compares with a rate of 89½ per cent just before the coal strike started.

Steel supply situation continues the tightest in history, with no relief in immediate prospect. The unbalance in steel supply and demand last week caused the Civilian Production Administration to restore preference ratings for steel for housing and farm machinery (see page 79).

The Office of Price Administration has refused a request by the scrap in-

dustry to increase ceiling prices by \$2.50 a ton. This action is expected to release scrap which was being held in anticipation of a price increase, inspired by recent adjustments in lead, brass and copper scrap.

Scrap dealers argued higher prices were required to offset increases in labor, equipment and supply costs and to permit collectors to pay more at the source. OPA denied the request on the ground that no financial hardship exists in the industry. The requested increase, OPA estimated, would have cost the steel industry \$60 million annually.

Hint Production Loss

Commenting on OPA's denial of price relief to the scrap industry, the Institute of Scrap Iron & Steel Inc., Washington, said it is using its offices to request that dealers everywhere continue to buy, prepare and ship as much scrap as possible under existing OPA regulations and price levels. However, it warned that in view of OPA action, "the scrap industry

cannot assume responsibility for any loss of production at steel mills and foundries that might occur due to lack of scrap."

The scarcity in scrap is due largely to the fact that industries which usually generate scrap have been operating at low levels, if at all, due to strikes in their own or suppliers' plants, to the fact that mills used larger than usual amounts of scrap during the coal strike when blast furnaces were banked and hot metal was unobtainable, and to the fact that large quantities of scrap were used in war materials and dissipated abroad.

Scrap and steel mill interests are pessimistic over any early improvement in the scrap supply situation. Consensus is that a normal flow must await attainment of nearly normal operations in metalworking plants which produce scrap. Collection campaigns, such as engineered during the war, they believe, would produce only limited supplies, and those of doubtful quality.

Robert W. Wolcott, president of Lukens Steel Co., Coatesville, Pa., and chairman of the American Iron & Steel Institute committee on scrap, estimates current supplies are little better than in 1942 when some open hearths were forced to suspend because of the shortage. Mr. Wolcott appealed for co-operation by all

interested parties in assisting the flow of scrap to the steel mills.

The situation in leading industrial districts as appraised by STEEL's editors: **NEW YORK** — Stringency in scrap of all grades is likely to remain for some weeks. Some improvement in volume of manufactured scrap has developed, but it is slight and trade leaders expect no marked gain soon.

With the OPA Scrap Advisory Committee having rejected appeals for higher prices, trading here is again stepping up following almost total inactivity pending decision in the matter. Sentiment on the action of the committee is mixed, with dealers still being confident that an increase would have brought out steel scrap long dormant, particularly stripped material at auto graveyards.

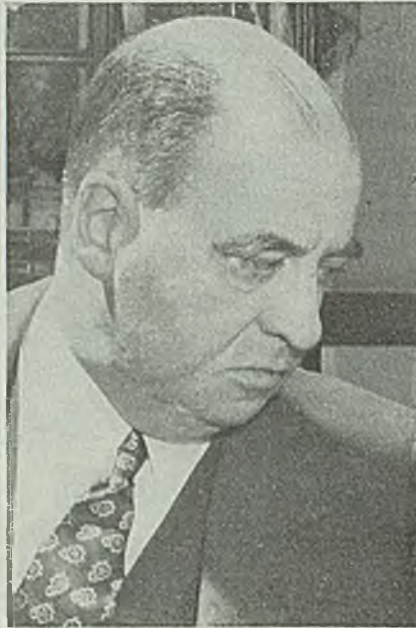
Cast grades are the scarcest in years. No important demolition operations are under way, as there is still an effort to keep equipment going and in use until replacements can be made. These replacements still appear to be some distance off.

Heavy melting steel is being absorbed as quickly as it is prepared, as the steel mills, especially in view of the shortage of pig iron, are bending every effort to obtain scrap for current operations and, if possible, to accumulate a little backlog. Some consumers have less than two weeks' supply on hand; a number have far less than a month's supply.

DETROIT — Strong demand for all grades of iron and steel scrap continues to meet low supply and there appears to be no corrective until the flow of production scrap accelerates from the present restricted rate. Dealers and brokers believe proposed collective drives, such as engineered during wartime, will be productive of little material, and that of low grade. Until the normal pattern of scrap movement from fabricator back to melter can be re-established, there is little that can be done to satisfy bulging demands of scrap users. One interest estimates it will take six months minimum to achieve this. Ordinarily an increase in price will drive out more scrap, but there is no sentiment in this area for removal of price ceilings. Some readjustment of inequitable preparation charges is believed desirable, but a price increase is considered as only inflationary.

Foundries are in particularly bad shape as far as scrap is concerned, there being virtually no cast material available, forcing operators to rely on pig iron and home or return scrap.

Inland Steel Co. is loading a boat here with 3000-5000 tons of scrap for shipment back to its mills. The vessel



ROBERT W. WOLCOTT

brought a cargo of sheet and strip for local fabricators, most of whom are channeling their scrap back to the mill source. These are not so-called "direct" deals, but follow conventional scrap trade channels.

Yard operations are about 50 per cent of normal, mainly because of inability to obtain accustomed productivity from working forces.

PITTSBURGH — Flow of iron and steel scrap into consuming channels has failed to keep pace with rapid upturn in primary steel production, and no early improvement is in prospect. Little hope is held for a major increase in scrap government until metalworking companies build up balanced steel stocks and resume normal operations. Trade authorities estimate 30 to 60 days will elapse before industrial scrap moves freely. Meanwhile mills will use a greater proportion of hot metal in their open-hearth operations.

Steel mills' scrap inventories average less than three weeks' requirements at near capacity rate of operations. During the steel strike most steel producers were unable to accumulate much scrap for many metalworking companies also were closed or had to curtail production schedules sharply. Throughout the coal strike there was a heavy drain on scrap inventories due to greater use of scrap to offset pig iron shortage.

Some independent steel companies were able to sustain operations at a higher rate than the larger interests during the coal strike and their scrap stocks are more depleted. Integrated mills report an unbalanced scrap stock position at key producing centers and

are finding it necessary to make inter-plant shipments to ease situation at those plants that are critically short. Such a shipment of about 3000 tons recently was made from Pittsburgh into the Chicago district.

More frequent reports of up-grading indicate growing tightness in current scrap supplies. One abuse in this connection reported recently was an effort to pass off No. 2 bundles and electric furnace bundles to mills as low-phos plate scrap.

CHICAGO — Demand for steelmaking scrap continues tremendous and only a part can be satisfied in view of the growing shortage. During the coal strike when many blast furnaces were banked, scrap was relied upon to keep steel output at the highest possible level. Result is that inventories are low and cannot be built up under present conditions. Steel output is rising rapidly but from here on its expansion may be influenced by scrap supply. One producer already is holding three open hearths out for lack of melting material; others report receipts reasonably match consumption. Foundries also are short of scrap. Prices on all principal grades hold firmly at ceiling.

CLEVELAND — Scrap shortage has reached the critical stage and may check rise in steelmaking and force reduction in foundry operations soon. Steel mills have a maximum of four weeks' supply, lowest level since 1942 when a similarly severe shortage forced the closing of some open hearths.

Foundry situation is mixed. Some which were closed or were operating at a reduced rate recently due to shortages of fuel and pig iron have been able to replenish supplies and their operations are not endangered. Others are operating on a hand-to-mouth basis and may have to close within the next two weeks unless larger shipments of scrap are received.

Some foundries are sending out their own trucks to pick up small lots of scrap at machine shops and other non-dealer sources. Scrap is being brought in from afar to augment nearby supplies. One shipment came from Seattle. Scrap buyers believe some scrap is being withheld from the market in the belief higher prices will be authorized.

DALLAS, TEX. — Scrap supply in Texas is tight, with receipts at consuming centers deteriorating steadily and approaching a critical inventory stage. Sheffield steel plant at Houston, which uses 1000 tons a day, has only a 9000 or 10,000-ton supply—or enough for 10 days. Receipts have dropped from 16 cars daily

(Please turn to Page 177)

CPA Preference System Set Up on Housing and Farm Machinery Steel

CIVILIAN Production Administration last week established an emergency distribution system providing preferences for steel entering housing and farm machinery products following a warning by Administrator John D. Small that "Steel will be critically short for all purposes during the next 60 to 90 days."

Emergency distribution will cover most urgent steel requirements, and the list will not be expanded, Mr. Small said. The new restrictions will not apply to wrought iron, iron castings or pig iron. Distribution of iron to critical products will be covered by other procedure to be announced shortly.

The new distribution plan, set up under direction 12 to steel conservation order M-21, applies only to steel in forms and shapes in schedule 1 of order M-21. Under the plan, which is called self-certifying, manufacturers of critical farm machinery and steel housing products merely certify by letter to the steel mills that certain steel which they have previously ordered will be used in the manufacture of these critical items.

The certified orders must be scheduled for production and delivery by the mills in preference to all unrated orders even though they may be for the same steel product classification. For instance a certified order for steel sheets would take precedence on a mill schedule over uncertified orders. However, written CPA directives or, in the case of steel distributors, AAA ratings issued after Jan. 21, 1946, still have precedence over these classifications.

Mills are required to ship to warehouses during the third quarter not less than the same proportion of total tonnage of steel produced by them in that quarter as they shipped during the fourth quarter of 1945.

Certified orders can be placed on July schedules only when they have been received on or before June 17 and on which at any time since Jan. 1 this year, the producer promised delivery before Sept. 30. Certified requests for August delivery must be received by the mill by July 1 and for September delivery by Aug. 1.

In addition steel may be certified for manufactures of railroad brake shoes, also concrete reinforcing rod and mesh for dwelling units only.

Any manufacturer of one of the critical products who on June 17 did not have purchase orders placed with a steel mill whether certified or uncertified for

steel for such products may place a certified order on a warehouse without CPA authorization. However specific CPA authorization is required for permission to certify orders for steel to be used in a plant not in production because of a work stoppage. Also no certification can be made on a warehouse by a manufacturer whose plant is out of production because of work stoppages.

Amount of steel which may be certified in any one month of the third quarter is limited to 40 per cent of the amount to be put into production in the third quarter. None of the certified steel may be used to build up inventories.

A warehouse need not accept any certified order for a single product classification of steel in excess of 10,000 pounds if delivery would seriously deplete the stock of that particular warehouse.

Steel producers may refuse certification in some cases. A producer need not accept a certification on an already accepted purchase order, if the certification is received after the first day of the month preceding delivery month, and on orders for July, he need not accept certification if received after June 17.

CPA also announced that direction 12 to Priorities Regulation 1 which suspended preference ratings except certain AAA ratings, remains in effect on steel for the time being. Direction 9 to Order M-21 which provides certifications for tin mill products for food and pharmaceutical purposes also remains in effect.

Present, Past and Pending

■ REPUBLIC'S LEASE ON SOUTH CHICAGO PLANT EXTENDED

CHICAGO—Republic Steel Corp.'s lease on the government-owned South Chicago steel plant has been extended indefinitely on a month-to-month basis at a monthly rental of \$55,000.

■ CPA TO ISSUE DIRECTIVES FOR 110,000 STEEL DRUMS

WASHINGTON—Civilian Production Administration has directed manufacturers to make and ship 110,000 steel drums during June and July for shipping corn syrup to Europe. Manufacturers of 16 and 17 gage steel drums will be given preference for materials over all others except AAA-rated orders. CPA directives will name customers.

■ SECOND PRICE ADVANCE GRANTED ON ARMORED CABLE

WASHINGTON—Armored cable makers are granted a second interim price increase averaging 11.3 per cent over previous maximum prices. This was in recognition of the industry's hardship position resulting from higher wire, copper and lead prices.

■ SUBSIDY PAYMENTS CUT ON COPPER AND LEAD

WASHINGTON—Procedure has been established by the Office of Economic Stabilization for reducing subsidy payments on copper and lead by the amount of June 3 price increases of 2.37½¢ a pound on copper and 1.75¢ a pound on lead. Total basic return for subsidy-receiving mines continues at 17¢ for copper and 9.25¢ for lead.

■ PACKARD PROTESTS DIVERSION OF PIG IRON

DETROIT—Packard Motor Car Co. has protested to Michigan congressmen diversion of pig iron to manufacturers of soil pipe under directive of the Federal Housing Authority. Packard is now receiving only 50 tons a week, sufficient for operations at only 6 per cent of capacity. Other automotive foundries are faced with similar predicaments.

■ SHEET AND TIN MILL FOREMEN REJECT UNION

GARY, IND.—Supervisory personnel at the sheet and tin works of Carnegie-Illinois Steel Corp. here rejected the Foreman's Association of America as their bargaining agent in an election June 6.

■ \$80 MILLION BUDD CO. RESULTS FROM MERGER

PHILADELPHIA—An \$80 million corporation, the Budd Co., results from merger of the Edward G. Budd Mfg. Co. and the Budd Wheel Co., approved by stockholders of the two companies last week. Unfilled orders of the new company total about \$158 million.

■ SUBSIDY STEEL BUYING EXTENSION CONSIDERED

WASHINGTON—Extension through July of government subsidization of semifinished steel purchases by certain nonintegrated sheetmakers was considered last week by RFC and CPA officials but definite decision was reserved pending developments. At the same time it was learned proposals were made Sharon Steel Corp. to provide semifinished tonnage to the nonintegrated mills from its Lowellville, O., works, but whether by subsidy arrangement or otherwise was still to be decided.

Flat-Rolling Capacity Being Increased

Mills already installed or under construction to add 1,118,000 tons to industry's capacity for sheet, strip. Many cold-reduction units included

CAPACITY for rolling flat steel products, supply of which has been critically short since the war's end, will be increased by 1,118,000 tons this year by equipment already installed or under construction.

Carnegie-Illinois Steel Corp. contracted early this year for two new slab heating furnaces and the rebuilding of three existing furnaces for its Gary Works, Gary, Ind. A new 54-in. 4-stand cold reduction mill is being installed.

Great Lakes Steel Corp., Ecorse, Mich., also is building a new cold reduction mill with an estimated annual output of 160,000 net tons.

Jones & Laughlin Steel Corp., Aliquippa, Pa., is installing a 42-in. 5-stand 4-high mill for rolling tin mill coils. When the 42-in. unit is completed, the 54-in. mill at Pittsburgh will be relieved of tin mill specifications and will be scheduled on sheets entirely, with an added tonnage for the market of 36,000 net tons annually. Company also plans to expand cold reducing facilities at the Otis division by 160,000 net tons annually.

Bethlehem Steel Co., Sparrows Point, Md., recently completed a 56-in. 4-high tandem cold reducing mill for the production of 185,000 net tons annually.

Youngstown Sheet & Tube Co., Campbell, O., has completed a cold mill with an output of 180,000 net tons annually.

Weirton Steel Co., Weirton, W. Va., this year installed a 4-high 5-stand high-speed cold reducing mill rated at 165,000 net tons.

Facilities for increasing output of stainless steels have been purchased by two companies. McLouth Steel Corp., Detroit, has under construction two new cold reduction mills for rolling this product in a wide range of gages and types. They will afford an increase of about 150,000 net tons annually. A 4-high 4-stand continuous mill for rolling stainless and silicon strip recently was installed at the Brackenridge, Pa., plant of Allegheny Ludlum Steel Corp.

Late last week the Steel Co. of Canada placed an order with the Mesta Machine Co., Pittsburgh for a 56-in. hot strip mill for installation at its Hamilton, Ont., plant.



Acquisition of the Portsmouth steel plant of Wheeling Steel Co. by the newly formed Portsmouth Steel Corp. is expected to assure substantial steel tonnages for the new Kaiser and Frazer autos. Interested in the deal are, left to right, Henry J. Kaiser, chairman of Kaiser-Frazer Corp.; Cyrus S. Eaton, Cleveland financier and industrialist and chairman of the new steel company; and Joseph W. Frazer, president of Kaiser-Frazer Corp.

New Portsmouth Steel Co. To Supply Automobile Sheets for Kaiser-Frazer

SUBSTANTIAL portions of automobile sheet steel required by Kaiser-Frazer Corp. and Graham-Paige Motors Corp., Detroit, will be provided through acquisition of the Portsmouth, O., works of the Wheeling Steel Corp., Wheeling, W. Va., by the newly created Portsmouth Steel Corp.

The two auto companies would obtain sheet steel under a contract already arranged with the new corporation. This arrangement is seen as of material assistance to the Kaiser-Frazer Corp., which, because it started operations recently, has had difficulty procuring steel, due to the tight steel supply situation. Information as to when steel could start flowing to the two auto companies under the new contract was not available.

The Portsmouth works covers approximately 190 acres of land and includes a by-product coke plant with annual capacity of about 450,000 tons; a blast fur-

nace with a 285,000 ton capacity; 10 open hearths with a rated capacity of approximately 612,000 tons; mill equipment for producing semifinished steel; a 192,000-ton capacity rod mill; a wire mill and a number of other units including iron, steel and brass foundries. Details as to disposition of all products of the Portsmouth works under the new organization were not available.

Organizers of the new Portsmouth Steel Corp. are Cyrus S. Eaton, Cleveland industrialist and financier, and a group of associates including William R. Daley, president of Otis & Co., investment bankers, Cleveland. Mr. Eaton will be chairman of the new corporation, but other officers have not been announced.

For \$12 million the new corporation will acquire Wheeling Steel's Portsmouth works, the Emperor Coal Co. of Kentucky, the Portsmouth inventories and work in process, and working capital. Portsmouth

Steel Corp. would issue 1,025,000 shares of common stock to the public at \$10 a share. Underwriters of the new issue will be Otis & Co. An additional 300,000 shares of common stock would be issued, with Kaiser-Frazer Corp. purchasing 200,000 of these shares and Graham-Paige Motors Corp., 100,000 at the public offering price.

Sources close to the new corporation said that installation of a new steel plant with an ingot capacity comparable with the 612,000-ton annual capacity of the Portsmouth works would cost today approximately \$100 per ingot ton annual capacity, or around \$61 million.

It was pointed out that while the Portsmouth works, because of its location, may be less vital to Wheeling Steel Corp. than if the former were located near Wheeling, the Portsmouth plant is advantageously located with respect to coal, scrap, and rail and water transportation.

Operating personnel of the Portsmouth plant will remain unchanged, it is reported.

Portsmouth Steel Corp. will have a monthly steel ingot capacity of approximately 50,000 tons, and will engage in manufacture of a variety of steel products including ingots, slabs, sheet bars, tie plates and wire products.

Steel sheets for Kaiser-Frazer and Graham-Paige will be rolled for the new steel corporation by Wheeling Steel at Steubenville, O. Wheeling Steel's Steubenville works has one continuous hot strip mill with an annual rolling capacity of 768,000 tons, two continuous cold reducing strip mills with an annual rolling capacity of 360,000 tons, and five continuous cold finished sheet mills with a total annual rolling capacity of 375,000 tons.

Mr. Eaton, chairman of the board of the new steel corporation, was active in the organizing of the present Republic Steel Corp., and he is a director of the Cliffs Corp. which, with its subsidiary, the Cleveland-Cliffs Iron Co., has substantial stockholdings in Republic Steel Corp., Inland Steel Co., Youngstown Sheet & Tube Co., Jones & Laughlin Steel Corp., and Wheeling Steel Corp. Mr. Eaton also is a director of Steep Rock Iron Mines Ltd., as well as several other companies. For many years he has been associated with Otis & Co., principal underwriters for financing of Kaiser-Frazer Corp.

A. M. Byers To Enlarge Ambridge, Pa., Plant

A. M. Byers Co., Pittsburgh, is installing facilities for production of hot-rolled and cold drawn alloy steel bars and wire at its Ambridge plant. Facilities are expected to be ready for operation late this year.

Wheeling Steel To Spend \$50 Million On Long-Term Modernization, Expansion

PLANS for modernization and expansion have been announced by Wheeling Steel Corp. for its Wheeling district facilities, particularly the Mingo, O., property it acquired recently from Carnegie-Illinois Steel Corp., Pittsburgh.

The contemplated improvements that would be made over a period of years may involve expenditure of as much as \$50 million at Mingo, Steubenville, O., East Steubenville, W. Va., Yorkville, O., and the Wheeling district.

Announcement of these plans came at the same time that sale of Wheeling Steel's works at Portsmouth, O., to the newly organized Portsmouth Steel Corp., headed by Cyrus S. Eaton, Cleveland industrialist and financier, was made public.

The Mingo plant property comprises approximately 156 acres with about 5000 feet of river front with modern docks. Present equipment consists of three blast furnaces, two bessemer converters, two hot metal mixers, numerous mill buildings, cranes and auxiliary equipment adapted to iron and steel manufacture. In addition to modernizing existing facilities, Wheeling Steel plans to construct additional coke ovens, and open hearths, with necessary rolling mill equipment, and to interconnect the Mingo plant with its Steubenville and East Steubenville plants.

Upon completion of its expansion program and eliminating tonnage formerly produced at Portsmouth, Wheeling Steel expects to emerge with an annual ingot capacity in excess of two million tons.

Reduced cost of production and other economies obtained through its expansion program should materially improve Wheeling Steel's competitive position and increase its earning power, it was pointed out.

Rust Awarded Contract for Pipe Annealing Furnaces

Contract for five continuous pipe annealing furnaces for U. S. Pipe & Foundry Co. and two licensees, Pacific States Cast Iron & Pipe Co. and McWane Cast Iron Pipe Co., has been awarded to Rust Furnace Co., Pittsburgh.

Rust will construct the furnaces according to U. S. Pipe & Foundry design. Three of the furnaces will go to U. S. Pipe plants at Burlington, N. J., Bessemer, Ala., and Birmingham. One will be installed for Pacific States Cast Iron & Pipe at Provo, Utah, and one for McWane Cast Iron Pipe at Birmingham.

The furnaces each have a capacity of 20 to 25 tons per hour. Those for U. S.

Pipe & Foundry at Burlington and Bessemer have a range from 3-inch to 36-inch diameter pipe, while the remainder take a maximum 24-inch diameter pipe.

Jessop Seeks To Lease Government-Owned Works

War Assets Administration announces certain steel mill equipment facilities erected during the war at a cost of \$1,529,633 and operated by Jessop Steel Co., Washington, Pa., have been put up for sale or lease. Jessop Steel Co. officials state, however, that negotiations are under way to lease this property on a five-year term basis, with option to buy during this period. Under the surplus property law, the War Assets Administration has to advertise this property for sale or lease.

Armco To Build 25 Coke Ovens at Hamilton Plant

American Rolling Mill Co. will construct 25 coke ovens at its Hamilton, O., plant at an estimated cost of \$1,275,000. In addition, the company will spend \$300,000 repairing existing ovens.

Koppers Construction Co. has been awarded the construction contract. Work will start within a few weeks and it is anticipated the new ovens will be in operation next April.

The new units will bring the total at Armco's Hamilton plant to 110.

J & L Plans Expansion At McKeesport Works

Jones & Laughlin Steel Corp., Pittsburgh, will enlarge its manufacturing and repairing equipment at its McKeesport Works near Port Vue, Pa. Plans include construction of barge building yards on the bank of the Youghiogheny River. Upon completion of the yards, the corporation will begin replacement of its existing fleet of river barges.

Virginia Bridge To Erect New Birmingham Plant

Virginia Bridge Co. will build a new plant adjacent to its present facilities in East Birmingham, Ala., at an estimated cost of \$1 million. Capacity will be increased by one-third. Work will start as soon as materials are available and will require one year to complete.

Veto Dims Hope for Antistrike Act

Congress studies possibility of hitching Case bill to President's own emergency measure. Passage of corrective labor legislation at present session unlikely

PROSPECTS for effective antistrike legislation during the current session of Congress are considered exceedingly dim following President Truman's veto of the Case bill last week and the upholding of the veto by a narrow margin by the House.

Although the President's own emergency antistrike bill, drastically modified by removal of the vital provision for inducting strikers against the government into the armed service, still pends in Congress little enthusiasm for the bill is evident.

Following veto of the Case bill, a movement was started in Congress to attach the main provisions of this measure to the President's emergency bill and send the combined measure back to the White House. Should the maritime dispute develop into a paralyzing strike, it is possible this will be done.

However, a combination of the President's recommendations and the Case bill probably would be vetoed by the Chief Executive and leaders in Congress believe the veto would be upheld in the Senate if not in the House.

Organized Labor Opposed Bill

The Case bill was actively opposed by organized labor, although public and employer opinion supported it. Major provisions of the measure included creation of a federal mediation board, restrictions against any strike or lockout while the board was seeking solution of a labor dispute, prohibition of secondary boycotts, provision for court suits against employers or labor unions for violations of collective bargaining contracts, outlawing of welfare funds financed by employers and administered solely by union, prohibition of organizing of supervisory employees, and subjecting of unions to the antiracketeering act which prohibits interference with interstate commerce by robbery or extortion.

The House, which originally passed the bill by 230 to 106, voted 255 to 135 to override the veto, failing by 5 votes of the necessary two-thirds majority.

In his veto message, the President renewed his plea for passage of his own emergency antistrike legislation and for



Unfinished streamline passenger cars, badly needed by the country's railroads in their rehabilitation and modernization program, glut the Chicago yards of Pullman-Standard Car Mfg. Co. According to Champ Carry, president of the company, the new cars remain undelivered for lack of ball bearings, certain electrical equipment, hardware, air conditioning and an assortment of other materials held up by the cumulative effect of labor difficulties in industries supplying materials for cars. NEA photo

a long-term study of the whole field of labor relations. Observers pointed out that such a study would be unlikely to produce a sound corrective bill to labor abuses.

Cut in Coal Freight Rates To Youngstown Area Upheld

U. S. District court has denied a petition of eight railroads to suspend an Interstate Commerce Commission order reducing ex-river and straight line haul freight rates on shipments of coal from western Pennsylvania into the Youngstown area.

The ex-river freight rates from Conaway and Colona, Pa., to Youngstown are reduced from 90 to 80 cents a net ton by the order.

Shipments to Warren were put on the same basis as to Youngstown. Formerly these shipments took a higher rate.

Straight line hauls from Pittsburgh to Youngstown have been reduced from \$1.44 to \$1.37 a ton; and from Indianola and Russelton, Pa., to Youngstown from \$1.44 to \$1.32, while the rate from Leetonia district to Youngstown is cut from 94 to 89 cents.

These new rates were effective June 1. Logical sequence to this recent adjustment in freight rates is expected to be a request for a similar downward revision on shipments to other steel centers along Lake Erie.

Stay in Rail Rate Case Upheld by Supreme Court

United States Supreme Court last week refused to issue an order making effective immediately the Interstate Commerce Commission's order directing a 10 per cent increase in Class 1 freight rates in the North and a 10 per cent reduction in the South.

Nine states and 23 railroads opened the ICC order in suits which were dismissed May 27 by a special federal court in Utica, N. Y. The special court granted a 60-day stay for filing of appeals to the Supreme Court.

The government appealed the order and asked the Supreme Court to vacate it. This the high tribunal refused to do.

States opposing the ICC order are New York, New Jersey, Delaware, Pennsylvania, Maryland, Ohio, Indiana, Michigan and Wisconsin.

Higher Third Quarter Prices Set For Ferrochrome and Ferrosilicon

HIGH CARBON ferrochromium and ferrosilicon alloy prices have been advanced by a leading ferroalloy producer. The new prices are effective for contract sales on July 1, and for spot sales as of June 12. Contract prices on other ferroalloys are unchanged for the third quarter.

Price control was suspended last week effective June 12, over ferroalloys, metals and products subject to price regulation 489; ferrochromium and chromium metal; and ferrosilicon and silicon metal. At the same time chrome ores, cobalt, molybdenum, tungsten, and vanadium price control was lifted.

OPA said the supply of these items, in general, is ample to meet present demand and that the situation should continue for the foreseeable future. Suspension action was taken in amendment 26 to supplementary order 129.

The new delivered prices tabulated below are for the eastern zone and apply on contracts. Prices for spot sales are 0.25 cents per pound higher. There is a corresponding advance in central and western zone prices and the same differentials will still apply.

65% FERROSILICON, LOW-ALUMINUM GRADE°

Carload Lots	Lump	1" x D
Bulk	\$.0925	\$.0940
Packed	.1010	.1025
2000 lb to c.l.		
Packed	.1070	.1085
Less than 2000 lb		
Packed	.1120	.1135

S. M. FERROCHROME, HIGH CARBON°

Carload Lots	Lump	2" x D	8 M x D	20 M x D
Bulk	\$.1560	\$.1575	\$.1620	\$.1655
Packed	.1615	.1630	.1675	.1710
2000 lb to c.l.				
Packed	.1665	.1685	.1745	.1780
Less than 2000 lb				
Packed	.1730	.1750	.1810	.1845

SPECIAL FOUNDRY FERROCHROME°

Carload Lots	Lump	8 M x D	20 M x D
Bulk	\$.1505	\$.1365	\$.1575
Packed	.1560	.1620	.1630
2000 lb to c.l.			
Packed	.1610	.1685	.1695
Less than 2000 lb			
Packed	.1675	.1750	.1760

FERROCHROME BRIQUETS°

Carload Lots	
Bulk	\$.0920
Packed	.0950
2000 lb to c.l.	
Packed	.0980
Less than 2000 lb	
Packed	.1010

FERROSILICON BRIQUETS°

Carload Lots	
Bulk	\$.0360
Packed	.0390
2000 lb to c.l.	
Packed	.0415
Less than 2000 lb	
Packed	.0445

50% FERROSILICON, LOW-ALUMINUM GRADE°

Carload Lots	Bulk	\$.0835	\$.0850	\$.0855	\$.0870	\$.0890	\$.0905	\$.0945	\$.0980
Packed	.0920	.0935	.0940	.0955	.0975	.0990	.1030	.1065	
2000 lb to c.l.									
Packed	.0980	.0995	.1000	.1040	.1060	.1075	.1210	.1245	
Less than 2000 lb									
Packed	.1040	.1055	.1060	.1135	.1155	.1170	.1450	.1485	

50% FERROSILICON°

Carload Lots	Lump	3/8" x 12 M or						
		2" x D	1" x D	1/2" x D	8 M x D	20 M x D	48 M x D	80 M x D
Bulk	\$.0705	\$.0720	\$.0725	\$.0740	\$.0760	\$.0775	\$.0815	\$.0850
Packed	.0790	.0805	.0810	.0825	.0845	.0860	.0900	.0935
2000 lb to c.l.								
Packed	.0850	.0865	.0870	.0910	.0930	.0945	.1080	.1115
Less than 2000 lb								
Packed	.0910	.0925	.0930	.1005	.1025	.1040	.1320	.1355

HIGH CARBON FERROCHROME°

Carload Lots	Lump	2" x D	8 M x D	20 M x D	100 M x D	150 M x D
Bulk	\$.1450	\$.1465	\$.1510	\$.1545	\$.1610	\$.1650
Packed	.1505	.1520	.1565	.1600	.1665	.1705
2000 lb to c.l.						
Packed	.1555	.1575	.1630	.1665	.1750	.1770
Less than 2000 lb						
Packed	.1620	.1640	.1695	.1730	.1875	.1915

75% FERROSILICON°

Carload Lots	Lump	3/8" x 12 M or					
		2" x D	1" x D	8 M x D	48 M x D	65 M x D	150 M x D
Bulk	\$.0855	\$.0870	\$.0875	\$.0910	\$.0945	\$.0970	\$.0995
Packed	.0940	.0955	.0960	.0995	.1030	.1055	.1080
2000 lb to c.l.							
Packed	.0995	.1010	.1015	.1070	.1150	.1175	.1200
Less than 2000 lb							
Packed	.1045	.1060	.1065	.1185	.1315	.1340	.1365

75% FERROSILICON, LOW-ALUMINUM GRADE°

Carload Lots	Bulk	\$.0930	\$.0945	\$.0950	\$.0985	\$.1020	\$.1045	\$.1070
Packed	.1015	.1030	.1035	.1070	.1105	.1130	.1155	
2000 lb to c.l.								
Packed	.1070	.1085	.1090	.1145	.1225	.1250	.1275	
Less than 2000 lb								
Packed	.1120	.1135	.1140	.1260	.1390	.1415	.1440	

80/90% FERROSILICON°

Carload Lots	Lump	3/8" x 12 M or			
		2" x D	1" x D	8 M x D	65 M x D
Bulk	\$.0950	\$.0970	\$.0975	\$.1010	\$.1065
Packed	.1035	.1055	.1060	.1095	.1150
2000 lb to c.l.					
Packed	.1085	.1105	.1110	.1165	.1260
Less than 2000 lb					
Packed	.1135	.1155	.1160	.1280	.1425

90/95% FERROSILICON°

Carload Lots	Lump	3/8" x 12 M or		
		2" x D	8 M x D	48 M x D
Bulk	\$.1180	\$.1200	\$.1240	\$.1280
Packed	.1265	.1285	.1325	.1365
2000 lb to c.l.				
Packed	.1310	.1330	.1390	.1465
Less than 2000 lb				
Packed	.1350	.1370	.1505	.1630

80/90% FERROSILICON, LOW-ALUMINUM GRADE°

Carload Lots	Bulk	\$.1020	\$.1040	\$.1045	\$.1080	\$.1135
Packed	.1105	.1125	.1130	.1165	.1220	
2000 lb to c.l.						
Packed	.1155	.1175	.1180	.1235	.1330	
Less than 2000 lb						
Packed	.1205	.1225	.1230	.1350	.1495	

90/95% FERROSILICON, LOW-ALUMINUM GRADE°

Carload Lots	Bulk	\$.1245	\$.1265	\$.1305	\$.1345	\$.1360
Packed	.1330	.1350	.1390	.1430	.1445	
2000 lb to c.l.						
Packed	.1375	.1395	.1455	.1530	.1545	
Less than 2000 lb						
Packed	.1415	.1435	.1570	.1695	.1710	

° Eastern zone third quarter contract delivered prices, effective July 1; add 0.25c for spot, effective June 12. Prices in dollars per pound.

FTC Asks U. S. Steel's Petition for Pricing Order Clarification Be Denied

Commission contends corporation really asking for modification of cease and desist order in Pittsburgh Plus case. Disputes claim company discontinued pricing methods objected to by government. Sees conflict with court decision in Corn Products case

IN ANSWER to the recent petition of the United States Steel Corp. for a clarification of the cease-and-desist order in the Pittsburgh Plus steel pricing case, the Federal Trade Commission has asked the court to issue a denial.

U. S. Steel attorneys had objected to a provision requiring subsidiary companies to desist from selling "rolled steel products upon any other basing point than that where the products are manufactured or from which they are shipped." This provision, they said, if allowed to govern, would interfere with competition. They wanted a clarification under which they would have specific authority to reduce their delivered prices to as low as those charged by competitors.

"The petition for clarification," says the commission in its answering statement filed in the Third Circuit Court of Appeals, Philadelphia, "is in reality only a petition for modification of the order and is therefore already within the jurisdiction of the court under the original petition for review. The requested clarification, says the commission, would be in conflict with the law as interpreted in the court decisions in the Corn Products Refining Co. and A. E. Staley Mfg. Co. cases.

Opposes Offering of New Evidence

The commission further takes the position that the petitioners, by filing their petition for "clarification," should be deemed to have waived their opportunity to move to take evidence as to "changed conditions." This was in answer to an earlier U. S. Steel request for leave to adduce new evidence that the cease-and-desist order should be set aside on the ground that conditions have changed since the order originally was issued in 1924.

The commission's answer disputes the U. S. Steel allegation that its subsidiaries discontinued the Pittsburgh Plus method of selling.

"Much depends in this connection," the FTC statement says, "whether one interprets the Pittsburgh Plus 'method' as one that cannot exist except with Pittsburgh as the basing point, or whether the method could be employed with some other place or places as basing points . . . As a matter of fact, Pittsburgh was not the only basing point used by petitioners. According to

the commission's findings Birmingham was also used as a basing point by petitioners with a \$5 higher base price or differential, and the adverse competitive effects were found to be the same as resulted from the use of Pittsburgh as a base. Moreover Chicago was a basing point at times, as well as Pittsburgh and Birmingham.

"So it was the 'method' of quoting on a basing point other than the place of manufacture or shipment that was the Pittsburgh Plus method. And, as already

RECORD SHIPMENTS

East Works of the American Rolling Mill Co., Middletown, O., shattered all records for total shipments during May. The record was established in spite of the coal strike and the rail embargo, which prevented all rail traffic for two days. The previous high-mark had been in effect since October, 1945.

At the same time the East Works continued its record of no railroad demurrage. Since Oct. 1, 1942, no railroad cars have been delayed in the plant for more than the standard 48 hours, and during that time over 125,000 cars have been handled.

pointed out, the commission specifically found that quoting and selling on any basing point other than place of production or shipment was discriminatory and unfair."

But there is a more literal sense in which petitioners' assertions of having discontinued the Pittsburgh Plus method cannot be accepted, said the commission, and it bases this view on testimony before the Senate Military Affairs Subplus Property Subcommittee in November of 1945 by John M. Costello who appeared before that subcommittee on behalf of the Steel Committee of the Western States Council.

Mr. Costello testified, says the FTC statement to the court, "that in general the price of steel in Pacific Coast markets has reflected the basing point prices in the eastern steel production centers plus an

amount approximating the all-water transportation costs from Atlantic or Gulf ports, that this made Pacific Coast prices from \$10 to \$15 a ton higher than the eastern base prices and, most significantly of all, that this was the way steel produced in the Far West was priced. This involved the charging of 'phantom freight' and a discriminatory handicap to fabricating steel consumers very much the same as fabricators in the Middle West suffered under Pittsburgh Plus. If this testimony is to be given any weight, the corporation's claim of having discontinued the Pittsburgh Plus method can hardly be accepted."

The FTC held there is no substantiating data to support the U. S. Steel's claim that it conformed to that portion of the cease-and-desist order requiring it to show, in sales contracts and invoices, how much is charged for the steel fob petitioners' producing or shipping point, and how much for the actual transportation from such point to destination. The FTC position is that the corporation subsidiaries, in showing the base price and freight from the basing point were not necessarily showing the fob mill price and the freight from the actual shipping point to the destination.

Objects to Method Used

"Even though all mills were basing points, and even petitioners only say that important producing points became basing points," continues the FTC brief, "the petitioners also say that they used as basing points 'not only those points at which they themselves produced steel, but also certain other places at which competing manufacturers produced and still produce it; and, in quoting delivered prices of their products, they added to the base price the freight charges from the basing point nearest the point of delivery to the consumer, even though that was not the point of production of the steel to be sold.'

"Obviously, petitioners do not contract or invoice so as to show separately the base price of the competitor and the freight from the competitor's shipping point, or if they did it would not be what the order requires, a separation between petitioners' own fob mill prices and their own freight.

"We submit that petitioners are entitled to none of the presumptions that can be indulged in favor of parties who have in good faith complied or attempted to comply with these terms of the order which they now concede are valid."

Unless the U. S. Steel and its subsidiaries file a rebuttal to FTC answer, the next move in the case will be the court's disposition of the corporation's petition for clarification and of the FTC's answer to that petition.

OPA Advances Prices on Some Steel Products

Changes effective June 11 on alloy products, wire cloth, nails, staples, brads and bale tie wire

MAXIMUM prices for all alloy steel products, steel screen wire cloth, nails, staples, brads and bale tie wire were increased last week by the Office of Price Administration.

The increase became effective as of June 11 but they also apply to orders for alloy steel products and wire cloth which had been sold on an adjustable pricing basis since Feb. 15.

These increases were authorized by OPA to redistribute the maximum price increases which were effective Feb. 15 so as to better carry out the Office of Stabilization's directive on that.

Amendment 17 to RPS-6 increases the adjustment for alloy steel products to 8.2 per cent compared with the former adjustment of 4 per cent.

An increase of 50 cents per 100 pounds in prices for wire nails, staples and brads was authorized last week in addition to the adjustment of 35 cents previously made.

Amendment 17 eliminates the required discount, amounting to 20 cents per 100 pounds, on sales of bale tie wire, as compared with other forms of manufacturers' wire.

The increases in pipe and oil country tubular goods in the previous order were stated in terms of specified amounts per ton, whereas the customary method had been to price many of these items by use of a list price and discount system. The new amendment permits the same increases to be made by modification of discounts. Although this will result in some cases in price increases in excess of the dollar amounts previously allowed, there will be others where the increases will be less and the change will not result in any increase in the general price level for these products.

Amendment 17 also changes the provisions of the order which permitted the charging of extras for hot and cold-rolled carbon sheet steel and strip of selected rimmed stock steel. It was intended, OPA said, that the extras should have the effect, when considered in connection with extras otherwise authorized for aluminum killed steel, of per-

mitting appropriate charges for deep drawing quality in the products named, and the calculation of the increased revenue would accrue to the industry was made on this assumption. It was found that the former provisions did not have this result and the necessary correc-

tions are made in the latest amendment. Maximum extras for drawing quality in carbon steel sheets and strip are set, per 100 pounds, at 15 cents for 12 gage and heavier, 25 cents for 13 gage to 21 gage, and 35 cents for 22 gage and lighter.

GOVERNMENT CONTROL DIGEST

OFFICE OF PRICE ADMINISTRATION

Oil Field Equipment: Prices for oil field equipment increased, effective May 31, 10 per cent over Oct. 1, 1941, or March 31, 1942, "freeze" date price levels. This action covers drilling and producing machinery, equipment and parts; water drilling machines and equipment. It does not cover drill pipe, casing, engines and tanks. (MPR-136, OPA-T-4576)

Steel Boilers: Ceiling prices for low-pressure steel boilers increased an additional 7.9 per cent, effective June 5. The new prices are 23 per cent above October, 1941, prices and include the 14 per cent advance authorized on Feb. 10, 1946. (MPR-591; OPA-T-4594)

Pumps: An interim increase of 15 per cent over base date ceiling prices granted manufacturers of power-operated pumps and equipment when sold with the power unit; 8 per cent when sold without the power unit, effective June 5. (MPR-136; OPA-T-4600)

Metal Stampings: Maximum nonlist prices for service sales of automotive metal stampings to both automotive parts and automotive vehicle manufacturers increased 19 per cent, effective June 6. (MPR-452; OPA-T-4601)

Storage Batteries: Manufacturers' maximum prices for industrial electric storage batteries increased 10 per cent over base price levels, effective June 4. (MPR-136; OPA-T-4602)

Wire and Cable: Manufacturers of lead covered wire and cable, except armored cable, given formula by which they may automatically increase their ceiling prices for these products to cover their higher costs resulting from the recent lead price advance, effective June 4. (MPR-82; OPA-T-4603)

Copper: Maximum base prices for sales of copper by the Office of Metals Reserve increased to 14.37½¢ a pound, delivered Connecticut Valley points in carload lots and 14.50¢, less than carload lots, effective June 4. (MPR-15; OPA-T-4604)

Food Processing Machinery: Meat packing and poultry processing machinery and equipment prices increased 8.5 per cent over base date prices, effective June 7. (MPR-136; OPA-T-4616)

Stoves: Manufacturers' prices of household cooking and heating stoves increased 11 per cent over January, 1942, ceiling prices for electric ranges and 13 per cent for all other stoves, effective June 7. Manufacturers of gas, oil, coal and wood stoves previously had received a 5 per cent increase.

Cutting Tools: Price increase factor of 17.3 per cent granted Apr. 24 to manufacturers and resellers of cutting tools has been extended to apply also to repair services on the tools affected, effective June 10. Included are ground steel stock and manual tools for cutting, forming and punching of metals. Buffing and polishing wheels are not included. (MPR-581; OPA-T-4612)

Dairy Machinery: Manufacturers of dairy machinery granted an interim industry-wide 8 per cent price increase over base date (Oct. 1, 1941) price levels, effective June 10. (MPR-136; OPA-T-4622)

Switchboard Equipment: Increases averaging 13 per cent over 1941 prices have been authorized for power switchboard equipment, effective June 10. (MPR-136; OPA-T-4623)

Building Materials: Prices of certain metal plaster bases and metal plastering accessories have been increased an average of 11.4 per cent, effective June 10. The increases range from 1.9 per cent on a particular type of bull-

nose lead to 22.8 per cent for a particular type of 3.4 pound metal lath. (MPR-592; OPA-T-4624)

Mowers and Electric Appliances: Ceiling prices on repair and replacement parts for hand lawn mowers and small electric appliances increased 28 and 18 per cent, respectively, at all levels of sale, effective June 15. (SR-15 to GMPR; OPA-T-4627)

Store and Office Machines: Store and office machine manufacturers applying for individual firm reversion adjustments on and after June 15 will take 7.5 per cent over adjusted costs to arrive at a reversion ceiling, instead of the 8.9 per cent allowed since last fall. (SO-119; OPA-T-4632)

Lead Pigments: Effective June 7, ceiling prices on lead pigments and paste products increased an average of 20 per cent, or about 1.25 cents a pound. The action applies to any lead pigment or pastes containing 50 per cent or more of lead and including basic lead carbonate and sulfate, litharge, red lead, lead chrome color pigment and white lead and red lead in oil. (MPR-180 and 188, SR-14F; OPA-T-4637)

Exemptions: Following products have been exempted from price control, effective June 12: Chrome ores, cobalt, ferroalloys, metals and products covered by MPR-489; ferrosilicon and chromium metal; ferrosilicon and silicon metal; molybdenum; tungsten, vanadium. The following refractory products have also been exempted from price control: Basic refractory brick, crude and ground refractory fireclay, fire-clay brick, hot tops, ladle brick, low-temperature mortars, runner brick, silica brick, silica cement, sleeves and nozzles, and super clay and high alumina refractories. (SO-129)

Storage Batteries: Manufacturers of lead acid storage batteries and cells and plates used in them may raise, for each 1 cent per pound increase in the lead price, their maximum net prices 1.25 cents multiplied by the number of pounds of lead in such product. This action, effective June 11, grants sellers only the actual increase in their costs due to the higher lead prices by requiring them to first find out the existing maximum net prices without the additional factor for the lead increase factor. Then they add the lead increase factor to prices that already reflect a previous 10 per cent interim increase. (MPR-136; OPA-T-4647)

Vitreous Enamel Frit: Manufacturers' prices for vitreous enamel frit increased 10.4 per cent, effective June 10.

CIVILIAN PRODUCTION ADMINISTRATION

Lead: Permitted octane content of premium type gasoline reduced from an 80 to a 78½ rating at the refinery, effective June 1. Monthly quota for use of ethyl fluid reduced from 27 per cent of the base period for all types of gasoline to 27 per cent for regular gasoline and 22 per cent for premium gasoline. (L-355; CPA-395)

Copper and Brass Products: Sales of brass mill and copper wire mill products and copper and copper-base alloy scrap now may be made by the War Assets Administration only to buyers who certify that their resulting inventory will not be more than their immediate needs for 90 days or, in the case of persons buying for resale, that they will promptly reoffer the material acquired. CPA will issue special directives requiring delivery of particular lots of these products to smelters, brass mills or copper wire mills for further fabrication or to users who have less than a five-day inventory on hand. (PR-13; CPA-402)

House Small Business Committee Threatens Steel Priority Action

Representative Patman assails Civilian Production Administration for "hands off" policy on distribution of steel. Asserts little consumers who were not prewar customers of mills are being neglected. Charges discrimination against new firms

LATEST development in the long-standing grudge of the House Small Business Committee against the Civilian Production Administration is a threat to initiate legislation to provide priority assistance to small businesses requiring steel "unless appropriate administrative action is taken promptly."

Ever since the beginning of the steel strike, says Rep. Wright Patman (Dem., Tex.), committee chairman, the CPA has adopted a hands-off policy concerning the distribution of steel.

"In the period of the most acute steel shortage in recent times," states Representative Patman, "CPA has refused to direct the distribution of steel even to the most urgent small plant hardship cases. After settlement of the steel strike, the coal strike was given as the reason for the agency's refusal to reinstitute priorities over steel.

"CPA asked the steel mills to take care of their customers on an equitable basis. The result has been that steel mills have taken care of their good prewar customers on a sort of pro-rata basis, and those small plants which did not enjoy a favored prewar position with their suppliers have been passed by.

"The effect of CPA's hands-off policy has resulted in outright discrimination against thousands of small plants. Cases of small plants suffering unusual hardship, when brought to CPA's attention, were turned down with the statement that the hardship was similar to thousands of other small plants. Yet, at the same time, large plants, with established positions, were receiving continual, even though reduced, shipments."

Mr. Patman has requested CPA Administrator Small to reinstitute steel priorities immediately. The committee is keeping careful record of all the complaints it receives from small interests over inability to obtain steel.

Army To Test Ground Force Equipment in Arctic

Manufacturers interested in cold-weather performance of such of their products as are useful to the armed services should get in touch promptly with the War Department which now

is drawing final plans for testing Army Ground Forces equipment under winter conditions. The program includes all types of AGF apparatus, including tanks, self-propelled guns, radars, special snow vehicles, new rations, kitchens, clothing and everything else. Task forces will leave shortly for Fairbanks, Alaska, Camp McCoy, Wis., and Adak, Alaska, to prepare for the tests which will be conducted over the period Oct. 1, 1946-April 30, 1947.

In these locations the tests will be conducted under varying conditions, with temperatures down to -66 degrees Fahr., accumulated snowfall up to 5 feet, continual rain and fog, alternate daily freezing and thawing, and the sudden arctic storms.

Asks Division of Credit, Welfare Housing Agencies

Complete separation of housing agencies of the federal government which are concerned with credit from those concerned with welfare was urged recently by the Chamber of Commerce of the United States. Its viewpoint was expressed by George W. West, chairman, Construction & Civic Development Department Committee.

Testifying before the House Committee on Expenditures in the Executive Departments, Mr. West disapproved President Truman's Reorganization Plan No. 1, which proposes permanent status for the National Housing Agency.

Congress To Consider New World Calendar

A bill soon to be introduced in Congress calls for adoption of the World Calendar, already approved by 14 nations. The World Calendar retains the present 12 months but revises slightly the number of days in each so as to result in four quarters of 91 days each. The first month in each quarter has 31 days and the other two 30 each. This makes a total of 364 days for the year. The 365th day of the year is sandwiched between Dec. 30 and Jan. 1 and is called Dec. W—meaning December World Holiday. An extra

day known as June W is inserted between June 30 and July 1 in leap years to account for the 366th day.

Sponsoring organization is The World Calendar Association Inc., 630 Fifth Avenue, New York 20, which has compiled a booklet analyzing the World Calendar.

The World Calendar presents some advantages which have been gained by a number of steel companies through the adoption of a year consisting of 13 periods of four weeks each. This makes for smoother payroll calculations, more accurate cost accounting, and for more informative production comparisons.

AFL, CIO Represented In Department of Labor

In naming three assistant secretaries of labor, President Truman had continued the custom of the administration in recent years to give equal recognition to the American Federation of Labor and the Congress of Industrial Organizations, with other unions still out of the picture. The three new assistants to Secretary Schwellenbach are John W. Gibson, David A. Morse and Philip Hannah.

Mr. Gibson, former CIO director in Michigan, has been serving as first assistant to the secretary since the resignation of Daniel W. Tracy, formerly president of the AFL-electricians' union who has taken a liaison post with the International Labor Organization. Since he joined the department last year, Mr. Gibson has taken a major part in representing the Labor Department in important dispute cases, particularly those involving the coal and automobile industries.

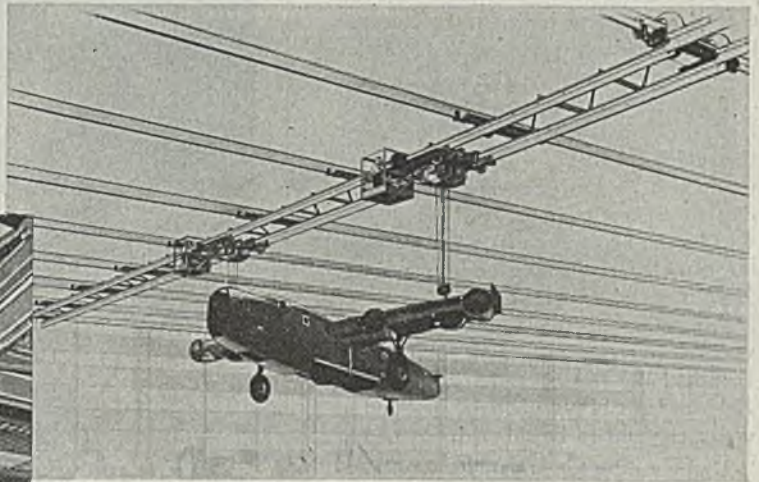
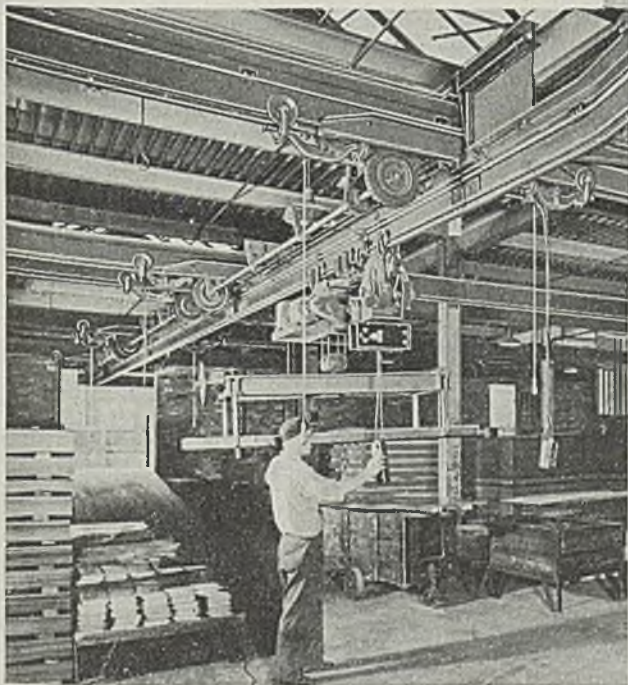
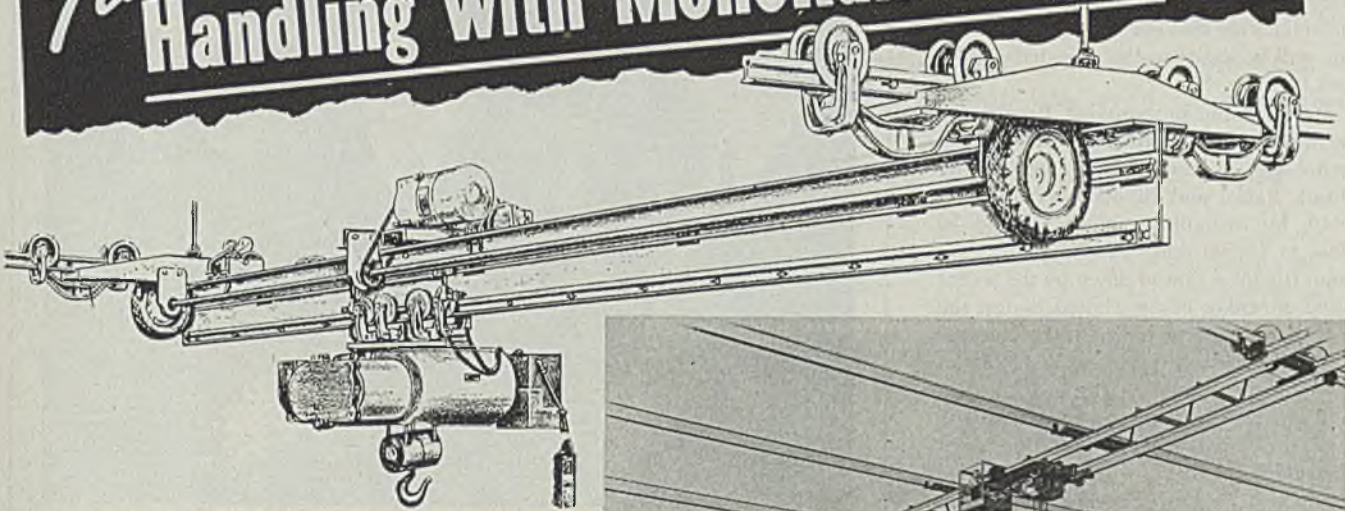
Mr. Hannah comes from Cleveland where he has been secretary-treasurer of the Ohio State Federation of Labor. He was proposed by President William Green of the AFL.

Mr. Morse, an attorney of Newark, N. J., has been general counsel of the National Labor Relations Board. During part of the war he was a lieutenant colonel, serving the Allied Military Government in Europe in connection with labor matters.

Equipment Procurement Delay Slows Tin Output

Aside from Banka in the Netherlands East Indies, progress in expanding tin production in the Far East continues slow. This is particularly true of British Malaya where British authorities early this year drew up an expected production schedule calling for 12,000 tons in 1946, 48,000 tons in 1947, 72,000 tons

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in 1948, and a leveling-off rate of about 73,000 tons in 1949. Based on equipment from British industry, this program has been set back at least a year because of a bad procurement situation. Present indications are that even the 1946 production will be less than the expected 12,000 tons.

Most notable progress has been made on the island of Banka where the Dutch again are in control and are driving ahead. Banka and Billiton production in 1946, by hydraulic methods, should be close to 10,000 tons. The long-term program has been slowed down by the recent wave of strikes in the United States; the two dredges being built by the Bucyrus Erie Co., South Milwaukee, Wis., cannot be shipped as soon as expected.

These two dredges, and two from Holland, are slated to be in operation about the middle of 1947, which should bring production in the Netherlands East Indies to an annual rate of about 40,000 tons by the beginning of 1948. At present the expected production performance for 1947 is set at about 27,000 tons.

Production at the Texas City, Tex., smelter at average rate of 42,500 tons pig tin annually is assured over rest of 1946 on basis of raw material on hand or under contract to be shipped.

Under a rider to sugar subsidy act Congress recently authorized Reconstruction Finance Corp. to continue tin subsidy program as directed by the CPA and negotiations are now under way for imports of tin concentrates after year's end. Indications are that 1947 Texas City pig tin production rate will show some decline. This is because of likelihood that considerable portion Bolivian concentrate now coming to Texas City will go to United Kingdom. Also the United States will not receive any high grade concentrate from Belgian Congo next year if present plan to ship it to a smelter in Belgium is carried out.

Three Ordnance Engineers Retired After Long Service

Three key engineers, Orié L. Beardsley, W. Floyd Beasley and George W. Beatty, have retired from the Ordnance Department, United States Army, after services of 35 years each. Widely known in the metal working industries, Mr. Beardsley was responsible for the development of our present light and medium field artillery, Mr. Beasley for tanks and combat vehicles, and Mr. Beatty for antiaircraft artillery, and, more recently, rocket materiel and long-range guided missiles. Their achievements were recognized at a testimonial dinner in Washington June 7, presided over by Maj. Gen. Everett S. Hughes, the new chief of ordnance.



PRESIDENT'S CHOICE: Fred Vinson, left, nominated to be Chief Justice of the United States, and John Snyder, right, who has been named to succeed Mr. Vinson as Secretary of the Treasury, pose with Mr. Truman after their nominations were announced. Mr. Snyder's former position as director of the Office of War Mobilization and Reconversion will be abolished.
NEA photo

Charge Steel Sent to England for Rehabilitation Being Re-exported

American manufacturer complains British use U. S. steel to undermine American markets in South America. Cites sales by England to Argentina, after latter's purchasing mission had been discouraged from buying here

ARGENTINA is placing heavy orders for steel and fabricated steel products in England, as a result of the United States government's policy on exports from the United States to the Argentine, according to complaints received in Congress from American steel interests both in the states and in South America.

A large American manufacturer recently complained that materials being exported from critically short American stocks, ostensibly for rehabilitation abroad, are apparently being used to undermine the American market in Argentina, if not elsewhere.

"If the materials we give them were used to rehabilitate England, I do not believe there would be any criticism," this manufacturer wrote a member of Congress, "but when such materials as are sent them are used by them or any other nation to eventually destroy our own United States markets, I believe Congress should do something about the matter."

Another letter was from the South American representatives of the Argentine subsidiary of an American steel company, and reported that notwithstanding high prices and longer delivery, Argentine authorities had decided to place their order for material referred to in an earlier letter, with British manufacturers.

The Argentine government sent a purchasing mission to the United States first, but this group was so discouraged at the prospect of getting any material authorized for export, that it later went to England.

There the mission was assured there would be no restrictions on export, and they placed their order.

"This is not the only business we are going to lose if the United States insists on its present policy of restricting export of materials to the Argentine government," the American steel company's South American representative stated, "while England and some European

countries deliver everything they want."

The Argentine mission was stated to have placed orders in England and in Europe, valued at \$1,200,000, covering such materials as 450 tons of sucker rods, and 1000 tons of casing, in England; 3000 tons of casing and 500 tons of tubing, with Belgian firms.

Bids for "Inch" Pipelines Will Be Opened on July 31

Closing date of bids for the purchase or lease of the Big Inch and Little Big Inch pipelines has been set by the War Assets Administration for July 30. John J. O'Brien, WAA deputy administrator, has requested that prospective bidders discuss their proposals with him beforehand so that they may be checked and analyzed before being committed to writing.

The WAA has revealed a reversal of previous thinking about the use to which the lines should be put by buyers or lessees. It continues to state that in disposing of these lines first preference will be given to continuing both lines in petroleum service, "thereby assuring availability of the lines in the event of a national emergency." However, WAA goes on to say that "offers calling for the conversion of the lines to natural gas transport will be entertained and are invited." Bids will be opened July 31.

Additional 9476 Tons of Tin Allocated in First Half

Additional allocations of tin, amounting to 9476 long tons, for first half of this year have been announced by the Combined Tin Committee. The largest amount was allotted to France, 2840 tons, with the United States second, 2350 tons, and Canada third, 1070 tons. Other major allocations in tons, were as follows: India 640, Italy 533 (including 33 tons for a United Kingdom canning contract with Italy), Latin America and Switzerland 400 each, Sweden 300, Netherlands 240, Russia 202, Finland 150, Denmark 140, and Turkey 100.

Architectural Porcelain Enamel Standards Approved

Standard specifications covering the manufacture of architectural porcelain enamel have been officially approved and adopted by the Architectural Division of the Porcelain Enamel Institute. The standards prescribe in general detail the proper materials and methods to be used in designing, fabricating and processing parts for architectural porcelain enamel.

NHA Boosts Use of New Building Materials in Vets' Housing Program

Wyatt says agency is working with manufacturers and assisting them with technical problems. Most new products are panels or entire dwellings of light-weight concrete or structural panels made from plastics, light metals or other lumber substitutes

NEW building materials will find large markets in the construction of homes under the Veterans Emergency Housing Program, and a promising array of such materials already are under development, according to Wilson W. Wyatt, national housing expeditor and administrator of the National Housing Agency.

"While utilizing all possible means to expand production of traditional materials we also are encouraging the full development of new materials," said Mr. Wyatt. "Recent passage of the Patman Act provides tools with which to increase production of both new and traditional materials. The two most important tools are premium payments and guaranteed markets.

"We are working with manufacturers and are not only investigating their claims but are assisting them in every possible way with their technical problems so that the materials can be made available rapidly."

A preliminary study of 68 products indicated that 30 of them are promising for use in the emergency housing program. The products fell into two classes: Panels or entire dwelling units made from light-weight concrete, and structural panels made from plastics, aluminum and other substitutes for lumber and plywood.

Use of Metals May Increase

So far attempts to use metals in this program have been rather limited, but some of them show promise. Gluing scarce plywood to sheet metal has been found to increase the strength and rigidity of structural sheets while reducing the quantity of plywood otherwise required for comparable strength. In other cases structural sheets have been produced by binding or covering plastic sheets with metal sheets. One type of panel is built up of two sheets on a structural frame of lumber or sometimes steel; some panels have insulating material enclosed between the sheets, while others rely on the insulating value of the sheets and the dead air space between them.

A new single-thickness panel consisting of a honeycomb plastic core with

aluminum faces has good insulating qualities and high strength and yet is very light in weight. Production methods so far developed promise a very low unit cost.

"As hopeful as the newly-developed materials are," says Mr. Wyatt, "there are still two handicaps to the widespread use anticipated for them. One is the problem of joining together some of these new panels. Another is antiquated building codes that, based on conventional materials, require a certain wall thickness regardless of the strength of the material. Both problems are being tackled—with all communities being urged to modernize their codes."

List of Critically Scarce Products Revised by CPA

Civilian Production Administration has made public a revised list of critically scarce products, the producers of which may be granted urgency certificates to purchase surplus equipment from the War Assets Administration. These certificates give the holders precedence over any other class of buyers on WAA stocks of surplus equipment; are granted only to producers of the products listed in schedule I of priorities regulation 28 who can demonstrate that the equipment is urgently needed to sustain or increase their production; and are valid for 60 days after issuance. All applications are made on CPA form 4425.

Recent additions to the schedule of critical products include, in part: Asbestos-cement and flat sheet specialized machinery; asphalt and tarred roofing products specialized machinery; warm air furnaces; gypsum board and lath specialized machinery; certain types of plumbing fixtures; large power presses; copper magnet wire; lead; convector radiation. The schedules already included, in part: Electrical high-silicon sheet steel; fractional horsepower motors; concrete building products machinery and equipment; malleable and gray iron castings, including cast iron soil pipe, cast iron radiation, and railroad car brake shoes; coal mining machinery; coal in specified areas; clay building products machinery; titanium dioxide.

Pre-Approval of Wage Increases Is Still Required for Pricing Purposes

Some manufacturers denied price relief because prior approval of higher wage rates was not obtained. Applications for approval being filed at rate of 900 to 1200 weekly with regional offices of Wage and Hour Division of Labor Department

ALTHOUGH nearly four months have elapsed since issuance of the latest stabilization directive—Executive Order 9697, Feb. 14, 1946—many employers still do not understand the yardsticks used by the government in deciding when prices may be advanced on the basis of wage increases.

Many manufacturers have been denied the right to use wage increases in applying for higher prices on their products because they started to pay higher wages without obtaining pre-approval. Other manufacturers will find themselves in trouble for the same reason. Another group is in trouble because it has ignored the rule under which advance approval must be obtained for wage schedules in new plants or new departments.

Most manufacturers have a basic understanding of the existing wage-price controls as attested by the fact that applications for approval of wage increases currently are coming in at the rate of 900 to 1200 weekly. Nevertheless, most of them have doubts on numerous angles; to answer these questions meetings now are being held in cities over the country by regional representatives of the Office of Price Administration and the National Stabilization Board.

Consultation with WSB Advised

Government officials have been trying hard to set up simple rules for the stabilization of the price-wage relationship. In many cases an employer is safe in going ahead on the basis of the rules as they exist today. But there is many a chance for a slip—so that the smart employer will not make any wage changes without consulting with the nearest office of the Wage Stabilization Board.

With a few exceptions, wage increases may lawfully be granted in any amount at any time without the approval of any government agency. The exceptions are: 1—All wage increases in the building and construction industry (to workers employed on the site) must have prior approval of the Wage Adjustment Board, Washington 25, D. C.; 2—new wage rates for new plants or new departments of existing plants must have the prior approval of the Wage Stabilization Board; 3—wage increases to agricultural labor must conform to ceilings set by the De-

partment of Agriculture; 4—certain inequity adjustments in the basic steel industry still require Wage Stabilization Board approval (these adjustments are in the hands of the board's Steel Commission, Benedum-Trees building, Pittsburgh, which can correct inequities involving increases up to 5 cents an hour); and 5—increases in salaries over \$5000 must be approved by the Treasury's Salary Stabilization Unit.

While wage increases in most industries and plants can be made lawfully in any amount, the catch comes in the proviso that wage increases have to be approved by the government before they can be used as a basis for seeking price relief.

To simplify procedure as much as possible, the government has set up certain

categories of cases in which blanket pre-approval is given, and in which employers do not have to file individual applications. Advance approval has been given to the following classes of wage increases:

1—Any increase lawfully made prior to Feb. 14, 1946.

2—Any increase made at any time in accordance with a governmental recommendation announced before Feb. 14, 1946.

3—Increases made by employers of eight or fewer persons, unless the wages of these employees have been governed by a master contract or similar contracts on an industry or area-wide basis.

4—Increases providing for a maximum of six paid holidays a year.

5—Increases providing for night shift differentials not exceeding 5 cents an hour for the second shift or 10 cents for the third shift.

6—Increases providing for paid vacations of no more than one week after one year's service and two weeks after five years.

7—Increases to bring hourly rates up to 65 cents an hour "to correct substandard wages."

8—Increases made at any time based on certain changes in an incentive plan, provided that the changes maintain the



NEW NAVY UNDERSECRETARY: John L. Sullivan, formerly assistant secretary of Navy, has been nominated by President Truman to be undersecretary. Here he is shown being congratulated by Secretary James V. Forrestal. NEA photo

established relationship between earnings and effort.

9—The institution of an incentive plan for a new production item in line with an established incentive schedule in operation in the same part of the plant before Feb. 14, 1946, or approved later.

10—Increases made at any time in accordance with a plan in effect before Feb. 14 or approved later for merit, progression, bonus or length of service increases.

11—Increases made at any time to eliminate or correct intraplant inequities under a job evaluation plan established before Feb. 14 or approved later.

12—Increases given blanket approval by "pattern orders" or other general orders which have been or will be issued by the Wage Stabilization Board.

The executive order of Feb. 14 and new regulations establish four groups of standards for approval of wage increases during the remainder of the period in which prices and wage controls are in effect. The following kinds of increases may be approved by the government:

1—Increases in line with a general pattern of wage or salary adjustments which has been established in a particular industry, or related industries in a particular local labor market between Aug. 14, 1945, and Feb. 14, 1946;

2—Increases necessary (where no such pattern was established) to eliminate a gross inequity between wage rates or salaries in related industries, related plants in the same industry or locality, or related job classifications in the same plant;

3—Increases necessary (where no such pattern was established) to make the average increase in wage rates of employees in the appropriate unit since Jan. 1, 1941, equal the percentage increase in the cost of living between January, 1941, and September, 1945;

4—Increases falling within the wartime wage standards in effect on Aug. 17, 1945.

Under the law, no wage decreases whatever may be made without government approval. After V-J Day last year it was expected that it was only a matter of time before many employers would seek approval for wage decreases. The Wage Stabilization Board went to the trouble of formulating an extensive set of rules to govern action on applications for decreases. But this book of rules never was issued, for there has not been much interest in reducing wages. Not more than 20 applications for approval of wage decreases are received weekly. And strangely enough, about two-thirds of these applications are being approved. In recent weeks 134 applications for wage decreases were approved and 69 denied.

The board has authority to approve a decrease to the highest level that was paid in a plant between Jan. 1, 1942, and Feb. 15, 1942. It also has authority to correct gross inequities and "to aid in the effective transition to a peacetime economy." In some cases where the employer has adduced substantial evidence he even has been permitted to decrease wages to less than the January-February level in 1942. The approvals of wage decreases in some cases have knocked out unduly costly paid vacation plans, year-end bonuses, and freak rates out of proportion with other wage rates in a plant.

It will save time if the employer submits his application for a wage increase or decrease to the nearest regional office of the Wage and Hour Division, U. S. Department of Labor, which will process the application and hand it along to the proper regional office of the Wage Stabilization Board. The division has some 70 regional offices all over the country.

Applications for approval of adjustments of salaries involving more than \$5000 annually should be made, as before, to the regional offices of the Salary Stabilization Unit, U. S. Treasury Department.

For the bulk of the wage changes, which must be approved by the WSB for pricing purposes, the important thing for employers to remember is that they must fill out one of two forms in order

to protect their right to apply for price relief on the basis of wage increases.

One is Form 9 in which the employer serves notice that he is making a wage increase in his plant without any present intention of seeking a price adjustment but reserving his right to apply for approval of the increase for pricing purposes in the future if he should find his higher labor costs make a price increase necessary. The other is Form 10 on which an employer seeks approval, for pricing purposes, of a wage increase. Copies of both forms may be had from the nearest Wage and Hour office.

So far nine "general wage approvals" have been issued, covering allowable wage increases, for pricing purposes, in steel, meat packing, shipbuilding, refractories, West Coast lumber, electrical manufacturing, nonferrous metal mining and, on May 31, in coal mining.

Although it is popularly believed that wage increases of 18½ cents an hour have been approved generally by the government for pricing purposes, this is not true. Every day the regional boards are approving increases down to 10 cents an hour. The Wage Stabilization Board has not attempted to average up the wages it has approved so that no official figure is available. One guess in a well-informed quarter, however, is that the median of the wage increases approved by the WSB for pricing purposes is somewhere in the neighborhood of 14 cents an hour.

Bureau of Labor Statistics Notes Upward Trend in Man-Hour Productivity in 1945

LABOR'S productivity in 1945 reflected the first general increase since the war, according to preliminary tabulations from a survey just completed by the Bureau of Labor Statistics. In 25 of 29 industries studied, 1945 man-hour output showed at least moderate increases over 1944.

"It is probable," the bureau states, "that the increases in productivity thus far experienced mark the beginning of a general upward trend. As materials and labor become more readily available and as plants resume operations at normal capacities, increases in output per man-hour should be forthcoming. Additional increases should follow the installation of new machines to replace outmoded equipment and the application to peacetime production of new techniques learned during the war."

Another alteration in general trend, says the bureau, is notable. Although average hourly earnings increased in all 29 industries between 1944 and 1945,

higher productivity levels brought about a reduction in unit labor costs in 11 of the industries. In five other industries increases were less than 2 per cent.

Figuring 1939 at 100, the 1945 indexes for man-hour productivity for different industries are as follows: Beet sugar refining 88; boots and shoes 110.6; bread and bakery products 126.1; cane sugar refining 92.2; canning and preserving 120.8; fertilizers 113.2; flour and grain-mill products 93; glass products 121.3; hosiery 137.9; ice cream 153.1; leather 115.4; malt liquors 92.5; newspaper and periodical printing and publishing 88.7; nonferrous metal smelters and refineries 95.9; paints and varnishes 120.3; paper and pulp 95.2; petroleum refining 94; rayon and allied products 151.0; slaughtering and meat packing 111.0; tobacco products 118.7; woolen and worsted goods 118.2; cement 89.4; clay construction products 89.2; condensed and evaporated milk 112.3; confectionery 117.8; cotton goods 100.7.

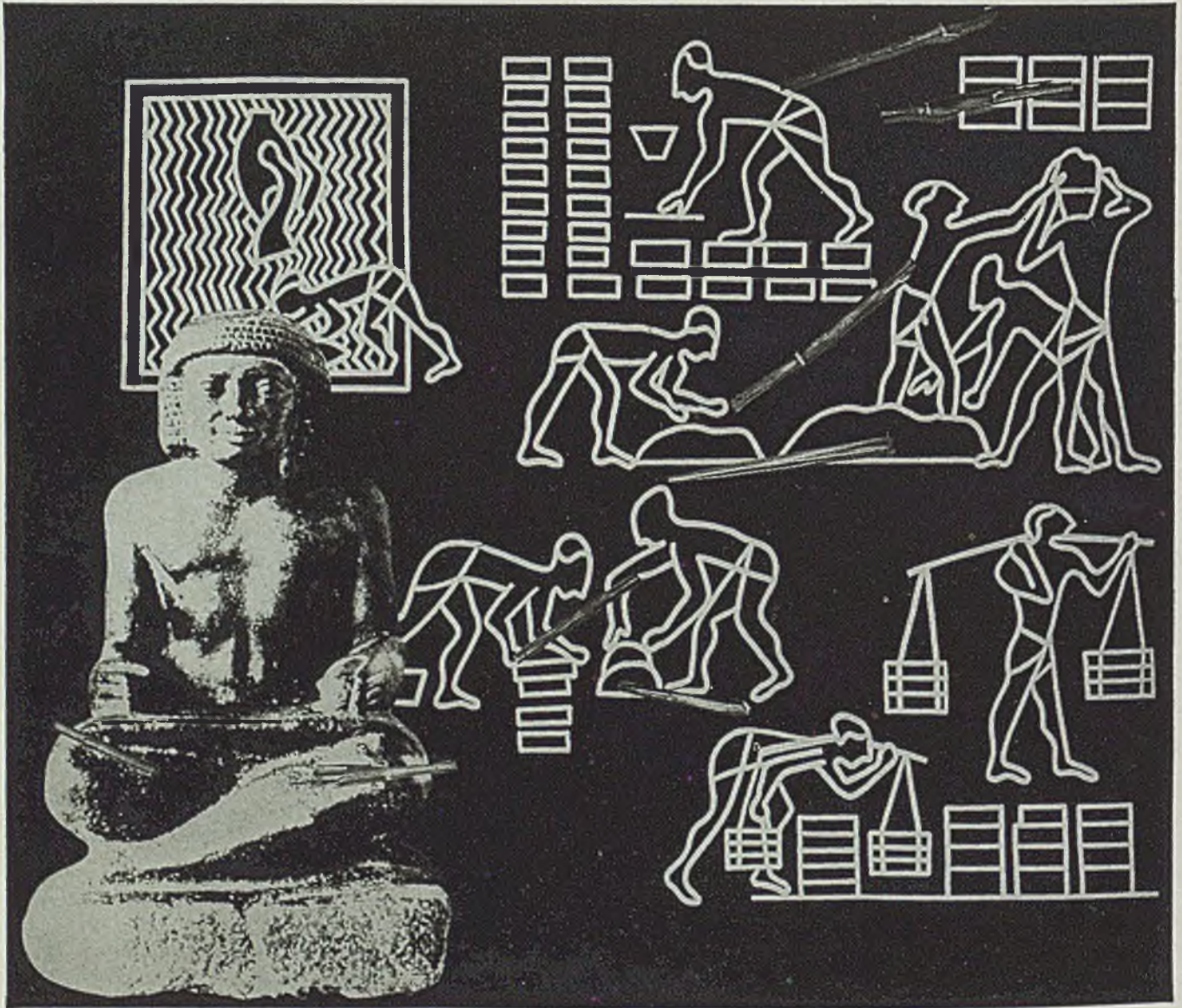
BRICKS WITHOUT STRAW

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.

Hardenability in steel is analogous to straw in bricks. Leave it out and you invite trouble in.

Molybdenum steels combine good hardenability with economy, thus insuring good performance on a practical cost basis.

The Pharaoh may possibly have lacked data on the importance of straw in bricks—but there is readily available to all steel users a wealth of practical facts on the advantage of molybdenum-containing steels. Investigate *now!*



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CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.

Climax Molybdenum Company
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mirrors of MOTORDOM

Automobile makers scale down forecasts of production. Some statisticians now see 4,500,000 as tops in 1947 with peak reached in 1948 with something under 6,000,000. Top executives doubt that current backlog of new car demand is as high as 16,000,000

DETROIT

SHARPENING their pencils and shining their crystal balls, automotive industry statisticians are now coming up with forecasts their plants will not be able to move up to the dreamed-of annual production rate of 7,500,000 cars and trucks for a couple of years, if at all, because there will not be enough steel to satisfy such output and still cover requirements for replacement parts.

Why it took them so long to complete their calculations no one seems to know. Perhaps current difficulties in obtaining desired quantities of materials sent them scurrying to their slide-rules in the effort to chart more realistically the years just ahead.

At any rate, Ford and at least two other companies have been taking a look at the steel situation and the gist of their conclusions is that 1947 auto production will be restricted to around 4,500,000 and moving up the following year to a ceiling of something under 6,000,000.

The figures are arrived at by applying the industry's "historical" percentage consumption of the country's steel output against the steel industry's rated capacity and then translating the result into numbers of cars and trucks. It appears a dangerous generalization and could logically lead to the suggestion that since the auto industry would like to expand its previous peak production by 50 per cent, then the steel industry should be drawing up plans to expand its ingot output proportionately. What is forgotten is that over the years before the war, the steel industry operated on an average far below its rated capacity, even though the automobile plants were setting new production records. So the auto industry's percentage of finished steel consumption must be reckoned against actual operating rates and not against the steel industry's rated capacity.

Thus, in 1937, while the auto industry was turning out 5,000,000 cars and trucks, the steel industry saw its operations climb slowly to the 70-90 per cent range after six long years of stagnation at the 30-60 per cent level and then

recede at year-end to 23 per cent. Peak steel operations during war years have no bearing, of course, on steel for automobiles, but if it is possible to maintain capacity steel operations over the next couple of years, it is this observer's opinion that by the end of this year the automobile industry will be able to buy just about all the sheet, strip, bars and whatnot it requires for any contemplated production level.

Consider, for example, the fact the

Automobile Production			
Passenger Cars and Trucks—U. S. and Canada			
<i>Tabulated by Ward's Automotive Reports</i>			
	1946	1941	
January	121,861	524,073	
February	83,841	509,332	
March	140,777	533,878	
April	248,318	489,856	
May	243,000*	545,321	
Week ended:			
May 25	53,020*	133,560	
June 1	31,895*	106,395	
June 8	43,175*	133,645	
June 15	50,000*	134,682	
* Preliminary			

steel industry as of last year had rated capacity for over 36,000,000 tons of hot-rolled and cold-rolled sheet and strip annually. Consign, if you will, 40 per cent of the total to automobiles and you have more than 14,000,000 tons. The average car requires scarcely more than a ton of flat-rolled, so there is indicated capacity, at least, for 14,000,000 cars. Here again, however, the conclusion is dangerously inadequate since there are so many other materials and components going into motor vehicles. To base any projection on steel capacity alone is short-sighted, if not meaningless.

M. E. Coyle, new executive vice president of General Motors, confirmed some of the statisticians' fears in a recent ad-

dress when he said the industry would hit full stride in 1948, but that 5,000,000 passenger cars and a little over 1,000,000 trucks was "as high as we will attain under the best of circumstances." He also echoed the sentiments of some other top executives in doubting that the current backlog of new car demand was as high as 16,000,000 units. He feels the industry will catch up with demand far more quickly than many suspect.

This new thinking conceivably may presage a change in plans which General Motors has publicly disclosed for expansion of facilities. Last year the corporation was talking about effecting a 50 per cent increase in its plant, or in other words, buildings and equipment to permit turning out 50 per cent more cars and trucks than in 1941. It appears now this figure is being scaled back to more like 25 per cent.

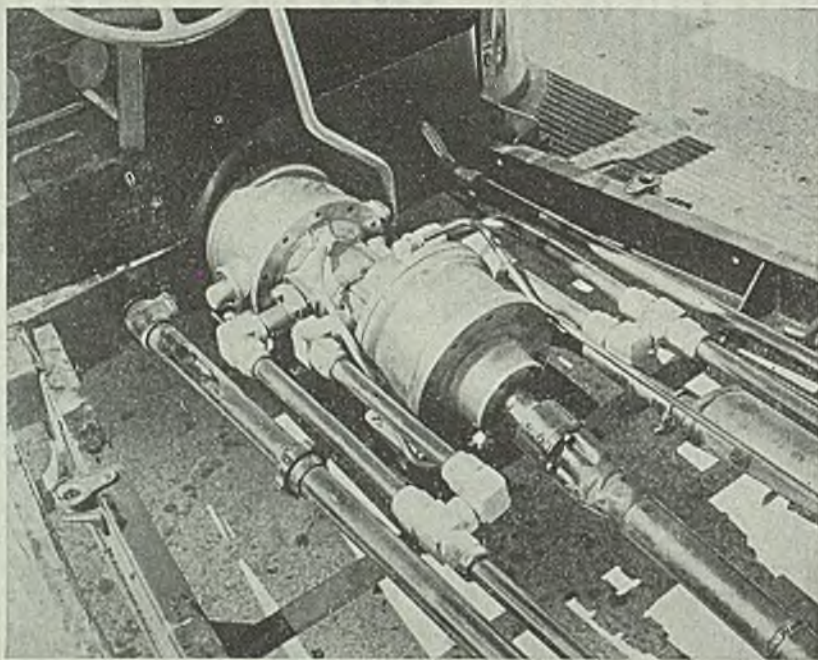
Bitterness Follows Jubilee

Backwash of the automotive Golden Jubilee has carried along with it the usual quota of bitterness, ruffled feelings and private squabbles which any event of its size and scope is bound to generate. Most of the errors charged to the staff of the Automobile Manufacturers Association, which directed the affair, were ones of omission rather than commission. The slighting of great names like C. E. Sorenson and the Fisher brothers probably was not deliberate but the unavoidable consequence of the speed and high-pressure under which the event was whipped into shape and staged.

The ruffled feelings of imported celebrities, stage stars and entertainers can be chalked up principally to the natural temperaments of people in these professions who felt that about all they had to do was to appear in Detroit and they would be presented with new cars, names in lights and police escorts. Instead, some of them paid their own expenses, received no remuneration and may have been slighted more than once in the heat of confused arrangements.

Nevertheless there may be repercussions growing out of some of the hurt feelings. One is a reported reshuffling of personnel in the AMA, including the naming of a new director to succeed George Romney. Most likely prospect talked of for the post is Robert F. G.

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HYDRAULIC DRIVE: This experimental unit is installed by Superdraulic Corp., Detroit, in 1937 Plymouth chassis (STEEL, June 10, p. 74). There is no direct connection, other than hydraulic fluid lines, between the two cylindrical units, the forward one being a variable-pressure 40-horse-power hydraulic pump direct connected to the engine and powering the triport hydraulic motor directly behind it. The motor in turn operates the propeller shaft, driving the car through conventional differential with gear ratio of 4:1. The pump is of the reversible type, being controlled through the lever extending upward at the right. The hydraulic system contains 25 gallons of fluid, pipelines leading to an oil reservoir and radiator mounted at the rear of the chassis. An auxiliary super-charger pump, belt driven off the engine and not shown in the illustration, is used to maintain about 100 pounds pressure on the low-pressure side of the pump. Top speed of the experimental unit was about 17 mph, but by changing gear ratios it is expected to be able to attain 35 mph. Next step in the development is to adapt hydraulic motors to each of the rear wheels, eliminating propeller shaft and differential

Copeland, former head of the Detroit office of Arthur Kudner Inc., and chairman of the Jubilee's publicity committee. He resigned his advertising post recently, ostensibly to write a book, but as someone observed, "You can't eat by writing a book."

The most elaborate financial report ever to be issued by Briggs Mfg. Co. here came from the presses last week. The company reveals it has tooled its auto body and parts plants for an eventual increase of 80 per cent in output over the 1941 level. A large measure of this springs from the undertaking of all Packard body production which will be concentrated in a 700,000-sq ft plant on Conner Avenue, built for air-frame manufacturing during the war. Six other plants operated before the war are being continued in service, plus a bomber turret plant with 500,000 sq ft of floor space, built during the war and now

converted to automotive production. When these new plants and additions to old plants are added to those owned and operated before the war, total floor space available for postwar work is in excess of 6,725,000 sq ft, or 40 per cent better than prewar.

To convert war operations to civilian output had cost the company by last December, including necessary new machinery, buildings, equipment and re-conversion expense, better than \$9.5 million. More than 5900 machine tools, 15,000 portable tools and testing equipment and 30,000 pieces of furniture, fixtures and the like had to be moved out, all the floor space devoted to war work had to be cleared and put into condition for peacetime operation, more than 32 miles of conveyors had to be installed, and thousands of machines relocated and retooled.

Expenditure of \$1.5 million alone was

made for reconditioning body jigs, dies and fixtures, idle during the war.

Briggs plumbing war divisions also are being groomed for a 60 per cent expanded output, or about 31,000,000 pounds of bathtubs, sinks, basins and other equipment a year. In the first three months of this year alone, better than 30,000 bathtubs and 55,000 kitchen sinks in various models were shipped.

Condensed statements covering the past eight years of operation show the company in a most comfortable financial position, with earned surplus of over \$26.5 million, a new high for the period.

Initial production of five additional models is announced by Packard. Until now, assemblies have been limited to the Clipper 8-cylinder four-door sedan, of which approximately 11,000 have been shipped. Now going on the lines are the Clipper 6-cylinder, a super eight, a custom super eight, taxicab and long wheelbase seven-passenger cars and limousines. Presumably all the new body styles will be furnished by Briggs, since the Packard body plant was dismantled during the war and no plans have crystallized for re-equipping it.

Production of General Motors cars and trucks in May, U. S. and Canada, totaled 95,666, or about half of the projected total. Latest tabulation of supplier strikes shows 116 in all, or down 25 from a count made about two weeks ago.

Nash-Kelvinator Plants Reopened

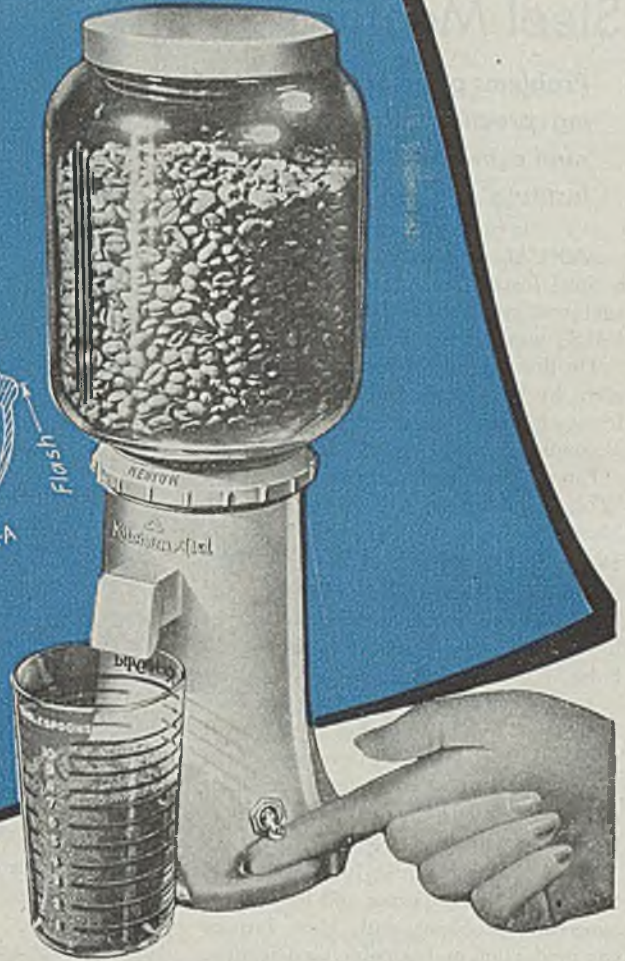
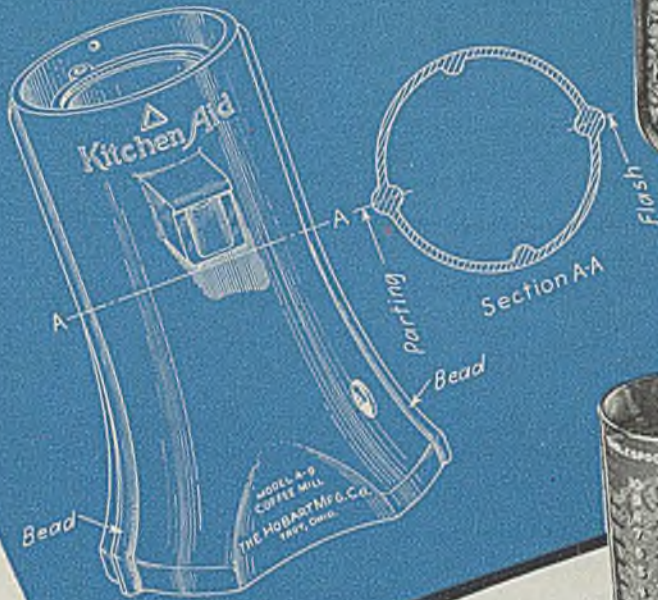
Nash-Kelvinator has reopened its plants in Michigan and Wisconsin, where 16,000 have been idle since May 24. It is presumed that in the meantime inventories of materials and parts have been built up to a point where any further interruption will be some distance off. Car assemblies are scheduled at a rate of around 550 daily, but most if not all of them are still minus bumpers, nameplates and clocks.

Improved synthetic rubber will mean the future development of the 100,000-mile automobile tire, Dr. R. P. Dinsmore, vice president of Goodyear, predicted in a recent discussion here. He said that the major improvements in future tires may not come from natural rubber and that while synthetic rubber is not yet completely the equal of the natural product "it would be a reversal of our whole experience if it did not ultimately become superior."

His optimistic outlook on synthetic rubber is not shared by all rubber technologists, some of whom feel that the problem of heat can never be overcome in the pure synthetic tire, but will require the admixture of 25 per cent or more of natural rubber.

DESIGNING FOR DIE CASTING

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YOUR COPY



TRIMMING

In designing die castings, it is important to remember that flash always occurs on castings at the die partings, and that steps can be taken in design to bring the flash where it can be trimmed most easily and quickly by a shaving die.

Cost of flash removal is minimized when:

1. The die parting can be in a single plane.
2. Slides and movable cores are not required in the die.
3. Cores do not join or intersect in forming the casting.
4. Blind holes rather than through holes are employed.
5. Contours of the casting at the parting are of simple shape.
6. Flash occurs at points where other machining is required, in which case a separate flash removal operation is avoided.

Flash which runs along a flat surface, and is not at the extreme edge of the casting, is difficult to remove cleanly without leaving tool marks on adjacent surfaces.

The designers of the above zinc alloy die cast coffee mill housing avoided this problem by merely employing decorative beads on either side of the casting at the parting line. Thus the flash occurs on the beads, from which it is easily shaved off without marking the surrounding areas.

Additional data on trimming and other design considerations appear in our booklet "Designing For Die Casting." To insure that you will get the most from your die casting dollar, ask us—or your die casting source—for a free copy of this booklet.



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**

Several Papers Read at British Steel Meeting

Problems peculiar to steelmaking practice discussed at annual convention of Iron & Steel Institute

ANNUAL meeting of the British Iron & Steel Institute was held in London recently at which time Dr. C. H. Desch, F.R.S., was elected president.

The first Hatfield Memorial Lecture was given by Dr. George B. Waterhouse, professor emeritus, Massachusetts Institute of Technology.

Papers read and discussed included "The Detection of Cracks in Steel by Means of Supersonic Waves" by C. H. Desch, D. O. Sproule and W. J. Dawson.

"Fuel Problems in the Swedish Iron and Steel Industry" were discussed in a paper by Dr. Magnus Tigerschiold of Stockholm.

A paper entitled "Problems in Fuel Efficiency" by C. Hulse and R. J. Sarjant dealt with fuel selection, developments in furnace design and construction, methods of fuel saving in individual works, education and research.

"Fuel Utilization in Iron and Steel Works" by N. H. Turner and F. A. Gray concerned problems with blast furnace gas production and possible modifications in blast furnace practice. The application of by-product gases and the question of heat conservation were also considered.

A discussion took place on the overheating of steel based on the following papers: (1) "Some Aspects of the Overheating of Steel Drop-Forgings," by H. J. Merchant, (2) "The Overheating and Burning of Steels," by A. Preece, A. Hartley, S. E. Mayer and J. Nutting, (3) "Overheating and Burning of Nickel-Chromium-Molybdenum Steel," by W. E. Goodrich, (4) "The Effect of Oxygen on the Isothermal Transformations of Steel, and a Suggested Test for Burning," by F. C. Thompson and L. R. Stanton and (5) "Some Experiments on Overheating," by J. Wolman and H. W. Kirby. These papers described the principal causes and factors influencing overheating and an attempt was made to differentiate between overheated steel, severely overheated steel and burnt steel. Methods of prevention were described, and in Mr. Merchant's paper there were some notes on the occurrence of overheating in American steels. Suggestions were given regarding directions which might be taken for future research.



ENAMELERS MEET: Principles of OPA industrial price regulation and the critical enameling sheet supply situation were principal topics of discussion of these members of the Porcelain Enamel Institute, shown at a recent luncheon meeting at the Hotel Statler in Washington

New Orders for Industrial Furnaces, Ovens Decline but Still Exceed Output

WHILE new orders for industrial furnaces and ovens are declining, backlogs nevertheless are increasing as buying still runs in excess of production, which is handicapped by inability of manufacturers to get materials.

This was brought out at the sixteenth annual meeting of the Industrial Furnace Manufacturers Association, June 6-8, at the Homestead, Hot Springs, Va., attended by representatives of more than 25 leading makers of this equipment. The present downward tendency in new orders is expected to give way to an upward trend as soon as conditions, particularly the labor situation, become more stabilized, so that buyers can go ahead with greater confidence with their postwar programs.

All officers were re-elected, C. F. Olmstead, Lee Wilson Engineering Co., Cleveland, again being named president; S. N. Clarkson, New York, executive vice president; and R. W. Porter, Swindell-Dressler Corp., Pittsburgh, treasurer.

R. T. Cadwell, Holcroft Co., Pittsburgh; Horace Drever, Drever Co., Philadelphia; and William Adam Jr., Ajax Electric Co., Philadelphia, were elected to the board of directors, to succeed three members whose terms were expiring.

As a step in the further development of the postwar program that would best serve the industrial furnace and oven manufacturers, a research committee was appointed, headed by C. B. Keltner Jr., W. S. Rockwell Co., New York. The

new committee will make a survey to ascertain in what lines of research members are primarily interested. Meanwhile, at least, it was made known that the board would sanction research on the part of any group of the membership, provided all were invited to participate. It was admitted that there would be phases of research that some members would be more interested in pursuing than others.

Also appointed was the committee on public relations, headed by C. H. Stevenson, Lindberg Engineering Co., Chicago. One objective of the new committee is to conduct a contest among users of industrial furnaces and ovens, with prizes to be awarded, for best suggestions for improvement and application of this equipment.

Surplus government furnaces and ovens do not in themselves hang heavily over the market for new equipment, for the reason that the equipment now up for disposal was designed principally for specific operations, and hence do not lend themselves readily to new applications. However, C. Reynders and M. H. Carpenter, War Assets Administration, Washington, who discussed this problem, said that the equipment on hand provided good opportunities for the salvaging of motors, controls, conveyors and various parts and components.

Repair parts can be made into a more profitable business, in the opinion of C. H. Vaughan, Electric Furnace Co., Salem, O., who believed manufacturers

should promote the idea among customers of maintaining adequate stocks of replacement parts so as to help assure continuity of operations.

Brig. Gen. Donald Armstrong, U. S. A., chief, Industrial College of Armed Services, suggested that the association appoint a committee to meet with army officers to review relations with the Army so as to be in position to correct any mistakes of omission or commission that may have developed during World War II, should a similar emergency ever again arise.

He thought personally that perhaps the greatest deterrent to another war would be the knowledge among potential enemies that this country was prepared for instant mobilization. He pointed out that during the recent war it required almost two and one-half years for this country to become fully mobilized. The next time, should it ever come, that will be too long by far, he declared.

MEETINGS

June 17, American Society of Mechanical Engineers: Machine design group meeting, Hotel Statler, Detroit. C. E. Davies, 29 West 39th St., New York 18, secretary.

June 17-18, American By-Products Coke Institute: First annual meeting, Seaview Country Club, Absecon, N. J. Samuel Weiss, 729 15th St. N. W., Washington 5, executive secretary.

June 17-20, American Electroplaters Society: Annual convention, Hotel William Penn, Pittsburgh. Society headquarters are at 93 Oak Grove Ave., Springfield, Mass.

June 17-20, American Society of Mechanical Engineers: Semiannual meeting, Hotel Statler, Detroit. C. E. Davies, 29 West 39th St., New York 18, secretary.

June 21-22, American Society of Mechanical Engineers: Applied Mechanics Division meeting, Buffalo. Association headquarters are at 29 West 39th St., New York 18.

June 24-28, American Institute of Electrical Engineers: Summer convention, Hotel Statler, Detroit. H. H. Henline, 33 West 39th St., New York 18, secretary.

June 24-28, American Society for Testing Materials: Annual meeting and exhibit of testing apparatus, Hotel Statler, Buffalo. C. L. Warwick, 260 S. Broad St., Philadelphia 2, secretary.

June 25-26, National Warm Air Heating & Air Conditioning Association: Midyear convention. Edgewater Beach Hotel, Chicago. George Boeddener, 145 Public Square, Cleveland 14, managing director.

July 1, Great Lakes Regional Advisory Board: Executive and Railroad Contact committees meeting, Hotel Statler, Detroit. John A. Jacobson, A5 M. C. Terminal, Detroit, general secretary.

July 17-20, American Society of Civil Engineers: Convention, Davenport Hotel, Spokane, Wash. Association headquarters are at 33 West 39th St., New York 18.

Aug. 22-24, Society of Automotive Engineers: National West Coast transportation and maintenance meeting, New Washington Hotel, Seattle. John A. C. Warner, 29 West 39th St., New York 18, secretary and general manager.

June 17, 1946

BRIEFS

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

Western Electric Co. Inc., New York, has leased the Curtiss-Wright Corp. plant at Kenmore, N. Y., and will use the facility to make switch-board cable and other telephonic equipment.

Timm Industries Inc., Los Angeles, subsidiary of Timm Aircraft Corp., has been awarded a contract by Doehler Metal Furniture Mfg. Co., New York, for 16,550 units of aluminum furniture.

Heil Co., Milwaukee, road machinery, bottle washers and tank builder, has plans to add two wings to its Milwaukee plant at a cost of \$500,000.

Akron Brass Mfg. Co., Wooster, O., has purchased the assets and patent rights of Fog Nozzle Co., Los Angeles, and will operate it as Fog Nozzle International Inc.

Dow Chemical Co., Midland, Mich., has published two technical booklets on its two new coating materials, Saran F-120, a solvent soluble resin, and Saran F-122, a latex forming a continuous film upon air drying.

Crucible Steel Co. of America, New York, has moved its San Francisco office and warehouse to 2050 Bryant St., San Francisco 10.

Denison Engineering Co., Columbus, O., has appointed Bryant Machinery & Engineering Co., Chicago, and Wm. K. Stamets Co., Pittsburgh, as exclusive distributors of hydraulic presses for the Chicago district and Pennsylvania, Ohio, Maryland and West Virginia, respectively.

W. F. Hebard & Co. and W. F. Hebard Equipment Co., industrial tractor manufacturers, have moved from 2435 South State St., Chicago, to 336 West 37th St., Chicago 9.

Blaw-Knox Co., Pittsburgh, has acquired the assets and business of Buflovak Northwest Co., Minneapolis, food processor equipment manufacturer, and will operate it as a subsidiary under the name of Buflovak Midwest Co.

Economy Pumps Inc., Hamilton, O., has purchased Klipfel Mfg. Co., Chicago, manufacturer of pressure regulators and other fluid flow equipment.

Hooker-Detrex Corp., Tacoma, Wash.,

jointly owned by Hooker Electrochemical Co., Niagara Falls, N. Y., and Detrex Corp., Detroit, has been incorporated and will manufacture chlorinated solvents as soon as its plant in Tacoma is completed.

M. A. Hanna Co., Cleveland, has transferred all the coal mining properties of Hanna Coal Co. in Ohio to Pittsburgh Consolidation Coal Co., Pittsburgh. Operation of the mines will continue under the name of Hanna Coal Co.

Ellinwood Industries Inc., Huntington, W. Va., has been formed to produce garden tractors under a license agreement with Ellinwood Industries, Los Angeles. Officers of the company are: R. S. Ellinwood, president; A. Grant Beckett, vice president; and Harry Scherer, secretary-treasurer.

Lobdell Co., Wilmington, Del., steel fabricator and machine tool builder, has been acquired by Walter H. Lippincott, Conshohocken, Pa.

Chambersburg Engineering Co., Chambersburg, Pa., has appointed Frank G. Shaub, 14456 Scripps Ave., Detroit, as representative for that area.

Air Reduction Co. Inc. and U. S. Industrial Chemicals Inc., New York, have completed plans for a chemical research laboratory to be built in Stamford, Conn. The research staffs of both companies will share common facilities.

New Line of Equipment To Be Made by Pettibone Mulliken

Pettibone Mulliken Corp., Chicago, has contracted with the Wooldridge Mfg. Co., Sunnysdale, Calif., to manufacture the complete line of Wooldridge earthmoving equipment.

This will utilize fully the Pettibone Mulliken facilities and equipment formerly used in war production but will make it necessary for the company to invest substantial sums in improvements and alterations to buildings and equipment.

Detroit Steel Casting Co. Acquired by Barium Steel

Barium Steel Corp., Canton, O., has acquired control of Detroit Steel Casting Co., Detroit, producer of carbon and alloy steel castings.

Employment Tide Continues Rise In California

*Postwar peak of 3,330,000 now expected by mid-July
Further gains over remainder of year hinge on raw material*

SAN FRANCISCO

CIVILIAN employment in California is expected to reach a postwar peak of 3,330,000 by mid-July. Compared with the low point reached last February, that will amount to a gain of approximately 190,000.

At the same time, despite continued influx of returning veterans and out-of-staters who are moving to the West Coast in large numbers, unemployment totals are declining. Unemployment reached a postwar peak in March at a figure between 475,000 to 525,000. By the end of April the number had dropped to between 450,000 and 500,000. It is believed there has been a further reduction since.

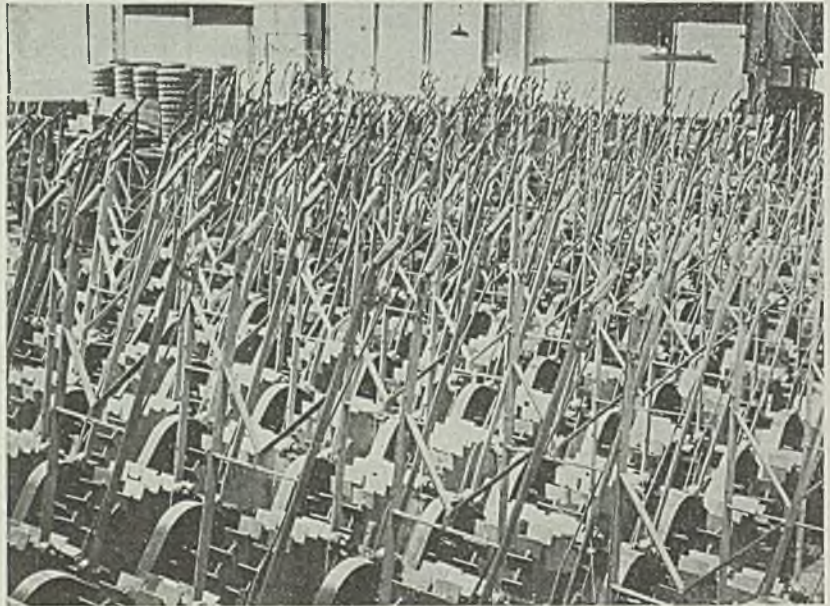
According to the California Reconstruction & Employment Commission, which compiled the data on employment, the mid-summer gains in the working force partly will come through seasonal increases in agricultural activities and partly through expected expansion in trade, services, manufacturing and construction. The commission also reported unemployment insurance claims by non-veterans in California reached an estimated peak of 274,000 in February and then declined steadily to 194,000 by the end of May.

Probably the greatest factor in determining whether employment will continue to rise during the next few months is an adequate supply of raw materials. With few exceptions, most manufacturers along the West Coast still claim materials shortages are the biggest bottlenecks to normal production. This is especially true of the metal fabricating industries, which have been set back severely and consecutively by the steel strike, the coal strike and the rail walkout.

Until materials are available in sufficient quantity to add extra shift operations, it is unlikely that employment will remain below normal expectancy.

To Determine Bargaining Agent for Geneva Steel

The official bargaining agent for employees of the Geneva steel mill in Utah



ENGINE-LESS TRACTORS. When engine shortages became serious, Ellinwood Industries, Los Angeles, faced the decision of holding up production or building engine-less garden tractors. They decided on the latter, so now, as engines arrive they are installed in 10 minutes and immediately shipped. Production has increased tremendously, despite material shortages

was scheduled to be determined at a run-off election made necessary when all of the three labor unions involved failed to poll the necessary 51 per cent of the votes cast in the previous election.

At the regular election, results showed that the CIO came nearest to polling the necessary majority by receiving 245 of the 504 votes cast. This was seven votes short of a majority.

The American Federation of Labor, the present bargaining agent, received 154 votes, and the International Association of Machinists, an independent union, received 98 votes. Of the remainder, four ballots were marked for no union and three ballots were voided. A total of 592 production and maintenance workers were certified to vote in the election.

In the run-off election, the fight will be solely between the C.I.O. and A.F.L. unions as the machinists union was eliminated as a contender.

Kaiser To Start Aluminum Production at Mead Works

Kaiser Co. engineers report they expect one potline of the Mead aluminum reduction plant will be ready for operation by the middle of July.

This resumption, followed by operation of Mead's five other potlines, will speed resumption of operations at the Trentwood rolling mill, also leased by Kaiser. Each potline has a productive

capacity of 3 million pounds monthly.

The work of reconditioning the potlines is being done by General Machinery Co. which has a crew of 75 men working at the plant.

Nail Mill Reported Being Planned for Los Angeles

Louis M. Dreves, regional director of the Civilian Production Administration, said last week in Los Angeles that a nail mill is planned for that area. He declined to name the planners.

"Preliminary outlines have been drafted for a nail mill in this area," Mr. Dreves declared. "One plant has agreed to convert from war production to nails. Nail making machinery is obtainable in the East. Now conferences are being held with steel executives for the necessary supply of wire for the sizes of nails most needed."

These sizes, he said, include the 8, 16 and 20 common, and common box. At present the state's only nail mill is at Pittsburg, Calif.

Rolling Mill Projected For Pacific Northwest

SEATTLE

Frank V. Seidelhuber Jr., vice president, Seidelhuber Iron & Bronze Works, 1421 Dearborn Street, recently announced a survey is being made and sketches prepared by Freyn Engineering Co., Chi-

cago, and Engineering Associates, Seattle, for a \$3 million rolling mill to be located here if the project is approved.

The proposed plant will include three steel frame structures, corrugated iron sides, 200 feet in width and 1100, 800 and 500 feet long respectively. Oil fired furnaces will be installed. Five 25-ton cranes are included in the proposed equipment. Present plans involve production of reinforcing bars, angles, eye beams, flats, rounds and squares and black, galvanized, pickled and corrugated sheets.

"Only two eastern mills are shipping sheet steel to the Pacific Coast," said Mr. Seidelhuber, "and their deliveries fall far short of our demands here. We need sheet steel for hot water heaters, refrigeration units, cooking ranges and corrugated siding."

Atomic Energy Propulsion Of Automobiles Discounted

Dr. Glenn T. Seaborg, physics professor, University of California, and co-discoverer of plutonium, last week in Los Angeles ventured the prophecy that:

"We can say definitely atomic energy based upon the fission principle will never be a useful source of energy for the propulsion of ordinary machinery including the automobile."

Instead, he saw possibilities in the generation of heat and light and power for "isolated American communities, propulsion of seagoing vessels and giant aircraft" as among future functions of the energy of the atom when unleashed for peace.

"Under conditions where huge bulks can be tolerated," Dr. Seaborg said, "stationary power plants in which the energy is removed by water or air, might be used for space heating. Or the reaction might make steam for use in turbines."

On a cost basis, he continued, uranium's tremendous power-per-pound places this element on a competitive basis with bituminous coal or petroleum fuels.

"One pound of U-235 (uranium)," he declared, "is equivalent to 11,400,000 kilowatt hours of energy, which in turn equals 1500 tons of coal or 200,000 gallons of gasoline. And we may place a price of about \$1400 on a pound of U-235."

In every consideration of atomic power uses, he said, the sizes of the operating fission "factory" must be taken into account.

This high "energy pile," he pointed out, needs be shielded by "steel many feet in thickness" to protect workers from deadly radio-active effects.

Dr. Seaborg gave his lecture at the annual Morgan memorial on the Los Angeles campus of the university.

Swelling Population Complicates California Industry Reconversion

Unremitting flood of immigrants puts strain on all existing facilities. Manufacturers of fabricated metal articles face high local demand while labor supply pinch serves as brake on expanded production

LOS ANGELES

SOUTHERN California's rapidly swelling population is the key to most of her industrial problems, according to a survey by the Metal Trades Manufacturers Association.

With throngs of immigrants forming an unremitting flood across the state line at principal border stations, facilities of virtually all kinds are being strained to limits above normal capacities.

For example the population of Los Angeles county now stands at 3,542,809, according to figures released by the County Regional Planning Commission.

This estimate includes a prediction that by July the population of Los Angeles will have risen to 1,806,280. Comparatively, in April, 1940, the total county population was 2,785,684 while that of the city was 1,504,277.

"Over and above the exigencies im-

posed by federal regulations, unprecedented demand for goods, lack of production facilities needed in a burgeoning civilian economy and other factors, manufacturers and fabricators of metal articles face a continuous pressure merely from the increase in population with a region equipped to accommodate hundreds of thousands fewer individuals than at present inhabit it," the MTMA report stated.

"Despite recent price relaxations by OPA the producer of fabricated articles still faces high local demand and a very low supply of labor, which, it is expected, will remain more or less a brake on industry until a higher level is slowly arrived at, when worker production in a measure shall have balanced public demand."

The worker production will not reach normal expectancies until the mass of newcomers shall have acquired homes and other possessions requiring steady jobs to maintain, it was pointed out.

Meanwhile, operating spreads should expand, the report predicts, since the larger volume in prospect promises to reduce unit costs and expenses, despite higher wage rates which in many cases already are here and in others are sure to come.

Texas-to-Los Angeles Gas Pipeline Authorized

The Federal Power Commission has authorized construction of a \$70 million pipeline for bringing natural gas from Texas to the Los Angeles area. The 1200-mile line will bring gas sufficient for the needs of about 3,500,000 persons in the area now served by conduits coming in from the Kettleman Hills section of Kern county.

The authorization was given the Southern California Gas Co. and the Southern Counties Gas Co. of California.

Plans for first gas deliveries at the California-Arizona border by June 1, 1947, and continuing for 30 years are announced in the authorization. Maximum contracted volumes are 125 million cubic feet daily the first year, 175 million cubic feet daily for the next three years, and 305 million cubic feet daily for succeeding years.

JOB GO BEGGING

Indicative of the attitude toward jobs of the run-of-mine southern California worker were records disclosed to a STEEL reporter last week at the offices of the State Department of Employment in Los Angeles.

At these offices, thousands of jobless mill about daily seeking unemployment compensation checks. The average, it was reported, is about 130,000 a week. These apply to the 25 offices in Los Angeles county maintained by the state to dole out the benefit payments.

To one office came labor solicitors from the Farm Placement Office seeking workers by the hundreds to pick southern California's oranges now threatened with overripeness on account of hot weather. During all of last week, only 14 men signed at this office to pick the oranges.

Meanwhile, without exception, every industry in the area suffers from lack of workers to man jobs being offered through every known medium of advertising.

MEN of industry

J. F. Weller has been appointed to the newly created post of sales assistant to the president, American Brake Shoe Co., New York. Since 1943, he had been director of automotive sales for the company's Kellogg Division and American Brakeblok Division.

William C. Schulte has been appointed quality manager, Propeller Division, Caldwell, N. J., Curtiss-Wright Corp. Mr. Schulte joined the division four years ago as a metallurgical engineer and was subsequently appointed chief metallurgist.

I. C. Ebeling has been appointed Detroit district manager, Geary Stainless Steel Co., Baltimore. Mr. Ebeling will have headquarters in Detroit. He was formerly with Ford Motor Co., Dearborn, Mich.

Chester P. Ford has been named divisional manager, midwestern area, Penflex Sales Co., sales organization of Pennsylvania Flexible Metallic Tubing Co., Philadelphia. He will have headquarters in Chicago.

Mark R. Woodward has been appointed director, and Leon D. Holden assistant director, of the new Cement, Lime & Allied Products Division, Vulcan Iron Works, Wilkes-Barre, Pa. Mr. Woodward has returned after four years war service as chief engineer, Plum Brook Ordnance Works, Sandusky, O., where he was manager, engineering,

maintenance and power departments. Mr. Holden was for 18 years a design engineer, Lehigh Portland Cement Co., Allentown, Pa.

J. T. Vollbrecht has been elected a director, Penn Industrial Instrument Corp., Philadelphia. Mr. Vollbrecht is president, Energy Control Co. Inc., Philadelphia.

A. C. Curran has been named general purchasing agent, American Chain & Cable Co. Inc., Bridgeport, Conn., and associate companies. Mr. Curran had been with the company since 1914, and had been assistant general purchasing agent for several years.

Dr. R. M. Reichl has been promoted to vice president, Hydropress Inc., New York.

Alfred B. Drastrup has been appointed manager, alloy steel sales department, A. M. Byers Co., Pittsburgh. Mr. Drastrup has been associated with the company since 1931, in accounting, industrial engineering and plant management capacities.

John W. Anderson has been appointed manager, Oklahoma City, Okla., sales district, Ceco Steel Products Corp., Chicago. He replaces R. K. Alexander, who has been placed in charge of the corporation's sales office and warehouse in Houston, Tex. Mr. Anderson, who joined the Ceco organization in 1938,

was assistant manager, Birmingham office. George Hajek has been appointed manager of the corporation's Dallas, Tex., sales district, replacing J. C. Boyce. Mr. Hajek has been with the Ceco corporation since 1926. He was a sales engineer for the last 12 years.

H. V. Rathbun, recently released from the Army, has returned to the Glassport, Pa., Division, Copperweld Steel Co. He will report to the company's Chicago office. Prior to the war, Mr. Rathbun covered the Kansas City territory for Copperweld.

Howard S. Bowen has been appointed sales engineer, Chicago district, Industrial Division, Aluminum Industries Inc., Cincinnati. Mr. Bowen, recently released from the Navy, will have his headquarters in Chicago.

Richard C. Murphy has been appointed representative covering hardware and mill supply distributors in Ohio and eastern Kentucky, Cushman & Denison Mfg. Co., New York. Irving S. Kemp has been named to represent the company in 11 north central states.

C. H. Strasser has been appointed works manager, electric furnace plant, Chippawa, Ont., Norton Co., Worcester, Mass.

Ronald J. Farrell, sales engineer, has been appointed a representative of Bunell Machine & Tool Co., Cleveland. He will serve in a technical capacity under R. J. Swing, general sales manager. Mr. Farrell is a member of American Society of Tool Engineers.

Merrold S. Johnson has been named manager, Advertising and Sales Promotion Division, Edison General Electric Appliance Co. Inc., Chicago. He was with Arnold Schwinn & Co., Chicago.

F. P. Leahey has been named manager, Battle Creek, Mich., wire mill, Nichols Wire & Steel Co., Davenport, Iowa. Mr. Leahey had been associated with Spencer Wire Co., West Brookfield, Mass.

Edward M. Douglas has been promoted to vice president, International Business Machines Corp., New York. Mr. Douglas was executive assistant of the corporation. He joined IBM in 1925.

George C. Tolton has been appointed sales representative for the northwestern states, American Foundry Equipment Co., Mishawaka, Ind. He will have



LEON D. HOLDEN



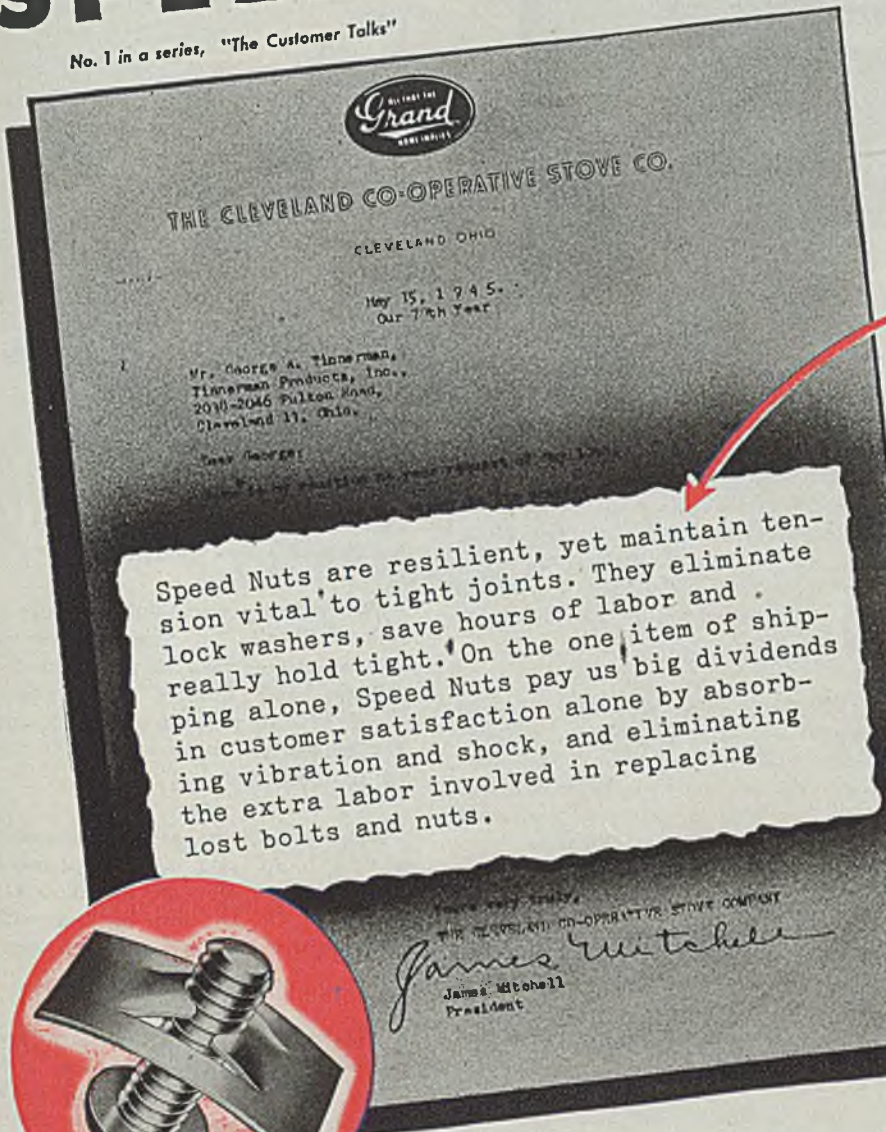
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Speed Nuts are resilient, yet maintain tension vital to tight joints. They eliminate lock washers, save hours of labor and really hold tight. On the one item of shipping alone, Speed Nuts pay us big dividends in customer satisfaction alone by absorbing vibration and shock, and eliminating the extra labor involved in replacing lost bolts and nuts.

James Mitchell
James Mitchell
President

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Prevent vibration loosening

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Eliminate lock washers

Eliminate handling of material

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Perform multiple functions

Will not "clog" or "freeze"

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Weigh less

Stove manufacturers face difficult assembly problems. The severe vibration and shock that stoves are subject to during transportation to the ultimate consumer must be met. Allowance must also be made for expansion and contraction of porcelain enamel parts when the stove is heated up to 500 degrees. The Cleveland Cooperative Stove Company select-

ed Speed Nuts to solve their fastening problems, for Speed Nuts provide a spring tension lock that holds tight under severe vibration and yet is sufficiently resilient to prevent damage to porcelain enamel surfaces. In addition, Speed Nuts eliminate lock washers, reduce assembly time and weigh less.

Speed Nuts will pay you big dividends, too. In writing for samples, please give complete assembly details, as Speed Nuts are made in more than 3000 shapes and sizes.

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FASTEST THING IN FASTENINGS

his office in Seattle. For several years Mr. Tolton has been engaged in engineering work in the Seattle area. His last association was with the Bureau of Yards & Docks, 13th Naval District. Anthony Stimmler has been named to represent the American Foundry Equipment Co. in the new Minneapolis sales office. Mitchell R. Christensen has been appointed sales representative in the company's newly created Denver territory, and will have headquarters in that city. Mr. Stimmler was a sales engineer, Mechanical Division, General Mills Inc., Minneapolis. Mr. Christensen served during the war as principal metallurgist and assistant chief of production in a branch of Chicago Ordnance District.

B. C. O'Brien has been elected president and general manager, Bury Compressor Co., Erie, Pa. Prior to joining the Bury company, Mr. O'Brien was vice president and sales manager, Roots-Connersville Blower Corp., Connersville, Ind.

Walter F. Cahill has been elected to the board of directors, Lincoln Park Industries, Lincoln Park, Mich. Mr. Cahill heads Walter F. Cahill Co., manufacturers' representatives handling sales of Lincoln Park products in Michigan.

Paul L. Hexter, vice president, Arco Co., Cleveland, has been awarded an Army Commendation Medal for outstanding service in connection with the development of anti-searchlight camouflage.

A. Amdisen, secretary, Atlas Imperial Diesel Engine Co., Oakland, Calif., has been elected secretary-treasurer of the company. G. S. Anderegg has been named controller.

L. B. Neumiller, president, Caterpillar Tractor Co., Peoria, Ill., has been awarded the annual honorary membership, Alpha of Illinois chapter, Beta Gamma Sigma, national scholastic fraternity, for distinguished service in the field of commerce and industry.

Several changes have been announced in the Automotive, Aviation and Government Sales Divisions, B. F. Goodrich Co., Akron. William G. Zink has been named assistant manager, Los Angeles district. He was previously in charge of the company's Dallas district, where Euell E. Bost succeeds him, with Texas, Mississippi and Louisiana as his territory. J. Ellis Huffman has been placed in charge of a new district established at Tulsa, Okla., covering Oklahoma and



WALTER P. BERG

Arkansas, as well as certain counties in South Dakota, Illinois and Iowa. James N. Davis has been assigned to the company's Cleveland office as an additional automotive and aeronautical representative, and William R. Blake, formerly in the Washington office, has been given the same assignment in the San Francisco district.

Walter P. Berg has been appointed general manager, Machinery Division, Dravo Corp., Pittsburgh. Mr. Berg joined the corporation in 1923, and since 1938 has been in charge of the power department, Machinery Division.

Charles Harrison has been named division manager, western Michigan territory, with headquarters in Lansing, Mich., Aro Equipment Corp., Bryan, O. He had been assistant in the corporation's Detroit and Michigan territory, under Charles Kocsis.

Lew C. Davies has been appointed representative, Chicago territory, Hill Acme Co., Cleveland. His office is in Chicago. For the last twenty-five years, Mr. Davies was superintendent of maintenance, Tool & Die Department, American Forge Division, American Brake Shoe Co., New York.

Dr. David S. Saxon has joined the research staff, Phillips Laboratories Inc., New York, as an associate physicist. He is in charge of the section on theoretical physics. During the war, Dr. Saxon was a member of the theoretical staff, radiation laboratory, Massachusetts Institute of Technology, Boston.

R. N. Landreth, assistant to the vice president, General Machinery Division, Allis-Chalmers Mfg. Co., Milwaukee, has been named to direct the activities of the company's Washington, D. C., district office. Mr. Landreth joined the

company in 1931, becoming assistant to the vice president in 1945, with offices in Washington. Ralph R. Newquist, with the firm since 1934, has resigned as manager of the Washington district office.

Frank O. Jappel has been appointed sales manager, Eclipse Counterbore Co., Detroit. Mr. Jappel has been associated with the company's sales department for the last 11 years.

Reese B. Lloyd has been appointed plant manager, Chicago plant, Rheem Mfg. Co., New York. Before joining the company, he had been associated for 12 years in Birmingham with Republic Steel Corp., Cleveland.

William H. Schwinger has been elected vice president and treasurer, Harold G. Rogers, vice president in charge of sales, and F. Leslie Marsden, director, Irving Air Chute Co. Inc., Buffalo.

Fred Clarke, merchandise manager, Western Electric Co., New York, has retired after more than 40 years with the company and affiliates. Mr. Clarke joined Western Electric in 1923, and was named general merchandise manager in 1939.

Kenneth I. Silvis has been promoted to the snap ring sales department, Eaton Reliance Division, Massillon, O., Eaton Mfg. Co. Mr. Silvis has been with the company's Reliance Division since 1935.

Boyd R. Hopkins has been appointed eastern district manager, Thermex Division, Girdler Corp., Louisville. He will have headquarters in New York. Succeeding Mr. Hopkins in his former position as central district representative for the division is Robert Smith Logan Jr., recently released from the Marine Corps. He will have headquarters in Cleveland.

Virgil M. Graham has been appointed manager of technical relations, Sylvania Electric Products Inc., Ipswich, Mass. He had been manager of the company's industrial apparatus plant, Williamsport, Pa. Mr. Graham joined the Sylvania engineering staff 11 years ago. He is a director, Institute of Radio Engineers.

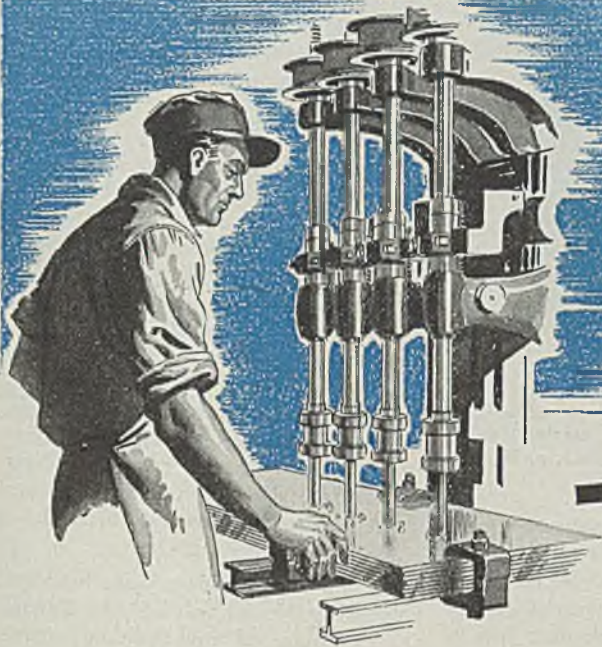
Dr. Sidney M. Cadwell has been appointed director of research and technical development, United States Rubber Co., New York. Dr. Cadwell joined the company in 1919, and has been as-

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Stainless Steel?

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Stack Drilling? What drill feed should be used in drilling $\frac{3}{8}$ -in. holes through clamped stacks of 20-gage, E-S 18-8 Mo stainless (Type 316) sheets?

Bevel Milling? In beveling E-S 18-8 low-carbon stainless (Type 304) plate edges before welding, must we decrease the speed or feed of the milling cutter as the cut widens?

Hole Size for Tapping? What diameter reamer should be used on holes in titanium-bearing E-S 18-8 plate (Type 321) to be tapped for $\frac{1}{4}$ "-32 threads?

Saw Tooth Set? Is any special set required in the teeth of a band saw for cutting light-gage E-S 18-8 stainless sheet (Type 302)?

Punch-Marking? Can we punch-mark drill holes in E-S 18-8 chrome-nickel plate (Type 304)? What is the best way to start holes at an angle with this plate?

Counterboring? Is reaming likely to harden E-S 17-7 Stainless (Type 301) so much that counterboring is difficult? What is the remedy?

Machining stainless, like handling any other important metal, requires the right technique. When you know how, it is simple. When you need help, get in touch with Eastern. Eastern technical men have worked with stainless so much that they have the right advice at their fingertips. There is a lot of good advice, too, in Eastern's booklet, "Eastern Stainless Steel Sheets." A copy is yours for the asking.

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**EASTERN STAINLESS
STEEL CORPORATION
BALTIMORE 3, MARYLAND**



RALPH C. BERG

Who has been appointed production manager, Le Roi Co., Milwaukee, noted in STEEL, May 20 issue, p. 107.



W. J. ADAMSON

Recently appointed general manager of sales, Allegheny Ludlum Steel Corp., Brackenridge, Pa., noted in STEEL, May 27 issue, p. 80.

assistant general manager, Tire Division, since 1945. **Dr. Willis A. Gibbons**, who has been serving in Dr. Cadwell's new position, has been named associate director, and will devote his entire time to scientific research.

Dr. Linus Pauling, director, Gates & Crellin Laboratories of Chemistry, California Institute of Technology, Pasadena, Calif., has been awarded the Willard Gibbs Medal of the Chicago section, American Chemical Society.

Wilbur C. Thompson, recently released from the Navy, has been appointed general sales manager, Detroit Ball Bearing Co. of Michigan, Detroit, and Detroit Ball Bearing Co. of Ohio, Toledo. He was with the companies before entering the service.

Eugene C. Bauer, recently released from the Army, has returned to the Kensington Steel Co., Chicago, where he is associated with the sales division. While in the Army, he supervised the Ordnance Department's inspection of armored vehicles and artillery materiel produced in the Chicago Ordnance District. He was formerly in the Kensington company's production department.

W. O. Lippman has been elected vice president, Westinghouse Electric Corp., Pittsburgh. He will be responsible for all plant labor relations, and will report to **L. E. Osborne**, a senior operating vice president. Mr. Lippman has been with the corporation since 1917, and was assistant to the president since 1944. **W. G. Marshall**, vice president of the organization, in addition to his administration of companywide industrial relations, has been assigned increased responsibilities for community and public relations. Mr.

Marshall joined the Westinghouse corporation in 1929, as assistant to the vice president. In 1934, he was elected vice president in charge of industrial relations. **Hilbert E. Edwards** has been named section engineer in charge of laundry equipment engineering at the corporation's Electric Appliance Division, Mansfield, O. Mr. Edwards had been in charge of the development and engineering of the Westinghouse automatic washing machine.

Morris Podolsky has been appointed supervisor of warehouse operations, Levinson Steel Co., Pittsburgh. He is succeeded in his former supervisory position in the fabricating department by **Nicholas Pesanka**. **Abc Margolis**, who has returned to the company following his release from the service, has been appointed plant office manager. **Sidney Moidel** has been named office manager, specialty department, Levinson Steel Sales Co. **Benjamin Moss** has joined the company's sales department. He was with Reliance Steel Products Co., McKeesport, Pa. **Jerome Goldman**, returning to the company after service with the armed forces, has been appointed office manager, warehouse department.

George E. Price Jr., purchasing agent, Goodyear Tire & Rubber Co., Akron, was awarded the J. Shipman Gold Medal at the national convention, National Association of Purchasing Agents, held recently in Chicago. Mr. Price, recently released from the Army, is a past president and director of the association, and now serves on various committees.

Robert J. McGreevy, recently released from the Navy, has been appointed assistant district manager of industrial truck sales engineering for the metropolita

New York City area, Philadelphia Division, Philadelphia, Yale & Towne Mfg. Co. He will be associated with **Carl E. Lang**, recently appointed New York district manager of industrial truck sales engineering, with offices in New York. Mr. McGreevy joined the company in 1940 in the Pittsburgh office.

Willard W. Boeswetter, **Carroll A. Pickering**, and **Eugene B. Hauser**, all recently released from the Navy, have joined the field and service force, Hanson-Van Winkle-Munning Co., Matawan, N. J. Mr. Boeswetter has been assigned to the company's main office at Matawan, in electrical sales work. Mr. Pickering has been assigned to the Chicago office as a field engineer. Prior to the war he was an electrochemist with Fairbanks Morse & Co., Chicago. Mr. Hauser has been assigned to the company's New York office. He was a design engineer at the main office from 1940 to 1942.

Six new field engineers have been appointed by Nelson Sales Corp., Lorain, O., distributor of stud welding equipment and studs. **Richard O. Blankmeyer**, with headquarters in Fayetteville, N. Y., will cover the corporation's upstate New York and northern Pennsylvania area. **Kenneth Knotts** will cover western Pennsylvania, southeastern Ohio, western Maryland and West Virginia. He will have headquarters in Pittsburgh. **Leslie E. Bluhm**, Hyattsville, Md., handles the sales corporation's Delaware, eastern Maryland, Washington, D. C., Virginia and North Carolina area. Both headquartered in Detroit, **Al Wrigley** and **Jack Godley** jointly handle the Detroit area. Mr. Wrigley also covers northeastern Michigan and Mr. Godley also covers northwest Ohio and the Ft. Wayne, Ind., territory. **William G. Tawse**, Los Angeles, is field engineer in southern California, the area formerly handled by **M. E. Tougas**.

F. B. Ennis has been appointed manager of manufacturing, Wiring Device Division, Bridgeport, Conn., General Electric Co. Mr. Ennis joined General Electric in 1909, and was most recently superintendent of the wiring device section of the company's Bridgeport works. **J. R. Murray** has been named assistant manager of manufacturing, Wiring Device Division, and superintendent, wiring device section. He was assistant superintendent of the company's wiring device section. **C. A. Devore** has been named manager, Mt. Vernon, N. Y., works. Mr. Devore, who had been general foreman of that works, joined the company in 1934. **H. R. Geiman**, with General Electric since 1931 and former general foreman, Meriden, Conn., works,



DAVID M. SALSURY

Recently named executive vice president, Westinghouse Electric Supply Co., New York, noted in STEEL, June 10 issue, p. 84.



DAVID M. HALLIER

Who has been appointed sales manager, National Tool Co., Cleveland, noted in STEEL, June 10 issue, p. 85.



J. L. KLEIN

Who has been appointed director of research, Jessop Steel Co., Washington, Pa., noted in STEEL, June 10 issue, p. 85.

is now manager of that plant. E. G. Hopkins, who joined the company in 1941, has been appointed manager, Norfolk, Conn., works, where he had served as a foreman. R. L. Priestley, who began his association with the company in 1937, and was most recently a foreman in the Norfolk works, has been named manager, Saugerties, N. Y., works. W. A. Stott, with General Electric since 1913, has been appointed manager, Millerton, N. Y., works, where he had been a foreman. H. B. Turner has been named manager, Lowell, Mass., works, where he was a general foreman. He has been with the company since 1937.

Dr. Foster Dee Snell, president, Foster D. Snell Inc., Brooklyn, N. Y., consulting chemist and engineer, was elected president, American Institute of Chemists, recently at the society's annual meeting in New York. Dr. Snell succeeds

Dr. Gustav Egloff of Universal Oil Products Co., Chicago. Dr. Joseph Mattiello, technical director, Hilo Varnish Corp., Brooklyn, was elected vice president, succeeding Dr. Donald Price, technical director, Oakite Products Inc., New York. Dr. Lloyd Van Doren, patent attorney of New York, was re-elected as secretary of the institute, and Frederick A. Hessel, president, Montclair Research Corp., Montclair N. J., was re-elected treasurer.

Alvah Smith has been named advertising manager, machinery department, R. D. Wood Co., Philadelphia. He has been associated with the company for 20 years.

Clifford W. Sponsel has been appointed general manager, Brooks & Perkins, Detroit. He will be in charge of manufacturing, sales, engineering, employ-

ment, and related functions. Mr. Sponsel was manager of production engineering, Ryan Aeronautical Co., San Diego, Calif.

Arthur D. Schwoppe has joined the staff of Battelle Memorial Institute, Columbus, O., where he will be engaged in research on the engineering properties of materials. Mr. Schwoppe was a metallurgist with Wright Aeronautical Corp., Paterson, N. J. He is a member of American Society for Metals.

Kenneth P. Schory has been appointed to the staff of Product Designers, Chicago. He will be in charge of complete design assignments as an executive designer. Mr. Schory was associated with Grumman Aircraft Engineering Corp., Bethpage, N. Y., and Dohner & Lippincott, New York.

OBITUARIES...

Christian Girl, 74, Cleveland industrialist, died in that city, June 10. In 1907, he founded the Perfection Spring Co., Cleveland, which later became part of the Standard Parts Co. in 1916. Mr. Girl retired from active business in 1929, after merging the C. G. Spring & Bumper Co., which he had organized, with Houdaille-Hershey Corp., Detroit.

William S. McClintic, 69, retired superintendent, Keystone works, Jones & Laughlin Steel Corp., Pittsburgh, died recently. He had been with the corporation since 1908, and Keystone works superintendent since 1918.

Francis E. Ganter, 72, who retired from business two years ago after 47 years with General Electric Co., Schen-

ectady, N. Y., died in Neptune, N. J., June 3. Mr. Ganter was a member of the Edison Pioneers, an association of men who at one time worked with the late inventor, Thomas A. Edison.

Rudolph Louis Suhl, 64, manager, nickel sales department, International Nickel Co. Inc., New York, died at his home in Plainfield, N. J., June 10. Mr. Suhl had been with the company 4 years, and was made manager of the nickel sales department in 1932.

Charles E. McManus, 64, chairman, Crown Cork & Seal Co., Baltimore, died recently in New York Hospital, New York. In 1912 he organized the New Process Cork Co., Brooklyn, N. Y., which was merged in 1927 with the Crown Cork & Seal Co. He was president of

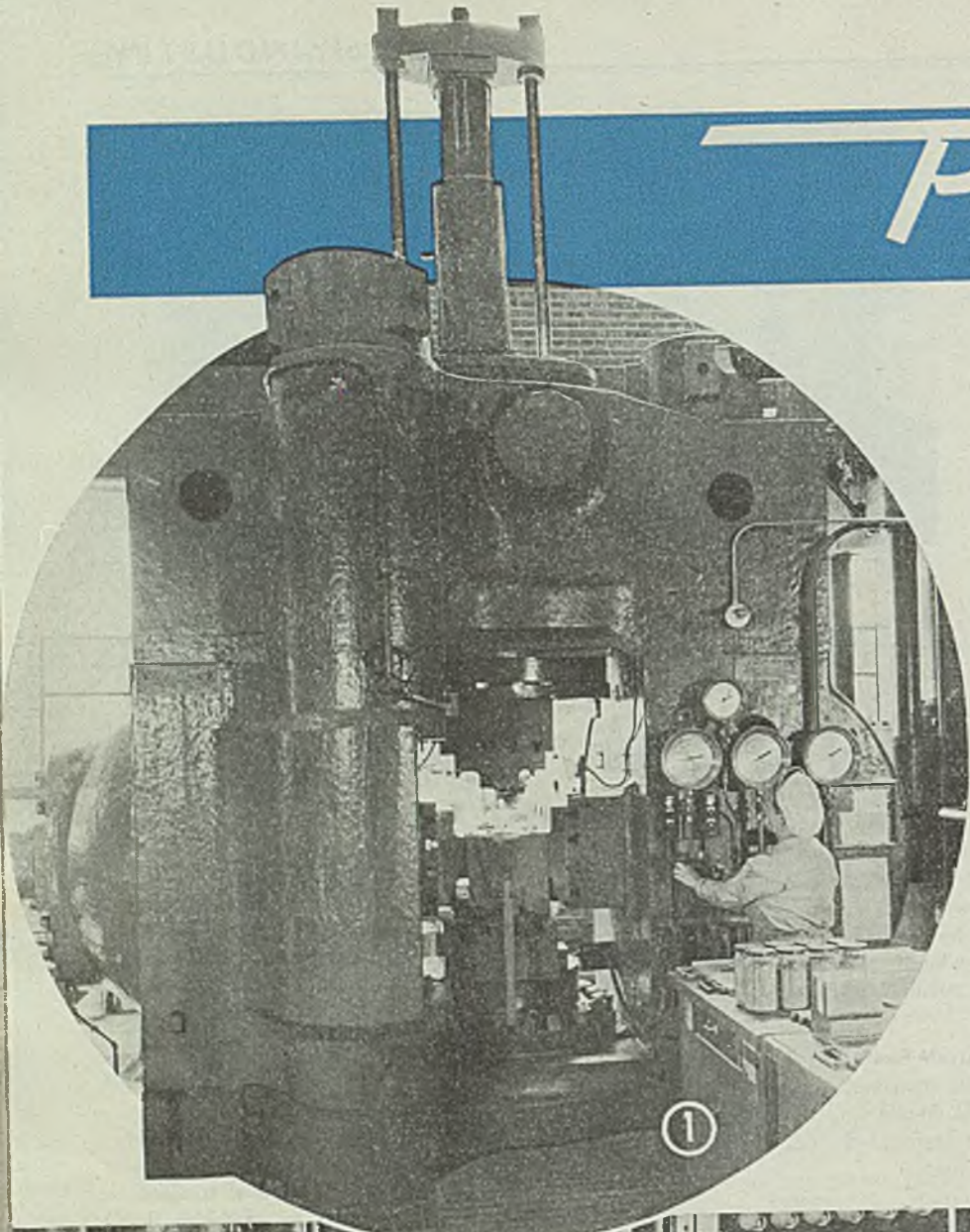
the new company established in Baltimore until last winter when he became chairman of the board.

Michael J. Sweeney, 73, chairman of the board, Allyn-Ryan Foundry Co., Cleveland, died recently at his home in Shaker Heights, O. Mr. Sweeney helped form the Allyn-Ryan company in 1913, and successively became treasurer, president and board chairman.

J. Herbert Ballantine, 79, until his retirement some years ago president and chairman of the board, Neptune Meter Co., New York, died at his home in Great Neck, N. Y., June 6.

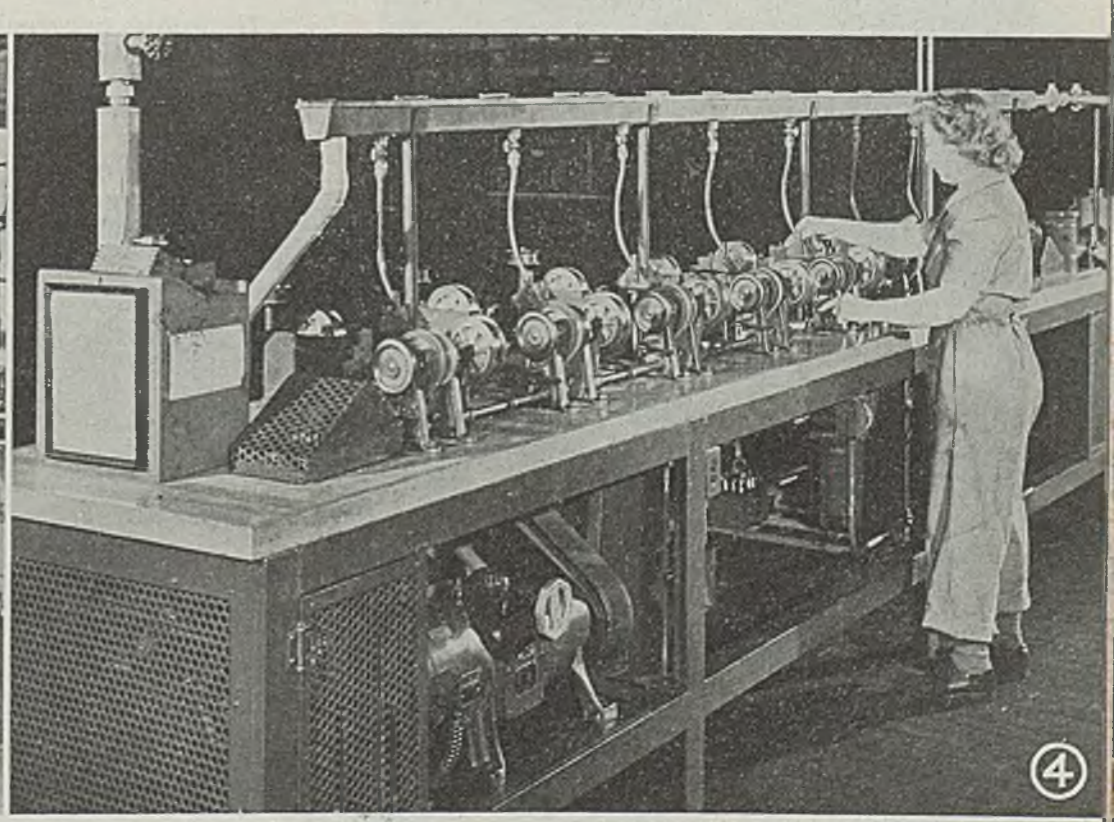
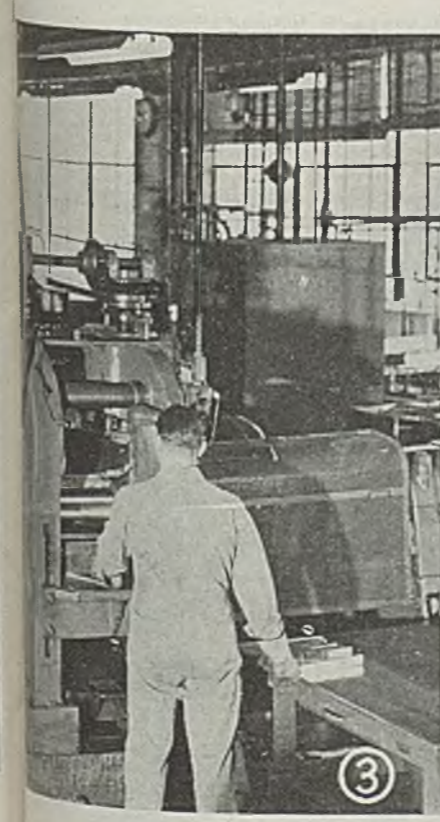
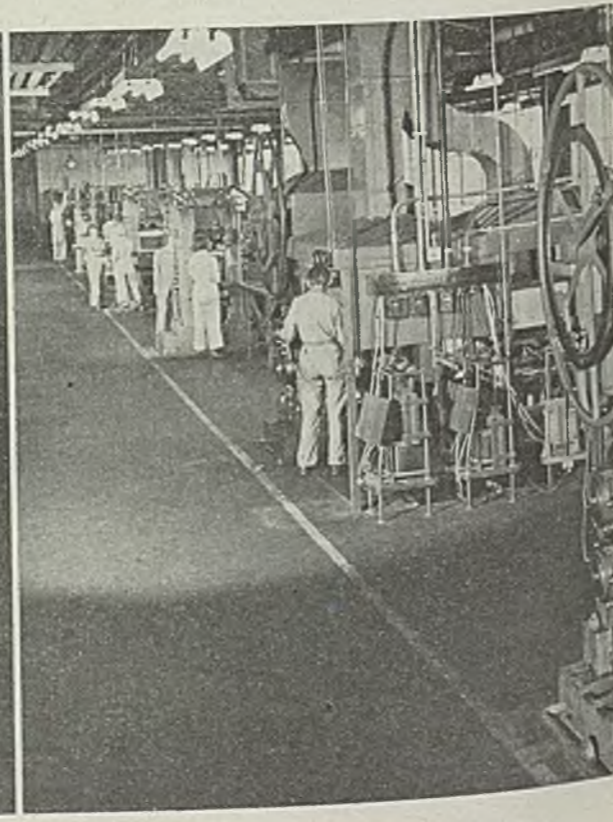
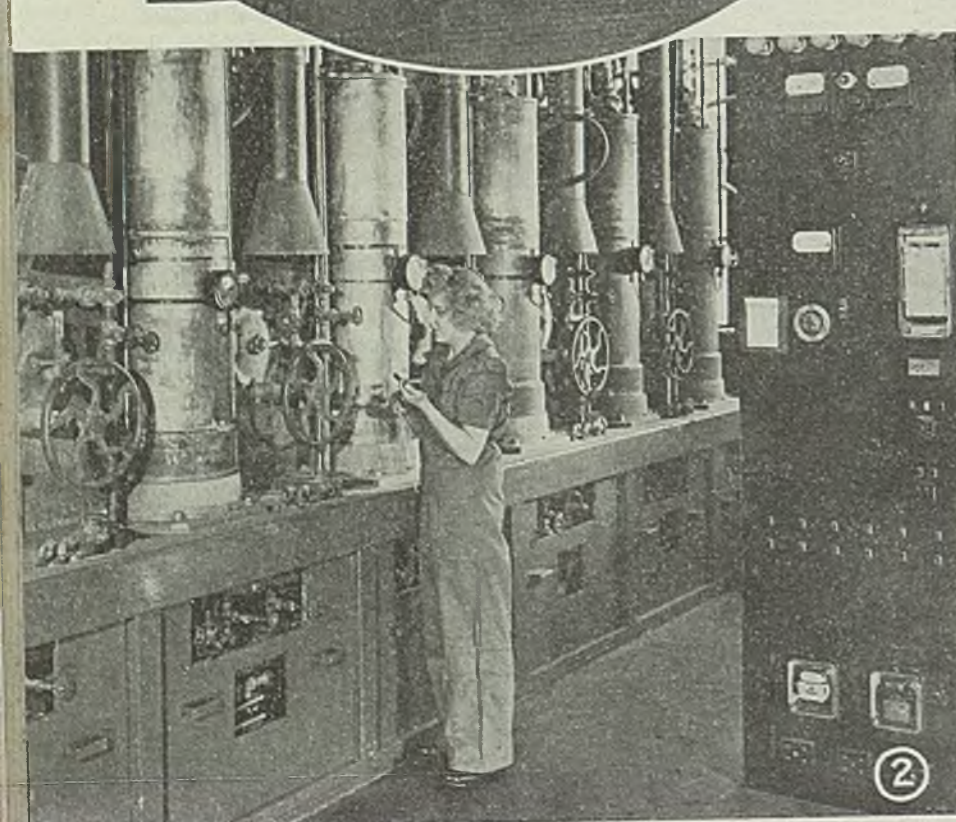
Eric E. Sommer, 34, sales engineer, New Products Division, Linde Air Products Co., New York, died in the LaSalle Hotel fire in Chicago, June 5.

POWDER METALLURGY . . . and the Refractory Metals



Process ideally adapted for manufacture of tungsten, tantalum, molybdenum and columbium in commercial quantities as high melting points make casting of bars or ingots impractical. Physical plant impressive

By ALLAN L. PERCY
Fansteel Metallurgical Corp.
North Chicago, Ill.



IN recent years, much attention has been given to the use of powder metallurgy as an economical means of making steel and nonferrous metal parts by compacting and sintering metal powders, thus minimizing or eliminating machining and finishing operations. (See "Powder-Metal Parts," STEEL, April 16, 1945).

Less publicity has been given to the original use of powder metallurgy in the making of refractory metals whose melting points are so high that the casting of bars or ingots is not practical. It was in this field that the basic principles and the subsequent improvements and refinements in the art of powder metallurgy were discovered and developed.

The problems encountered in obtaining a compact, dense and workable ingot of these metals, having such extremely high melting points and which easily combine with practically all gases at elevated temperatures, still

constitutes one of the most difficult problems encountered in the field of powder metallurgy. Still less light has been thrown on the art of making sintered compositions of mixed metal powders which do not alloy with each other in the common sense of the word.

Tungsten, tantalum, molybdenum and columbium are made by powder metallurgy at the North Chicago plants of Fansteel Metallurgical Corp. and its subsidiary, Tantalum Defense Corp. In the case of each of these metals, powder metallurgy is employed to produce a compact and workable bar which is then converted to useful forms by more or less conventional methods of forging, rolling, swaging and drawing. In some cases, however, finished and semifinished parts are made from the metal powders by compacting and sintering.

During the nineteen-twenties and early thirties, these metals were produced in relatively small lots, with equip-

Fig. 1—Specially designed 3000-ton triple-action hydraulic press for compacting metal powders under pressure to form bars of sizes and shapes that are suitable for further processing

Fig. 2—Hydrogen atmosphere furnaces for sintering tungsten and molybdenum bars compacted from metal powder. Bar itself acts as heating element, conducting a current of several thousand amperes

Fig. 3—Scene in rolling mill department of Tantalum Defense Corp. at North Chicago

Fig. 4—To make tantalum, tungsten or molybdenum wire, sintered bar is swaged to rod of small diameter, then drawn to wire, first through tantalum/tungsten carbide dies and finally through diamond dies, as shown in the operation below

ment little larger than laboratory size, and by methods which depended heavily upon the skill of the operator and close supervision of the laboratory expert. Even before the onset of heavy war demands, increasing quantities of the metals were being made, larger special equipment had been developed and was coming into use, and steps were being taken—some in actual practice and more on paper—to mechanize the rather intricate processes. It can truly be stated that the war did not originate huge developments in the field of these metals; it accelerated developments which had already begun.

All four of these metals are made by a series of chemi-

cal treatments of the ore to produce a metallic salt closely approaching chemical purity, which is then reduced to metal powder. The metallurgy of tungsten and molybdenum is so familiar that only a brief review is needed here. In the Fansteel processes, high grade concentrates of wolframite (iron and manganese tungstates) are pulverized and digested with hot caustic alkali. Repeated crystallizations purify the alkali tungstate, and tungstic acid, H_2WO_4 , is precipitated with hydrochloric acid. The tungstic acid, a bright yellow powder, is washed, filtered, dried and pulverized, and then reduced in pure, dry hydrogen to metal powder.

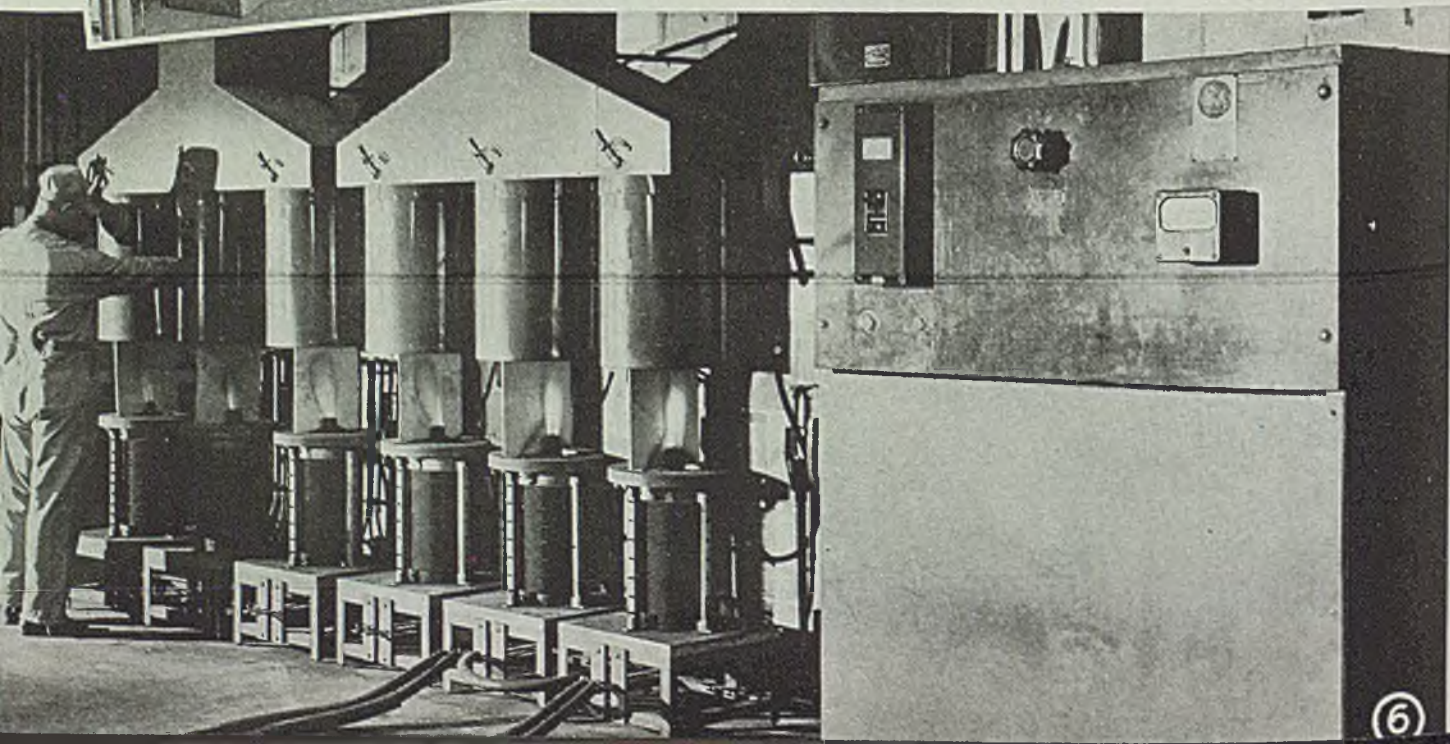
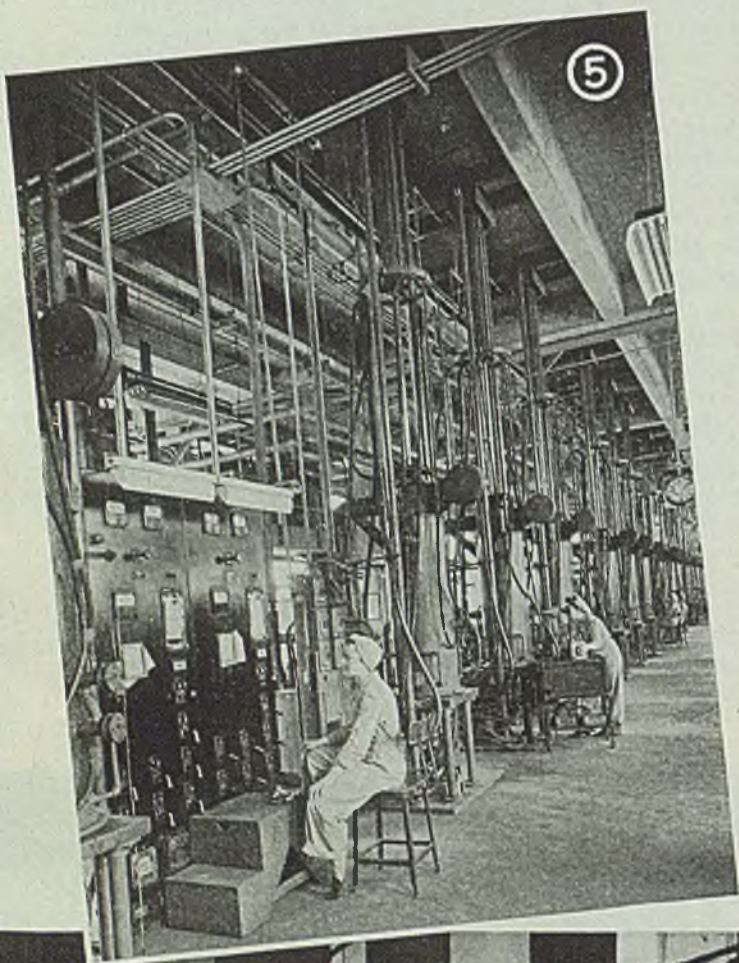
The foregoing processes must be most carefully controlled to produce metal of the desired purity, particle size, and size distribution. It is usually desired to produce tungsten powder of extreme fineness with particle sizes ranging from 0.5 to 6 or 8 microns. When we consider the fact that under certain conditions of temperature, rate of flow of hydrogen, and other factors, powder may be obtained varying from extremely fine dust-like material with particle size below 0.5 micron to grains as coarse as sand, the importance of close controls over the reducing conditions to produce a powder within the above limits of particle size and distribution becomes apparent.

The cold powder is placed in molds or dies of suitable construction and compacted in a hydraulic press into bars of suitable shape and size. Bars intended for rod or wire are square, round or hexagonal in cross section,

(Please turn to Page 146)

Fig. 5—These high vacuum electric furnaces heat bars compacted from tantalum powder to extremely high temperatures, causing powder particles to weld together, forming strong, workable ingots

Fig. 6—High frequency furnaces for forming refractory metal carbide powders by controlled reactions. These powders, blended with each other and with cobalt, are raw materials for cemented carbide tools and dies



PERFORATING PRESS

*... offers unusual accuracy
in feeding mechanism. Preci-
sion dies aid fine operations*

PERFORATING press (Fig. 3) recently built by E. W. Bliss Co. at its Toledo, O. plant has 75 ton capacity and is designed for fine perforating operations requiring precision dies and extreme accuracy in the feeding mechanism. Solid frame design has unusual mass of metal in bed and crown to dampen vibration waves of constant frequency sometimes caused by continuous operation at fast constant speed. Crown has semi-tubular section for rigidity. Slide is very heavy and is guided in precision bronze ways. Connections are of solid steel ball type with adjustable ball seat constantly submerged in oil. Slide and connections are fully counterbalanced by heavy enclosed coil springs.

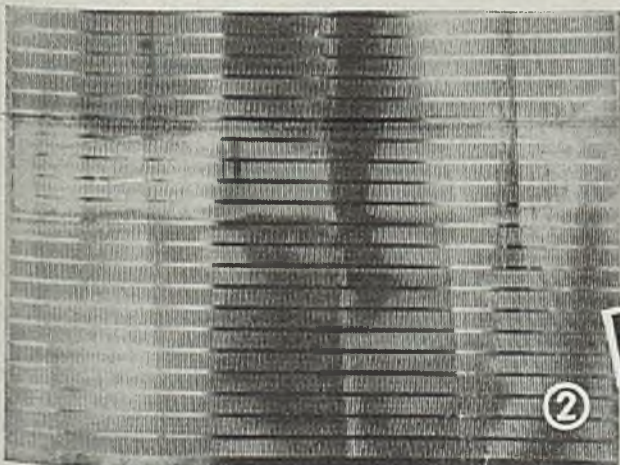
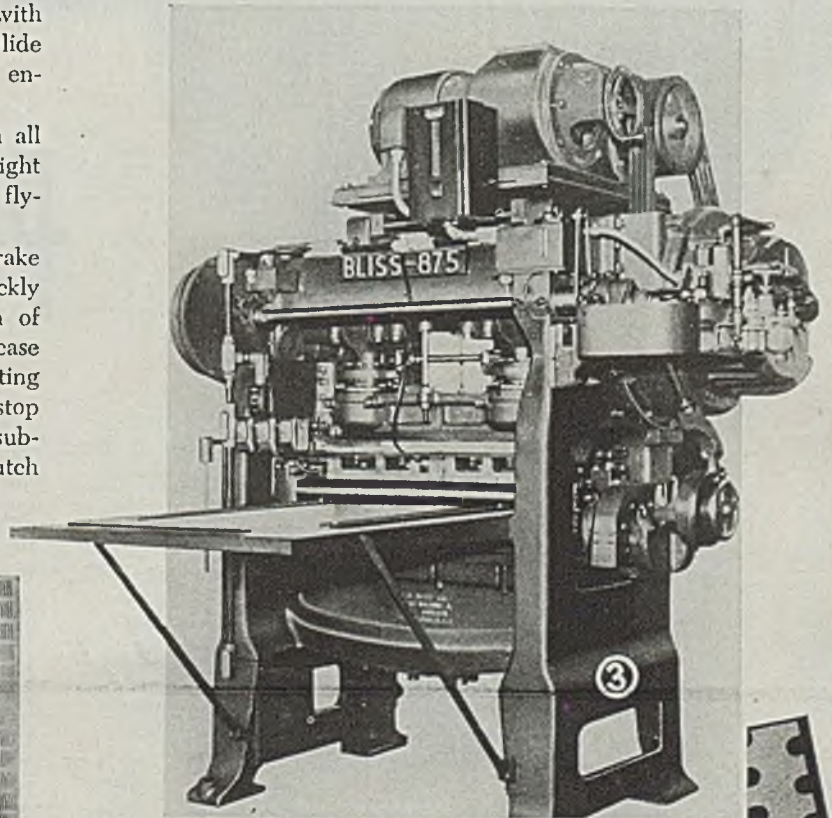
Crankshaft is of full eccentric type, with bronze in all bearings. It is driven by helical steel gears in an oil tight guard for silent performance. Driveshaft and the flywheel are mounted on Timken roller bearings.

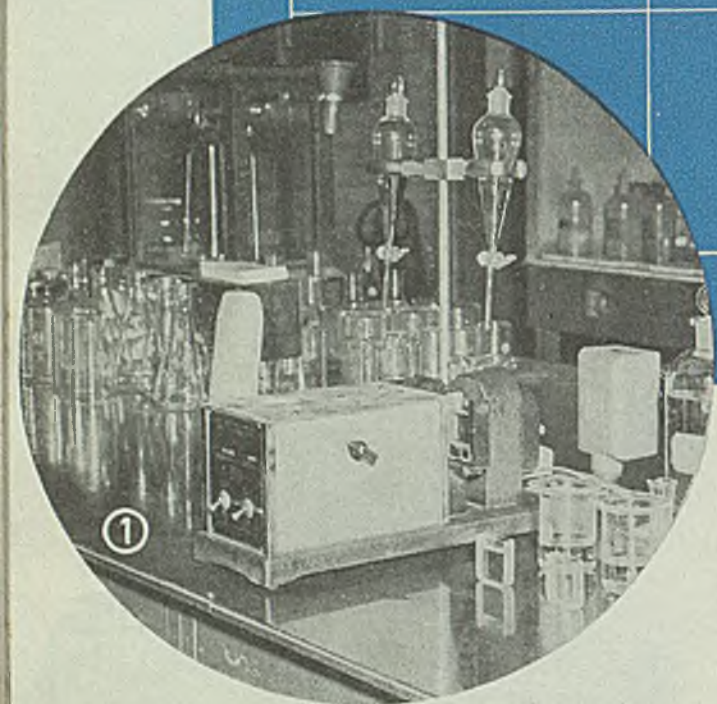
Clutch is an air operated disk type with integral brake disks. It will stop the press automatically and quickly when air valve is shut off. Louvers for ventilation of clutch are provided in guard for flywheel of press in case of frequent inching of the press. Under normal operating conditions, the clutch is operated only occasionally to stop and start the machine for each sheet inserted. A substantial guard covers the flywheel, V-belts and the clutch

to give full protection from moving parts of the machine.

Clutch is controlled by a quick-action, solenoid operated air valve. It is controlled by push buttons—start—top stop—and inch—in convenient position for operator. Top stop button operates through a rotary limit switch having an adjustable cam on feed shaft. It is readily adjusted for

(Please turn to Page 156)



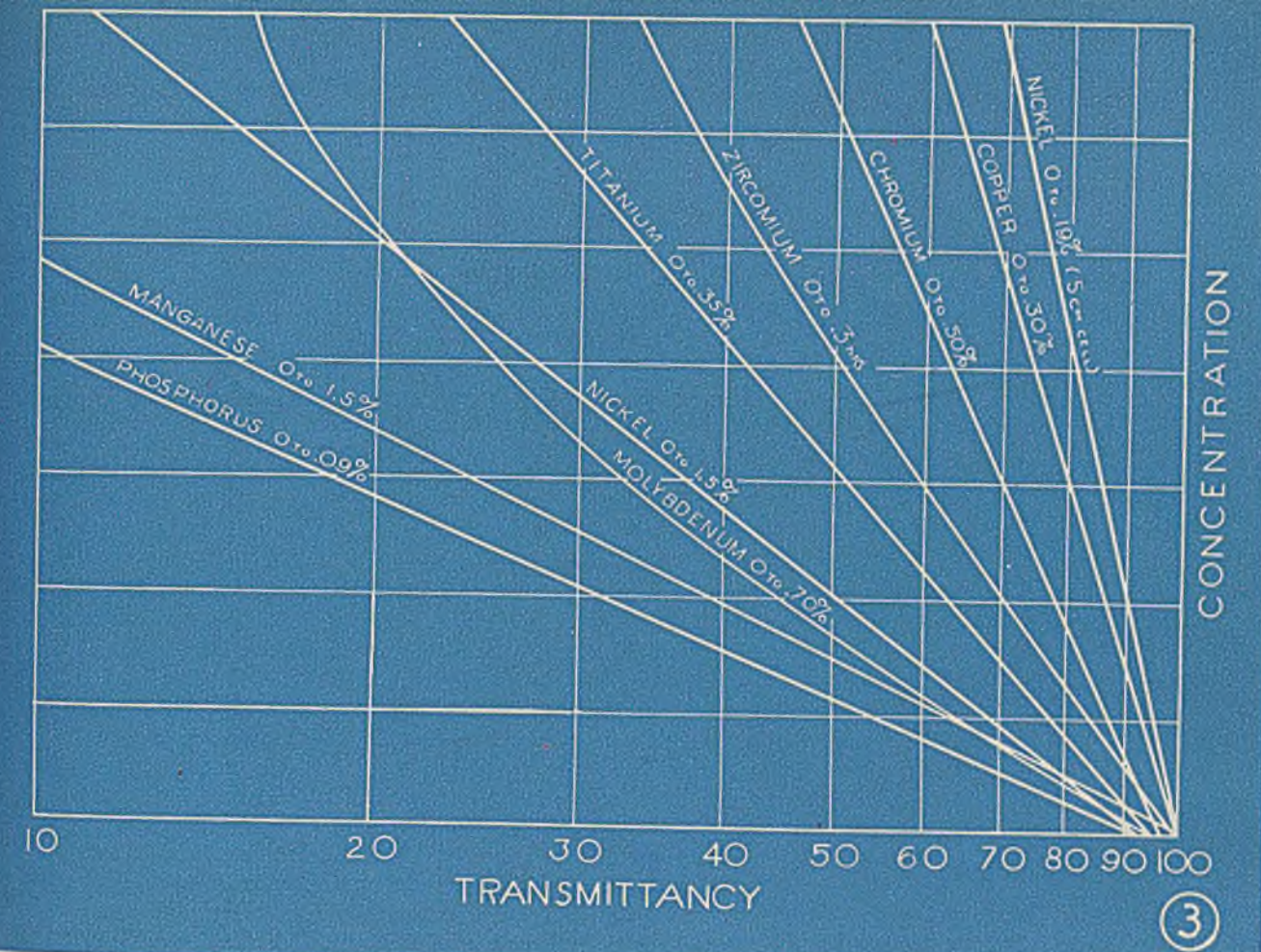
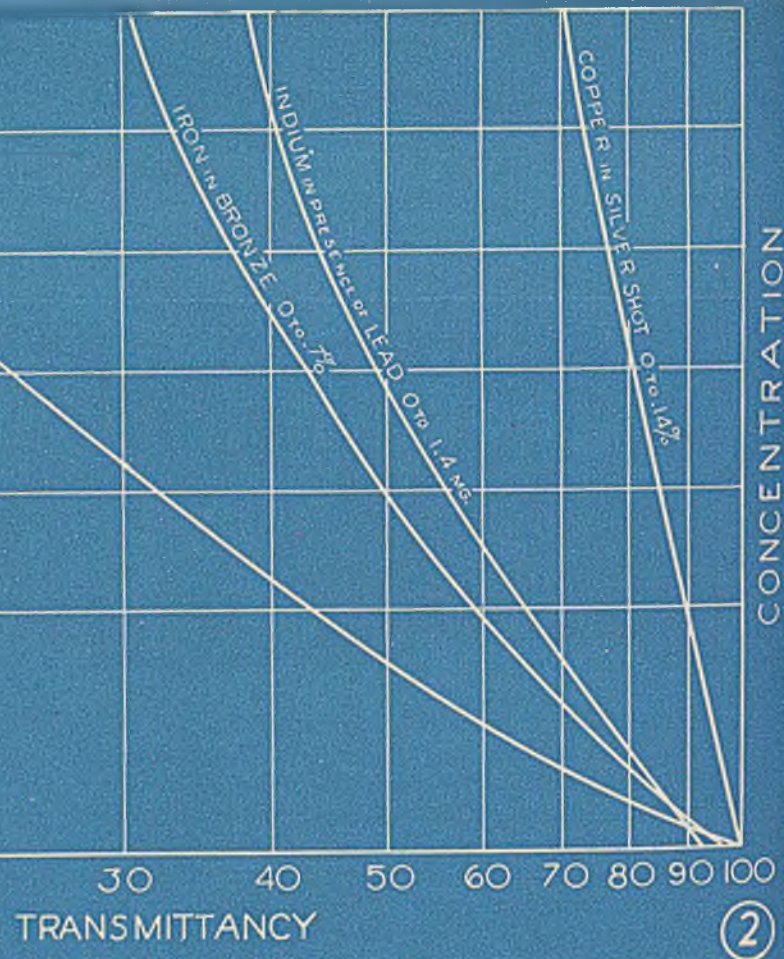


By JOHN PARINA, JR.
Assistant Editor, STEEL

Fig. 1—Compact and accurate, the Cenco photometer has speeded analysis of molybdenum and other elements in the laboratories of the South Works plant of Carnegie-Illinois Steel Corp. At right of instrument are the absorption cells which hold the solutions to be analyzed. Photo courtesy Carnegie-Illinois Steel Corp.

Fig. 2—Typical analytical curves of determinations in the analysis of nonferrous metals grouped to show the character of curves obtained

Fig. 3—Analytical curves of determinations for elements commonly found in steel. Graphs of Figs. 2 and 3 are plotted on semilogarithmic calibration paper



PHOTELOMETRIC ANALYSIS

DESIGNED for making rapid transmittancy measurement of colored solutions in the identification and quantitative determination of chemical constituents, the Cenco-Sheard-Sanford photometer has been used successfully in metallurgical laboratories. Unusual features of this instrument are the use of optical filters to limit closely the wavelength of the light source to that of the absorption band of the test solution, and the use of a light source whose intensity remains constant in spite of line voltage fluctuations.

Three essential components of the instrument, made by Central Scientific Co., Chicago, are the optical system, the carrier for the absorption cell, and the electrical measuring system. The optical system consists of a 6 v incandescent lamp operated by a transformer of constant wattage output, a precision iris diaphragm; and a light filter with suitable transmission characteristics.

Voltage supplied by power or lighting lines varies considerably as a result of the load on the lines. Proper voltage must therefore be supplied to insure constancy of the light source which largely controls the reproducibility of

the results. The transformer used in the instrument makes possible use of line voltages varying from 105 to 120 v, yet total change in the reading of the meter is less than 1/2 division on the scale of 100 divisions, or a deviation of less than 0.5 per cent.

A photocell of the self-generating type and a highly sensitive, low resistance microammeter comprise the electrical measuring system. Linear response between light energy falling on the photocell and the current through the microammeter is secured by maintaining low intensity of the light. Since the closest proportionality between illumination and current is secured with a direct short circuit of the cell, the measuring instrument, therefore, approaches this minimum of resistance as closely as possible, and also possesses adequate response to low intensity of light.

Fundamental principle upon which the operation of the instrument is based is the fact that any solution which shows color, however slight, does so by virtue of its selective absorption of light. Since this absorption of light is caused by the solute, analysis of a solution by percentage transmittancy of light is possible inasmuch as increasing

High accuracy and greater speeds in chemical determinations are virtues of an analytical instrument now finding increased use in metallurgical control laboratories. Light source is not varied nor does instrument indicate transmission value of a solution for total spectral band of light source

absorption will occur with increasing concentration. However, intensity of light source is not varied nor does the instrument indicate the transmission value of a solution for the total spectral energy of the light source, but rather through the use of optical filters, measures the transmittancy of a solution in a spectral band confined to the region of the characteristic absorption band of the solute being determined.

By using only the light which is included in the wavelength range comprising the absorption band of the solution containing the sample, that region of the spectrum is measured in which the greatest change in transmittancy occurs with a change in concentration. Regions of the spectrum which are unabsorbed by the solution are excluded. Consequently, if such a filter is used with a barrier-layer photocell and a sufficiently sensitive meter, the combination provides an abridged spectrophotometer or filter photometer.

Since photoelectric photometry is essentially abridged spectrophotometry, the theoretical principles are the same.

(Please turn to Page 137)

HONING...

for precision and production

ELECTRICAL refrigeration manufacturers, confronted with a plus limit of an impatient market demand and minus almost complete labor unrest, have tackled its reconversion with enthusiasm. After substantial re-tooling for revised processing, two or three-shift operation is now in effect in most plants. Production quotas for some units in some plants are now as high as 27,000 per month.

Manufacturers in this industry are keenly alert to any technological improvements which provide increased control in precision machining, which generate closest tolerance accuracy, size and surface finish. They have good reason to be. For some years past many of them have been sealing up their units and guaranteeing maintenance-free operation for periods ranging from 5 to 10 years.

The closest obtainable precision in forming, sizing and finishing is basic in this policy of manufacturing and merchandising. For sustained efficiency, bores must be round and straight, and their axes square with the end faces of the part—all within the closest obtainable limits. All mating parts must be fitted in assembly within tolerances of less than 0.0005-in. Surface finish must be relatively smooth to minimize frictional wear, to assure true wedge-film lubrication and for quiet, vibrationless operation.

Bores usually honed comprise compressor cylinder bores, crankcase or crankshaft bearing bores, roller bushing bores, piston pin bores and connecting rod crankshaft bores. Bore sizes are relatively small, ranging from ½ to 3½ in. in diameter and ½ to 4 in. in length. Most of these bores are in bearing assemblies comprising malleable or cast iron on cast iron, or steel on cast iron. Parts design is frequently severe with

(Please turn to Page 140)

Fig. 1—Elements of automatic size control provided in microhoning process include: Honing tool, plastic mounted abrasive members and master sizing ring gage shown here

Fig. 2—Representative setups for honing crankshaft bearing bores. These bores are usually from ⅜ to ¾-in. in diameter and from 1½ to 3½ in. in length

Fig. 3—Typical applications for honing compressor cylinder bores

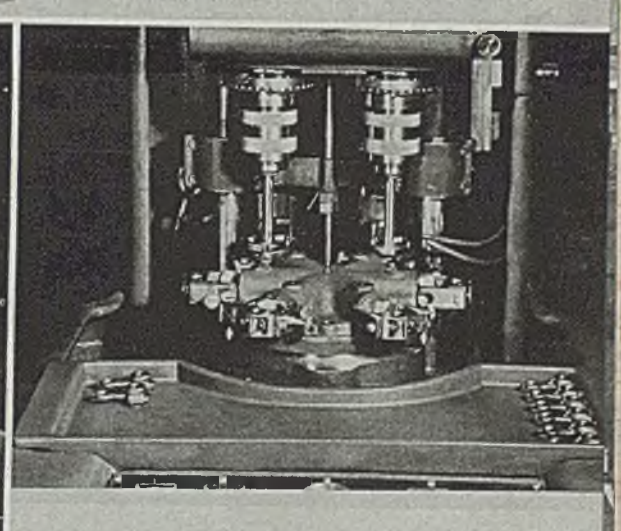
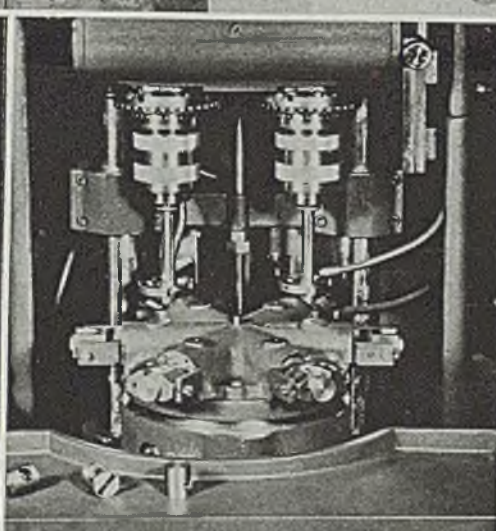
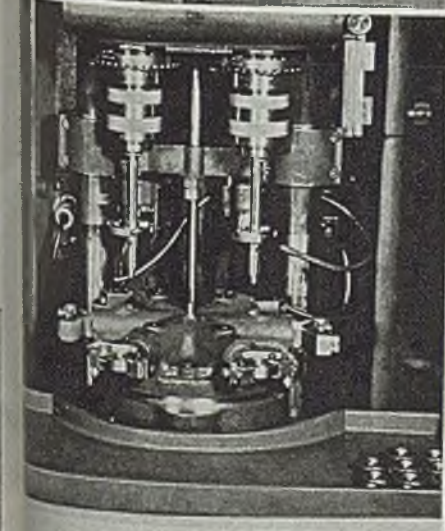
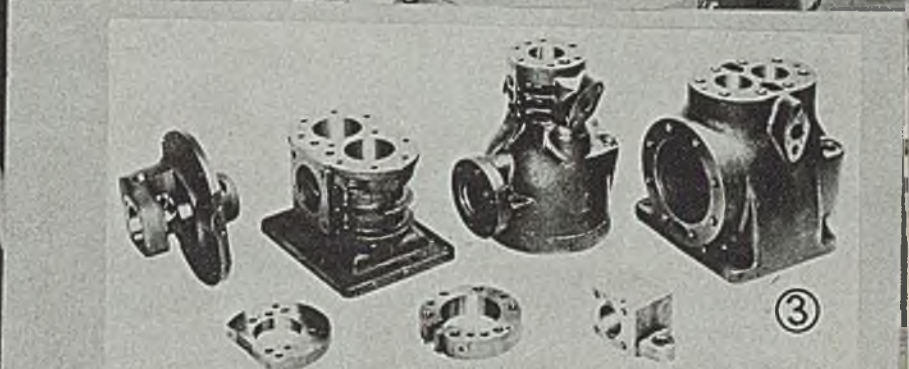
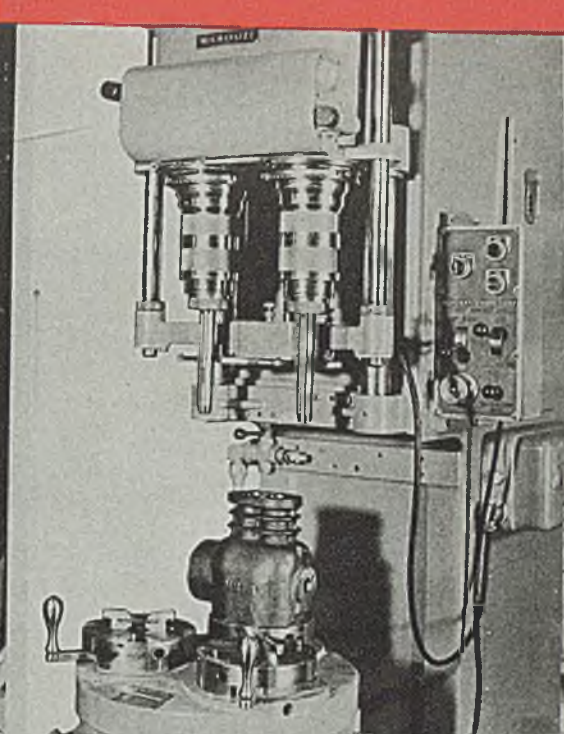
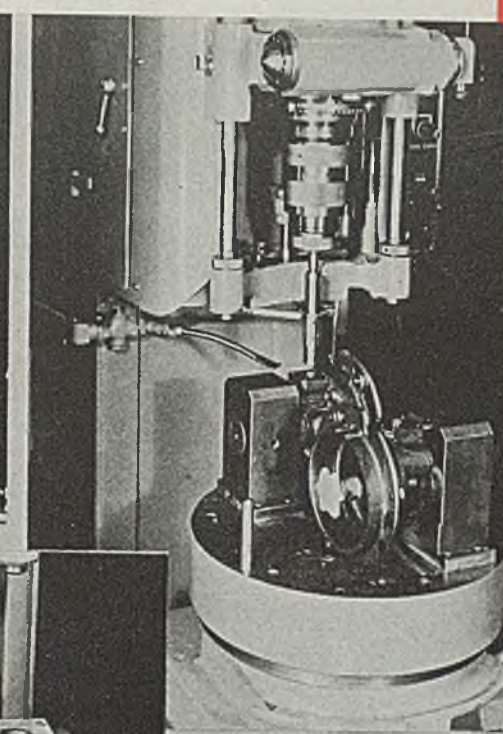
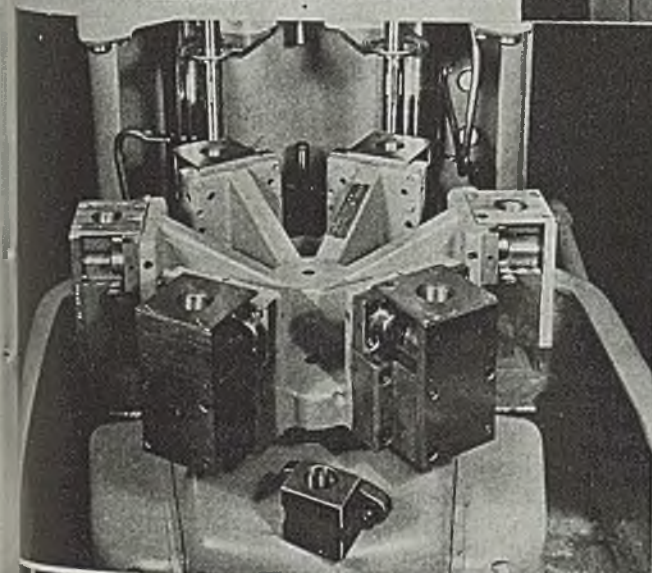
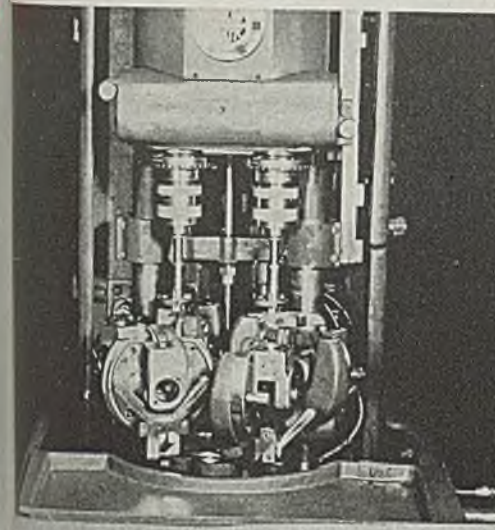
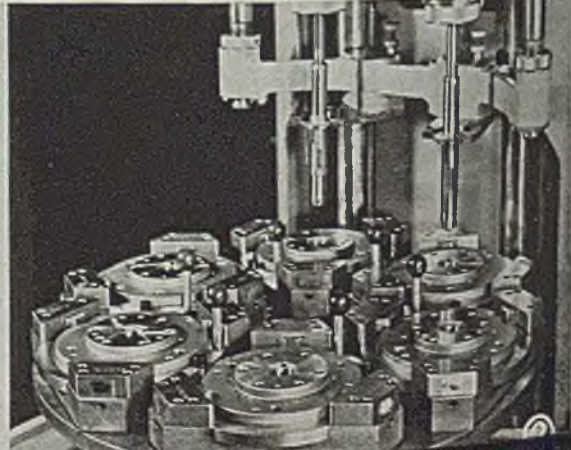
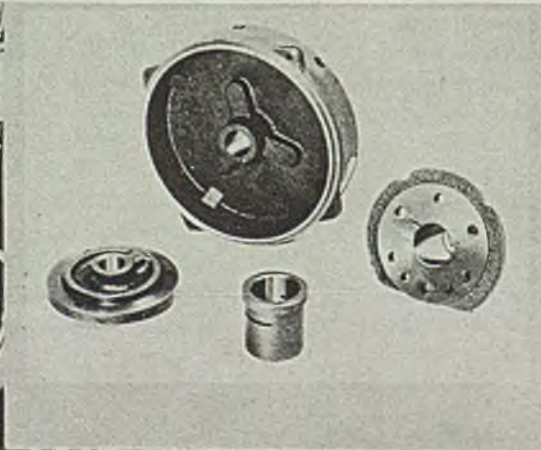
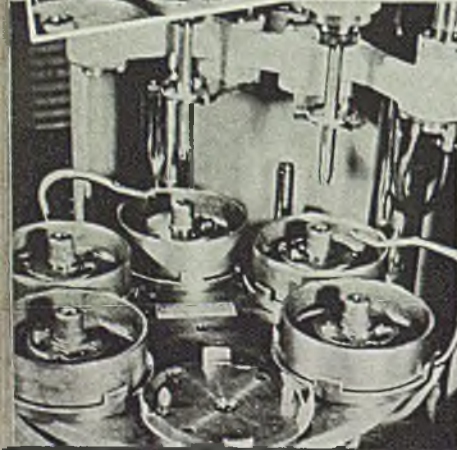
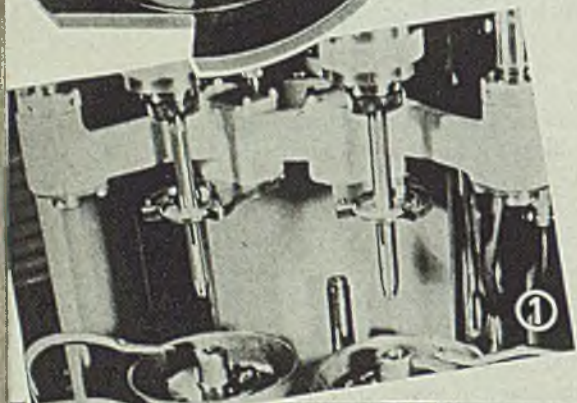
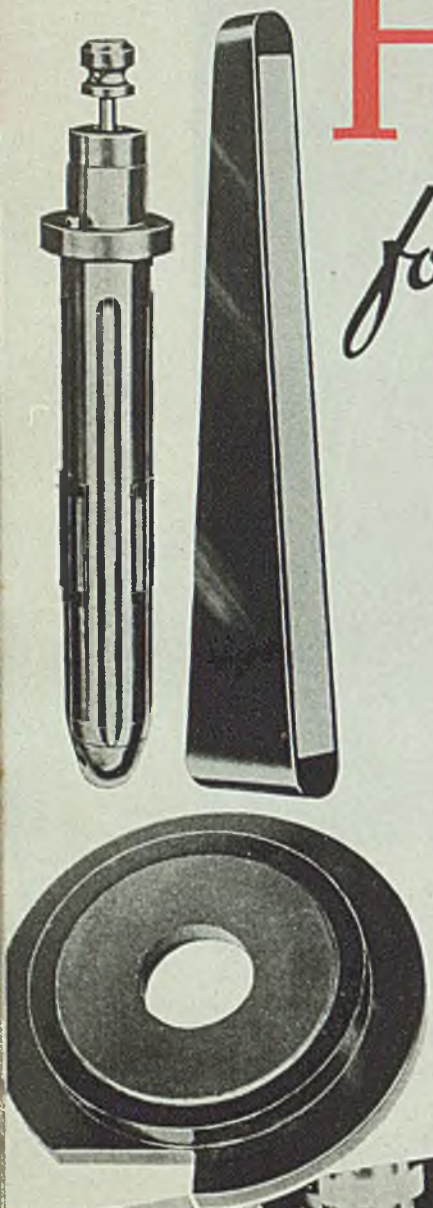
Fig. 4—Setup employed for the honing piston pin bores

Fig. 5—Application for honing bores in cast iron piston pins

Fig. 6—Bores in cast and malleable iron connecting rod crank pins are honed in this setup

Newly developed honing equipment insures close tolerance accuracy, size control, surface quality, rapid stock removal and longer tool life

By L. S. MARTZ
Assistant to the President
Micromatic Hone Corp.
Detroit



18,000-TON FORGING PRESS

Huge Mesta forging press, together with special forging and heat-treating furnaces, produces large magnesium and aluminum alloy forgings; new \$5,000,000 Wyman-Gordon plant is especially designed to house the 2050-ton unit and auxiliary equipment

PRODUCTION of magnesium and high aluminum alloy forgings of a size previously unattainable is now possible with the installation of an 18,000-ton hydraulic die forging press in Wyman-Gordon Products Corp.'s new \$5,000,000 plant at Grafton, Mass. The company, a subsidiary of Wyman-Gordon Co., Worcester, Mass. and Harvey, Ill., is operating the new plant, which was designed and engineered especially to house the gigantic machine and its auxiliary equipment, under the Reconstruction Finance Corp.

The press, termed the largest in the world, weighs complete, including motors, pumps, piping etc., 2050 tons, and was built and installed by Mesta Machine Co. of Pittsburgh. Area of its platen is about 12 x 7 ft; its pressing speed is 360 ipm. Statistical data are included in the accompanying table.

Constant, fast and precise control of all operations of the press is its outstanding feature. Design and production of the unit and its auxiliary equipment was carried on completely within the Mesta plant, the steel used being produced in the Mesta open hearth department and steel foundries.

The large castings, each weighing in excess of 200 tons, were limited in weight by the capacity of the railroad to handle them, and even then special routing had to be employed in shipping them to their destination.

According to Wyman-Gordon, the 18,000-ton press will not be used for forging steel or steel alloys. Magnesium, and to a considerable degree, high-strength aluminum alloys, under forging hammers, are brittle and subject to

fracture. Thus to attain larger forged parts from these alloys, a need demonstrated in war, this press was built with heat-treating and auxiliary equipment engineered to handle especially these metals.

While primarily built to produce larger forgings for aircraft, this equipment will not be used entirely for this, but is expected to contribute materially to new civilian uses of magnesium and aluminum alloys.

Three propane-fired, apron conveyor-type forging furnaces designed and installed by R-S Products Corp., Philadelphia, supply the press with magnesium or aluminum billets uniformly heated to the proper temperature. Each of these furnaces has a heating chamber 8 ft 6 in. wide by 39 ft long, and a rated output of 4400 lb of magnesium billets per hour.

Furnaces are of the forced convection type arranged for automatic temperature control in three zones; each zone having an external air heating chamber and duplicate high volume, motor driven, double-wall insulated fans. All air heaters and recirculating fans are mounted on top of the furnace with a platform at both sides to facilitate maintenance of the equipment. A temperature uniformity of plus or minus 2° F was secured on the initial test runs, exceptional for equipment of this size.

Propane fuel is burned in radiant tubes equipped with spark plugs for electric ignition. The tubes are installed in the external heating chambers; air is circulated over the tubes and then directed downward through masonry ducts at both sides of the furnace and discharged into the heating chamber under the conveyor. After the air

PRESS

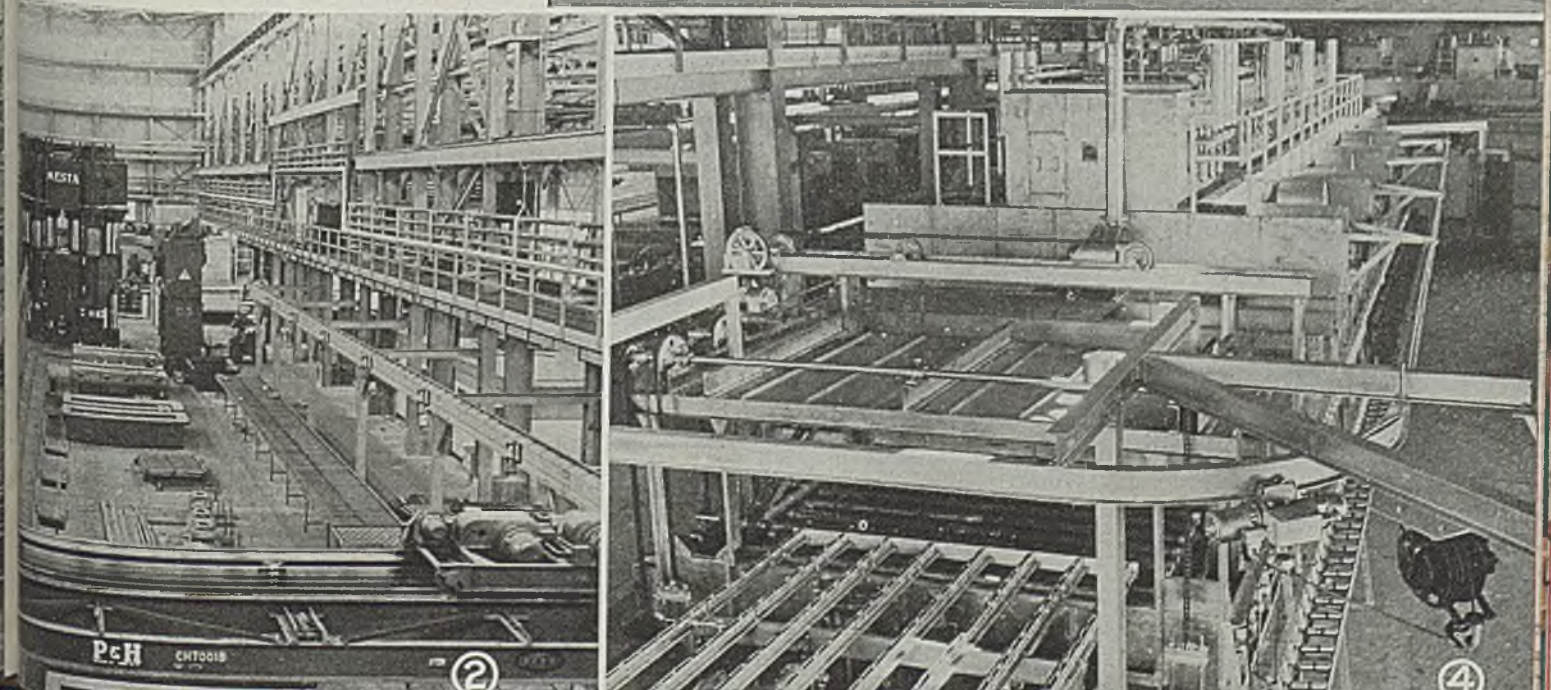
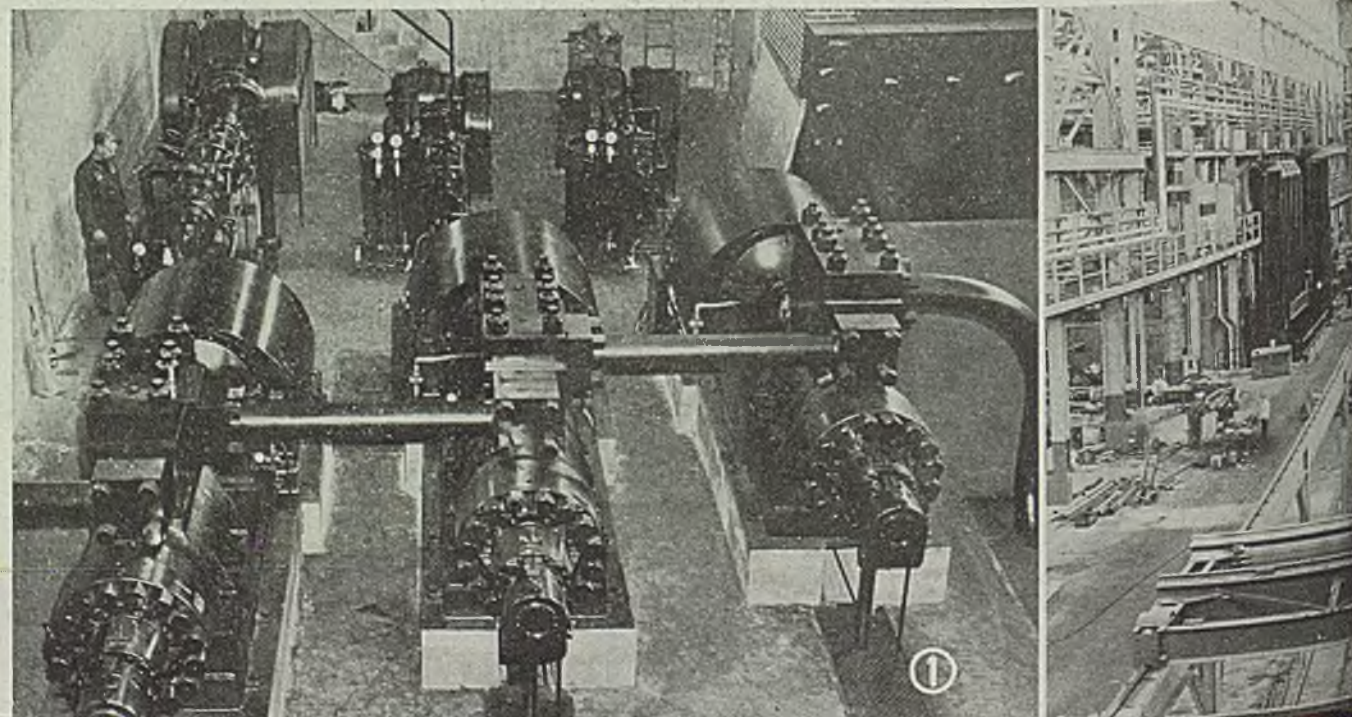
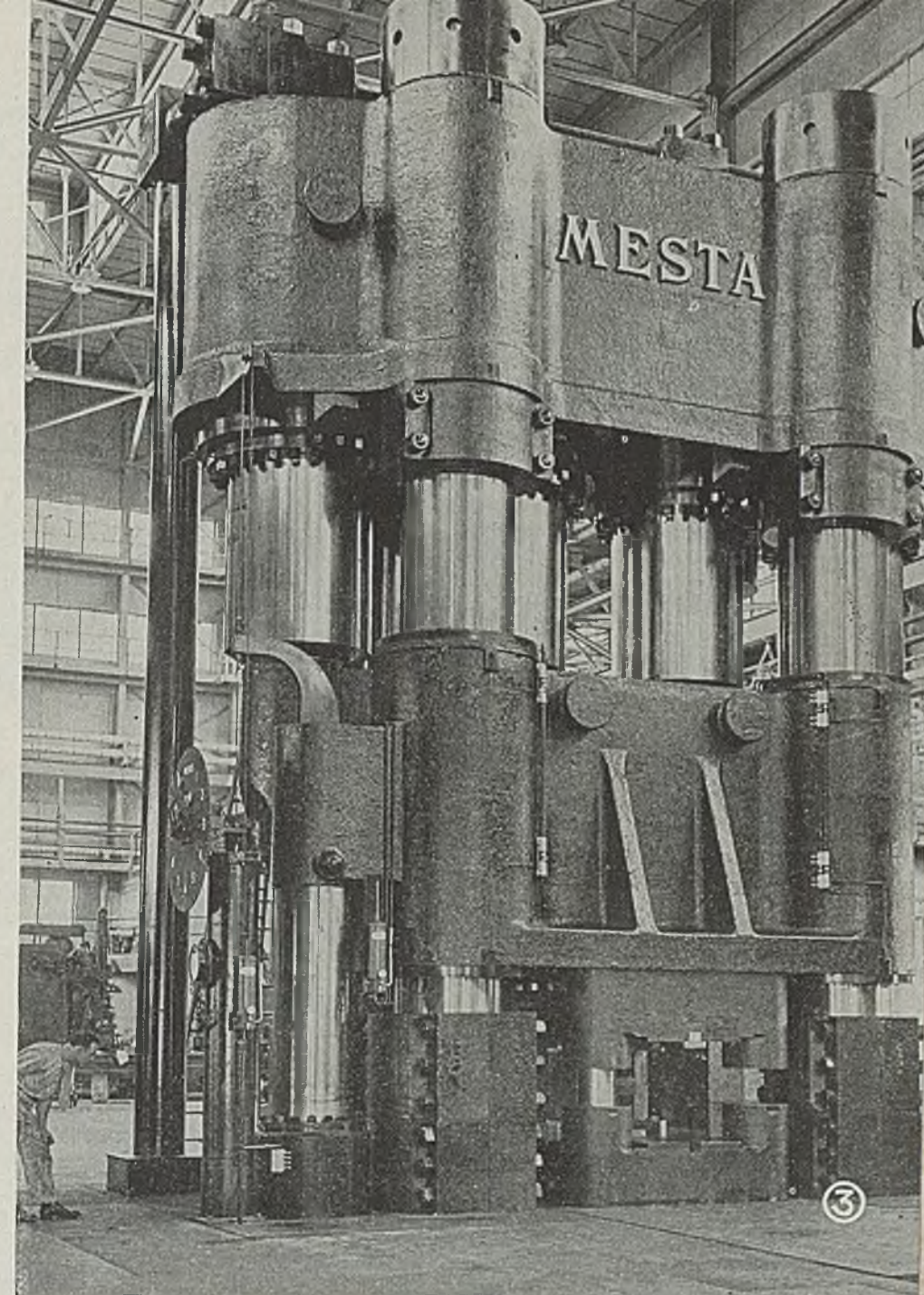
By L. E. BROWNE
Associate Editor, STEEL

Fig. 1—Three 1000-hp pumps used in connection with Mesta 18,000-ton die forging press installed in Wyman-Gordon Corp.'s \$5,000,000 plant at Grafton, Mass.

Fig. 2—General view of forge shop in the new plant showing the die forging press in relation to other equipment

Fig. 3—Closeup of giant die forging press. The castings embodied weigh in excess of 200 tons

Fig. 4—Forged parts are heat treated in this furnace installed by R-S Products Corp. of Philadelphia



passes through the work, it is returned to the heaters through masonry ducts for reheating. Use of radiant tubes in the external heating chambers eliminates possibility of damage to the surface of billets or forgings due to impingement of combustion products during heating for forging. Each furnace is equipped with a separate motor-driven Spencer blower to provide combustion air for the radiant tube burners.

Designed to operate at any desired temperature between 250 and 1000° F, furnaces are equipped with Leeds & Northrup automatic temperature control of the full proportioning type with automatic drop correction. Indicating controllers are furnished for each external heater and each work zone, both instruments in each zone working with the same motor-operated control valve. In addition, two 3-point recorders provide a continuous record of temperatures in each external heater and each work zone in each furnace.

High limit control switches are provided in the recorders to close the

main fuel valve and sound an alarm in the event of excessive temperature at any of the points recorded.

As additional insurance against excessive temperature conditions, a separate Wheelco Limitrol is used on each zone as an overall high-limit control, to close a solenoid valve to shut off the gas at each zone. Air flow switches are installed at each fan to shut off the solenoid gas valve at each zone in event either of the fans stop for any reason. A duplex safety shut-off valve also is installed on each furnace to close in case of air, gas or power failure.

The work, billets or partly formed stock, is carried through the furnace on an apron conveyor consisting of flat bars attached to roller chains supported locked by limit switches. Timers and on channel tracks. The bars provide a firm support for the work and permit good circulation of air through and around the work. The conveyor is returned under the furnace and supported on wheel track rollers.

To permit maximum flexibility in the

plant layout, the conveyor is arranged to be driven in either direction. Separate drive units are provided at both ends of the furnace, and uni-directional clutches and interlocked motor controls assure safety of operation in either direction. All motor controls are mounted in an enclosed control center located at one side of each furnace adjacent to the temperature control panels.

Furnace Handles 40 Trays

Forgings produced in this plant are heat treated in a pusher type, roller rail, convection type furnace also designed and installed by the R-S Products Corp. This furnace has a heating chamber 12½ ft wide by 61 ft long and has a rated capacity of 2000 lb per hour and a temperature range of 250 to 1000° F. The furnace is arranged for automatic control in four zones, and the same system of forced convection heating and temperature control is employed as on the continuous forging furnaces already described.

Work to be heat treated is pushed through the furnace in steel trays in two rows on roller rails. The furnace will hold 40 trays at one time. Motor-driven rollers are provided at the discharge end of the furnace. Thus the trays can be discharged quickly from the furnace on to the elevator in the quench tank. Quench tank is located at the discharge end of the furnace. It is equipped with motor-driven rollers, an air operated elevator and steam-heating coil.

Water temperature control is provided to hold the temperature between 100 and 210° F, as desired. Water is drawn off at the top of the tank by a centrifugal pump driven by a 20 hp motor and is forced through a manifold located at the bottom of the tank and discharged uniformly over the tank area setting up rapid circulation in the tank.

A timer is provided to control the duration of quench, and another timer to control the drain interval after the elevator has removed the work from the quench position. A third timer controls the interval of pushing trays into the furnace.

The furnace is equipped with a motor-driven pusher, motor-operated doors and motor-driven discharge rollers, all interlocked by limit switches. Timers and

(Please turn to Page 156)

STATISTICAL DATA

Weight of press complete, including pumps, piping, motors, etc.	4,100,000 lb
Total horsepower including three—1000 hp pumps	3355.5
Maximum water pressure	5300
Volume of water	18,000 gal.
Pressing speed	360 ipm
Area of platen	12 ft 4 in. x 7 ft 1 in.
Height of press above floor	32 ft
Depth of press below floor	15 ft 6 in.
Cubic yards of concrete in press area complete	2150 cu yd
Time to fabricate	Nov. 14, 1944 to Mar. 1, 1945
Time to erect	3 months

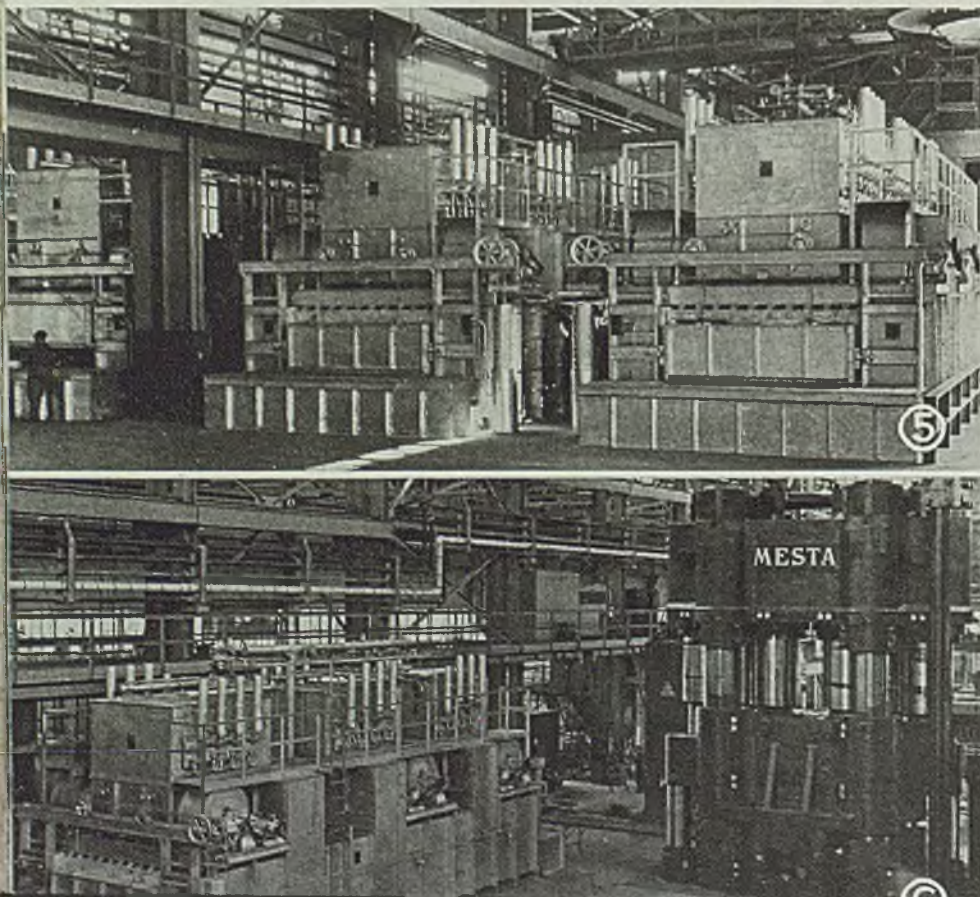
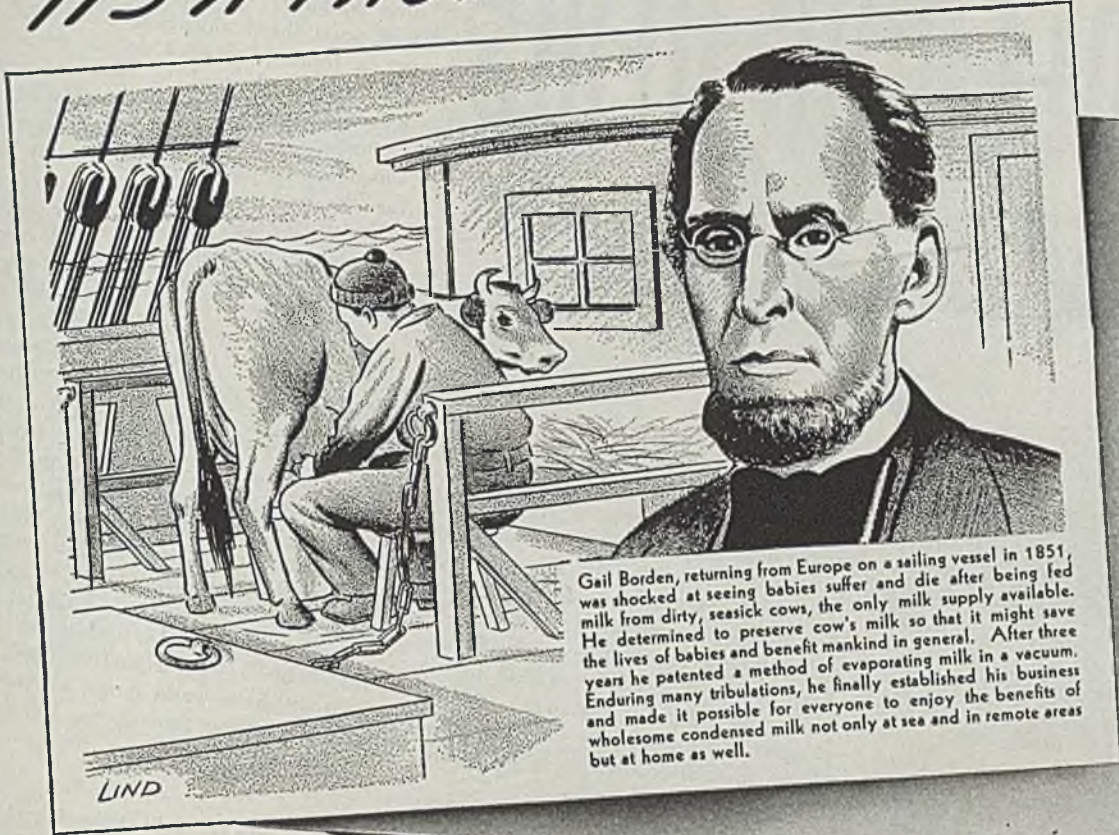


Fig. 5—View of forging furnaces also installed by R-S Products Corp. of Philadelphia

Fig. 6—Forging furnaces shown in relation to the huge Mesta press in the plant

IT'S A FACT!



Gail Borden, returning from Europe on a sailing vessel in 1851, was shocked at seeing babies suffer and die after being fed milk from dirty, seasick cows, the only milk supply available. He determined to preserve cow's milk so that it might save the lives of babies and benefit mankind in general. After three years he patented a method of evaporating milk in a vacuum. Enduring many tribulations, he finally established his business and made it possible for everyone to enjoy the benefits of wholesome condensed milk not only at sea and in remote areas but at home as well.

It's a better known fact

**THAT J&L TIN MILL PRODUCTS HAVE
THE QUALITIES THAT GIVE LONG SERVICE**

The controlled temper and uniform gage of J&L Tin Mill Products make it possible for them to go through your shaping and forming operations with best results. Their superior surface improves the attractiveness of any product and provides excellent adhesion for lacquers, porcelain enamel and plastic coatings as well as lithographed and painted designs.

J&L Hot Dipped and Electrolytic tin plate and terne plate have the evenly distributed coatings necessary to make soldering operations go smoothly and to provide full protection for the desired service life.

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH 30, PENNSYLVANIA



ENGINEERING NEWS *at a glance*

FROM Akron, B. F. Goodrich reports several new uses for its Rivnut include attaching shelves and freezer units on refrigerators and bayonet door catches for kitchen cabinets. Another manufacturer is using the development in connection with metal signs, utilizing the Goodrich product to hold wooden letters to the metal. Product was originally developed for use as a blind rivet, nut plate or both.

IN THE magnesium foundry, it is possible to use the fluoroscopic method of inspection to a considerable degree, since resistance of magnesium to x-rays is low enough to give a fairly bright image on the screen for thickness. According to George Mullowney, industrial radiologist, North American Phillips Co. Inc., New York, a great deal of the

merit of fluoroscopy depends on the eye sensitivity of the person making the examination. For this reason, it is impossible to state exactly how fine a defect can be detected fluoroscopically. Since fluoroscopy is a viewing of the specimen image which appears on the fluorescent screen only while exposed to the x-rays, no record is obtained. Thus it is often advisable to check reliability of the method by making a radiograph for prolonged study.

DOWN in Dayton, O., where many refinements are made for our Army "flyboys," Major General Benjamin W. Chidlaw, deputy commander of engineering attached to the air technical service command, says problems of keeping the United States pre-eminent in the field of military aviation are approached



TO SUPPLEMENT its flyaway schedule, Cessna Aircraft Co., Wichita, Kans., now spot-delivers six planes in one truck, providing customers in that particular locality the advantage of receiving a brand new plane on which only the hours required for testing are logged. Method of delivery also results in considerable customer saving on transportation charges. Accompanying view shows how planes are "packaged" for truck delivery

many times in these new days of peace from what the boys in the laboratories call the "Buck Rogers" angle. Imaginative engineers and scientists, he said, look years ahead, projecting their thinking in terms of what a decade or two industriously devoted to research will bring. They see vast concepts of world-ranging rocket power, developments which now may seem only fantasy in the Sunday comic strips. So alluring and strategically bedazzling are these weapons, prediction makers to laymen may seem to be living in a world apart from ordinary citizens. But make no mistake. They aren't dealing in impossibilities. Those "Buck Rogers" weapons are on their way. We are going to have them and, if we are canny, we will make sure we have them before a possible aggressor nation can develop them. It is entirely probable a future war, if it should come a decade hence, will be an air war, much of it fought without pilots, a nightmarish melange of rockets and other air weapons. Each of the rockets will pack the destruction of a city within its streamlined warhead, and each will have world range, extreme accuracy, hurtling through the ionosphere at supersonic speeds.

AUTOMATIC retraction of a threader developed recently by Peerless Tool & Engineering Co., accurately controls the runout at the end of the thread precisely at the same place each time the cutting tool passes over the part, it is reported. According to the Chicago firm, the Lawrence Thread Faster, as the development is called, can be easily attached to any bench lathe equipped with carriage, cross slide or other threading facilities. It permits the lathe to be run at top speed, and the use of a carbide tipped tool as the operator is not limited by his ability to retract the tool at the end of the cut. Furthermore, the attachment can be used for cutting both internal and external threads, eliminating undercutting in the latter operation, it is said.

MORE recent development in industry, and one which has important possibilities, is the balancing of a titanium-containing, nickel-chromium composition so that the steel is amenable to hardening by heat treatment, according to "Vanadium Review" published by Vanadium Corp. of America, New York. Previously, only commercial method of hardening stainless of the austenitic type was by cold working. This was definitely limited by the form of the product and type of service contemplated. By adding a larger amount of titanium than is necessary to stabilize the steel against intergranular corrosion, usually with an ex-

CARBOLOY "STANDARDS" (TRADEMARK) CEMENTED CARBIDE

Speed Production, Cut Costs ON JOB LOT WORK TOO!

Here's how Oakland Machine Works*—an aggressive small shop doing diversified job-lot work, keeps tool costs low, makes fast changeovers, and meets close schedules:

1. They plan tooling to widely use low-cost, readily available "Standard" Carboly Tools—adaptable to 60-80% of most jobs.
2. For "special" tooling—not adaptable from "standards"—they design and tip them with inexpensive "Standard" Carboly Blanks from stock.

Whether your machining applications involve quantity production or job-lots, your plant, too can benefit by this low tool cost, wide adaptability, and ready availability made possible by Standard Carboly Tools and Blanks. Write for Catalog GT-175-R.

1. EXTRA DIVIDENDS FROM "STANDARDS"

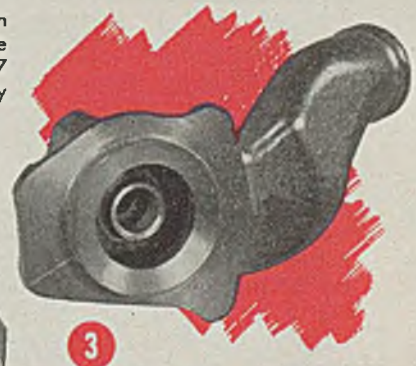
On this job-lot application—machining cast iron pulleys—"Standards" not only held down initial tool costs but also stepped up production; kept machines running 4 times longer per tool grind. For maximum savings, Standard Carboly Tools were adapted to 8 roughing and finishing operations; while all "specials," except drill, were tipped with "Standard" Carboly Blanks.

2. QUICK CHANGES AT MINIMUM COST

On job-lot work, set-ups change frequently! "Today" the job is a carbide-tipped 11-tool set-up for cast iron water pump housing parts. "Tomorrow" it may be an entirely different 27-tool set-up for one-piece aluminum fans and pulleys. By carefully planned use of adaptable "Standard" Carboly Tools, Oakland keeps tool cost down despite frequent changes.

3. MACHINING CAST IRON HOUSINGS AT 340 F.P.M.

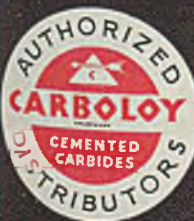
When carbide tools went on this job—machining cast iron water pump housings—speeds jumped to 340 F.P.M.; tool life stepped up 600%. For extra economy, the 7 tools used were made with "Standard" Carboly Blanks, available from stock at low cost.



*Royal Oak, Michigan

Oakland Machine Works regularly uses 3 of these Standard Carboly Tool styles.

STOCKED BY

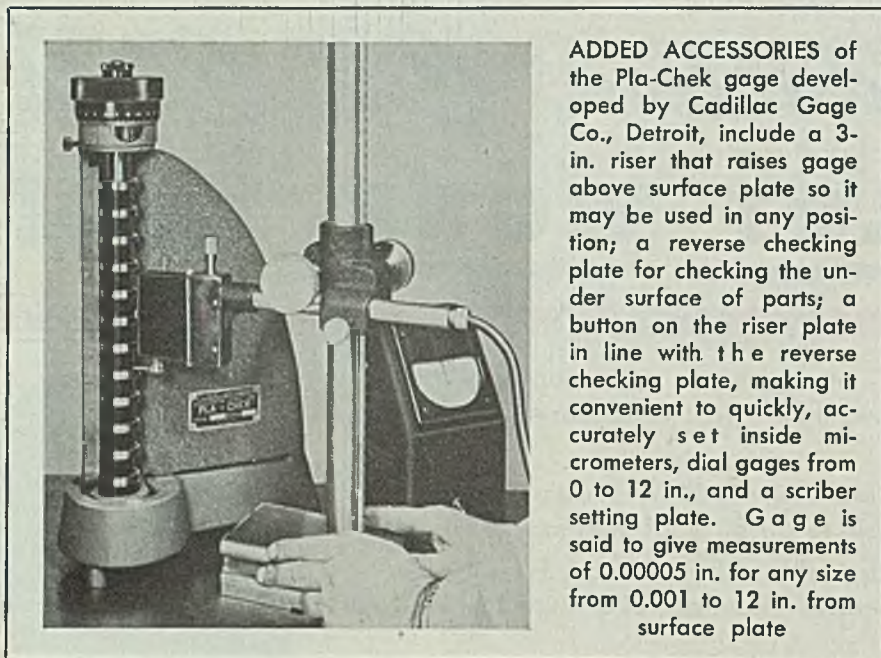


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ADDED ACCESSORIES of the Pla-Chek gage developed by Cadillac Gage Co., Detroit, include a 3-in. riser that raises gage above surface plate so it may be used in any position; a reverse checking plate for checking the under surface of parts; a button on the riser plate in line with the reverse checking plate, making it convenient to quickly, accurately set inside micrometers, dial gages from 0 to 12 in., and a scribe setting plate. Gage is said to give measurements of 0.00005 in. for any size from 0.001 to 12 in. from surface plate

cess of aluminum present, a solution and a precipitation heat treatment will harden the material as much as will cold working.

AMOUNT of solvent in paint, depth of surface hardness of metals, structural flaws in pipe or molded plastics can be detected through use of microwave tubes in connection with industrial electronic equipment, according to M. A. Acheson, manager, Advanced Development Laboratories, Sylvania Electric Products Inc. The newly developed tubes are physically smaller than radio tubes, and may be used with relatively simple waveguide systems built into production lines. Passage of the product through a series of microwave systems does not harm it or the operators, Mr. Acheson said, since power involved is only a few watts, and does not result in electronic heating, change in composition or condition of the product.

IN THE manufacture of the Navy pontoon or "Seabee jeep" in the plants formed on the Pacific islands, plate and structural steel shapes were first cut to size in the U. S., then shipped to the advance base in order to make the utmost of shipping space, according to Capt. H. W. Risteen, CEC, USNR. At the island site, material was brought into the plant daily by means of finger lifts, and the plates loaded on jigs by jib cranes. After ribs were welded on the plates, finished plates were stored next to the assembly jigs. Pontoons were tacked together in assembly jigs and trunnions installed. Plates were handled in this operation by jib cranes. Pontoons coming out of the assembly

jigs were loaded on a low railroad car and all exposed plate edges were gone over with a wire buffing wheel in order to remove rust and scale. In the pits the pontoon was suspended by trunnions and could be indexed around and held in one of eight positions so all seams could be brought into a horizontal position for welding. Inside welding was done first, then the outside seams, and last the manhole. Pipe plugs were then inserted and 15 lb air pressure applied. Leaks were detected by painting with a soap solution the seams and also portions of side and end plates where ribs had been welded.

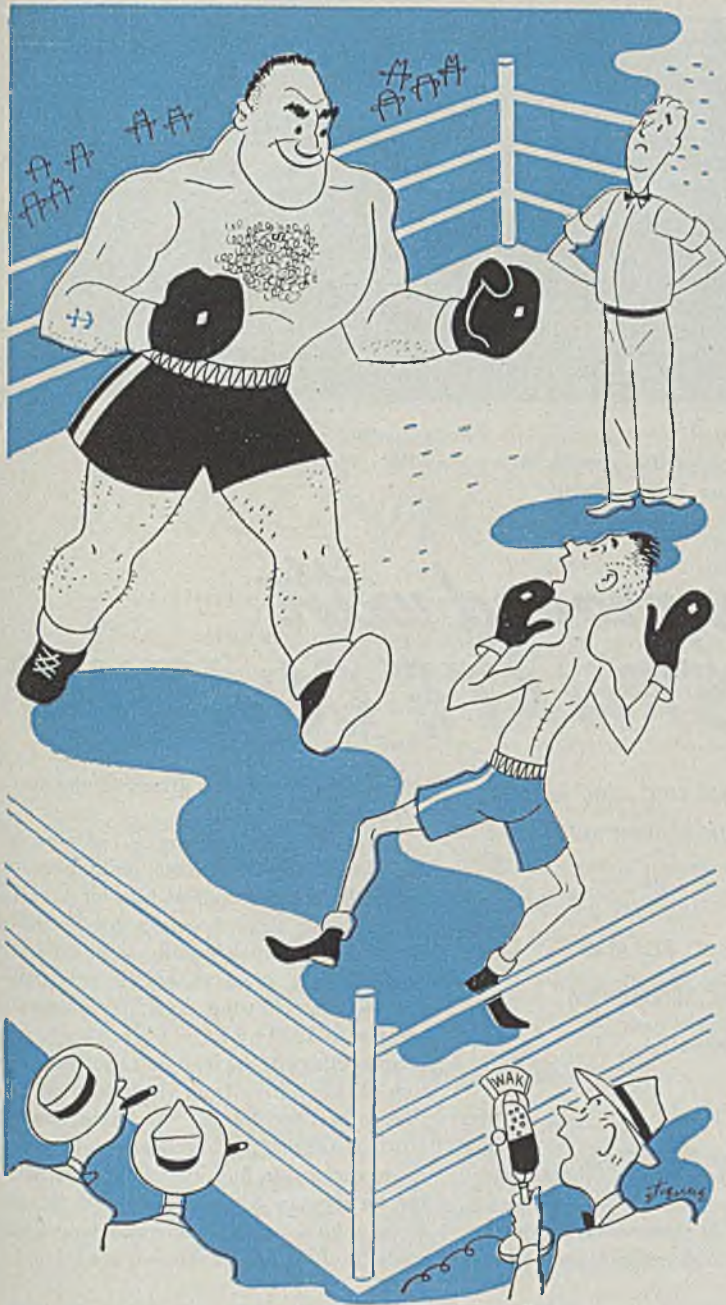
"GENERAL Electric Co. was engaged in atomic research for peacetime application before the war," Charles E. Wilson, president, said recently in commenting on the War Department's announcement of a contract with GE for atomic energy research and development and transfer of operations of the government-owned plant at Hanford, Wash. to GE. "With this background," he said, "we are convinced that the quickest possible development of nonmilitary applications not only is the most constructive solution to the problem which atomic energy presents to the world, but our greatest opportunity for more jobs and more goods for more people in the future. In our research laboratory in Schenectady we have already intensified the research in fields relating to atomic energy. The Hanford Works is an essential part of any overall program of continuing research and development of atomic power." The Hanford works is to be operated by a manager with an advisory committee consisting of H. A. Winne, vice president in charge of engineering

policy; Dr. C. G. Suits, vice president and director of the GE research lab and Dr. Zay Jeffries, vice president and general manager of the company's chemical plant.

FROM New York, the Research Lab of New Jersey Zinc Co. reports an electrochemical method for determining initial failure of paint on metal surfaces. Method involves use of vacuum tube potentiometer, which anticipates the failure of the finish before it is visible. At the lab, small spots on painted test panels are thoroughly wetted with water, and potentials read using the potentiometer. So long as potential readings for successive inspections remain constant, the film is continuing to provide protection for the metal. First definite drop in potential may be taken as an indication of initial paint film failure, since the potential of rusted metal is lower than that of unattacked ferrous material.

FACILITIES of Illinois Institute of Technology's Ohmite lab are now available on a sponsored basis, it was learned recently. The laboratory, established last year for precision electrical measurements, was set up to serve industry through the contributions of David T. Siegel, president of Ohmite Mfg. Co. Its goal is to provide precision electrical measurements for the Chicago area approaching in accuracy those of the National Bureau of Standards. Purpose of the lab is to: Provide facilities for studying fundamental measurement of resistance, inductance, capacitance, current voltage, power, power factor, permeability, etc.; provide calibration facilities for instruments and meters used in research and industry by affiliated organizations at Technology Center and by industries of the area; stimulate advanced training of electrical engineering students at the institute in precision measurements.

LATEST material which may appear in many building projects is a lightweight, high-strength aluminum product called Reynalite developed by Reynolds Metals Co. of Louisville, Ky. It consists of two sheets of aluminum bonded with a plastic adhesive to a cellulosic core to form a rigid panel. Said to be ideal for construction of walls, ceilings, doors and other building parts, the development is impervious to moisture and temperature changes and has a high insulating value. It can be fastened with usual type nails or screws and can be cut equally as well on wood or metalworking equipment.



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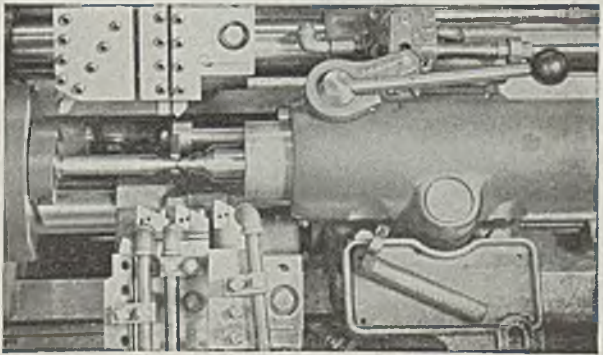
Your profits may well depend upon the efficiency of your turning operations. For instance, in your plant, turning probably accounts for 25 per cent or more of machining time. This could be substantially reduced by the most efficient use of carbide cutting tools, and an important saving in manufacturing cost effected.

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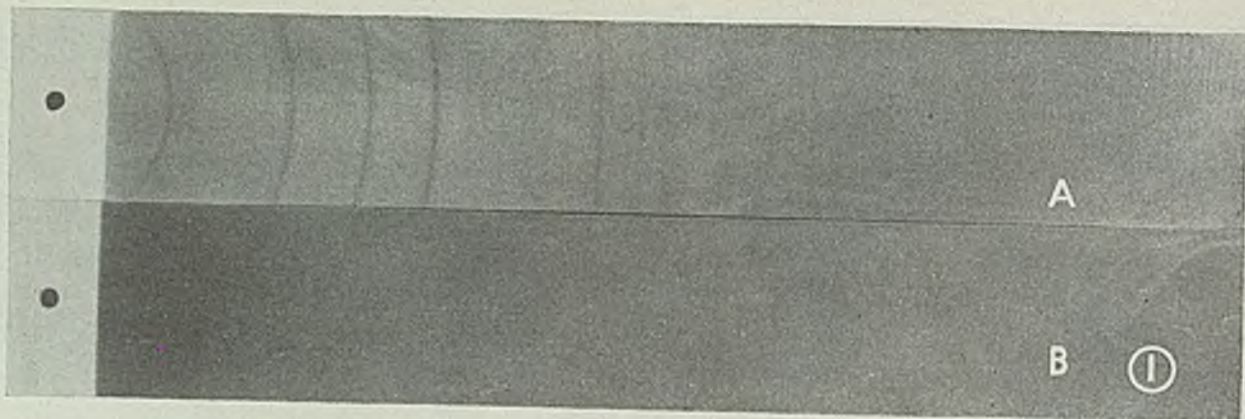


Fig. 1—(A) X-ray diffraction pattern of crystalline phosphate coating with characteristic lines evident. (B) A diffraction pattern showing no lines, indicating coating is amorphous

Finish Durability Improved with VITREOUS PHOSPHATE COATING

Cold, aqueous solutions spontaneously coat steel and zinc with amorphous film sufficiently plastic to withstand forming and drawing operations

THE FACT that vitreous phosphates are in reality inorganic polymers of great molecular weight should be an intriguing thought to the paint chemist who has already put to such successful use many of the organic polymers. While this is a fact to stimulate the mind of the theorist, the plain statement that cold, aqueous solutions of a new phosphate coating spontaneously coat steel and zinc should arouse the interest of the practical—especially when it is added that the film, known as Banox, is insoluble, corrosion-resistant and paint-bonding.

As might be expected of such materials, these solutions are of the colloidal type. In common with substances of this class, surface forces are of paramount importance. It can be shown that the particles

carry a positive charge, while most metals immersed in the solution are relatively negative. Consequently, when these metals are dipped in an unheated Banox solution there is almost instantaneous deposition of a film of amorphous metal-phosphate

without roughening or attack of the surface.

Historically, the coating is the newest use of the complex vitreous phosphates—materials which remained idle for over a century after their discovery by Thomas Graham, but which rapidly assumed importance in a great variety of industrial applications following their first commercial use in 1929 by R. E. Hall.

Something can be learned about the nature of the coating from visual inspection. Like other exceedingly thin films, these coatings diffract light reflected from the metal surfaces. In fact, the entire spectrum can be reproduced on smooth steel panels by so regulating the immersion time that coatings of various thicknesses are formed.

By C. T. ROLAND
and
H. I. ROSENBLOOM
Calgon Inc.
Pittsburgh

Fig. 2—Graph showing resistance of Banox coated steel to high temperature oxidation at 1112° F for 1 hour

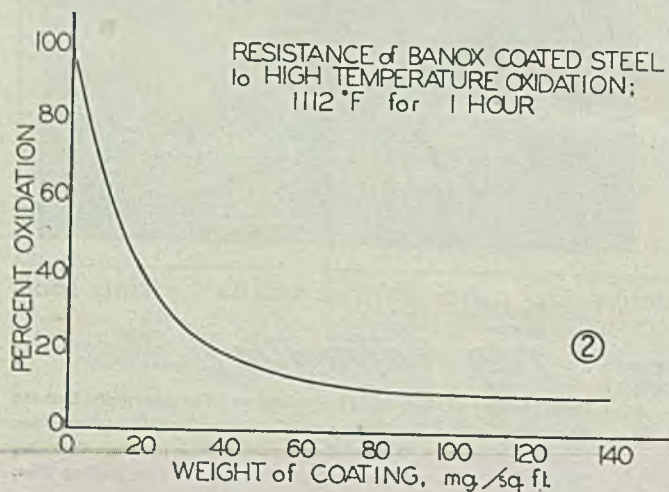
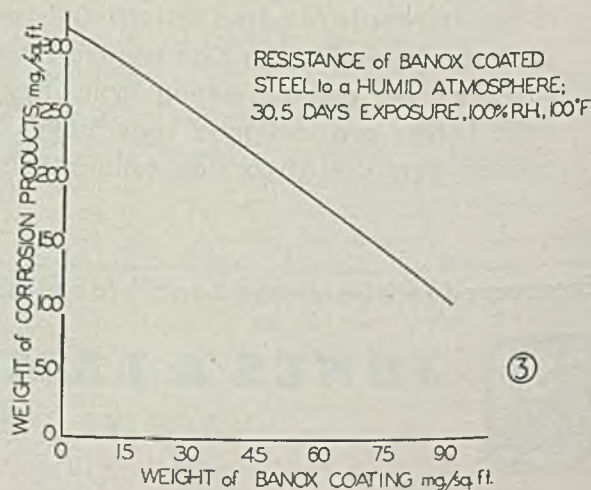
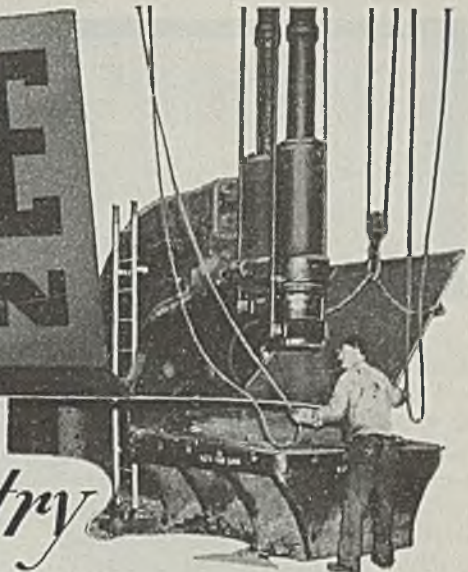


Fig. 3—Resistance to a humid atmosphere of a 100 per cent relative humidity at 100° F for 80.5 days



STEEL PLATE FABRICATION

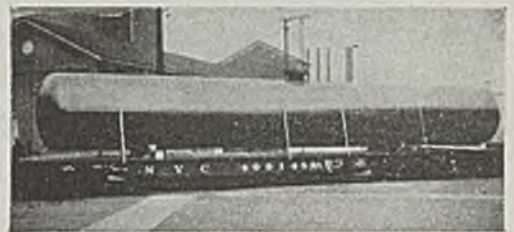


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General American Equipment has a long record of satisfactory service to many outstanding steel mills. Much of this equipment was precision fabricated from specifications submitted by steel mill engineers, and some was designed, fabricated and installed by General American to meet performance requirements.

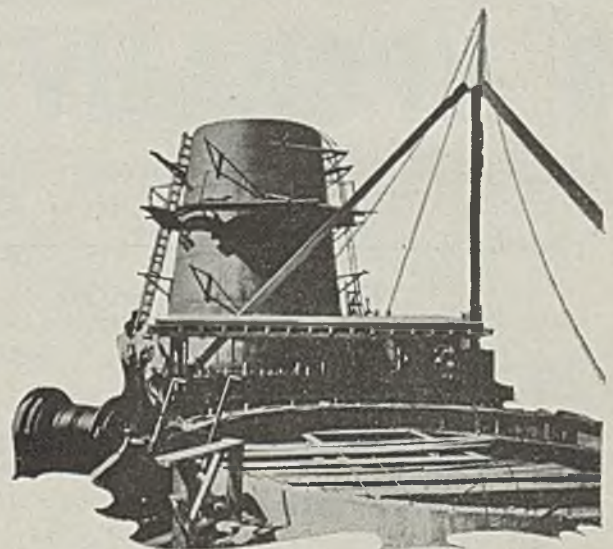
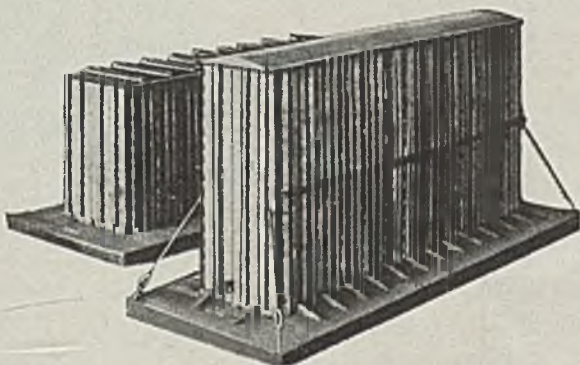
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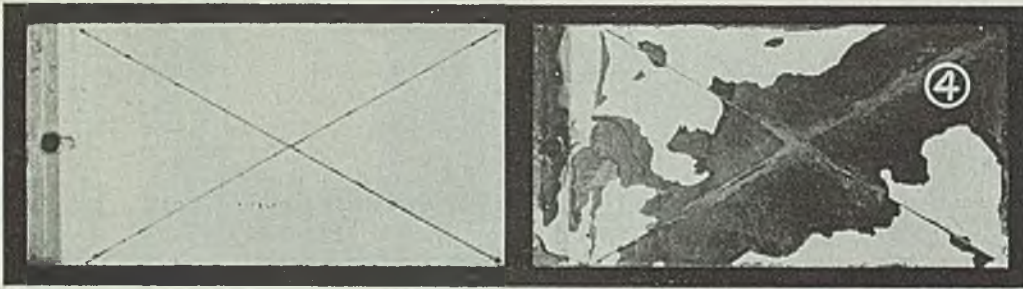


Fig. 4 — Painted steel panels after exposure to ASTM standard salt-fog corrosion test. Both panels were exposed for 300 hours at 95° F. Panel at left Banox treated; other panel received no treatment prior to painting

A more critical examination of the film with the aid of a microscope reveals it to be smooth and continuous.

While some glassy coatings are hard and brittle, Banox has unusual plasticity and can suffer great deformation without cracking. It is believed that this property is related to its amorphous or noncrystalline nature. The x-ray diffraction prints shown in Fig. 1 illustrate the structural difference between crystalline phosphate coatings and the amorphous coating. The orderly arrangement of atoms in crystalline materials (A) results in the diffraction of x-rays along definite paths which produce characteristic lines on the film. But the random arrangement of atoms in an amorphous material (B) results simply in the scattering of the x-rays and the pro-

duction of a haze rather than lines.

The film is not intended to be used as a permanent coating by itself, but rather as a means of greatly extending the life of organic finishes. Nevertheless, it possesses definite utility in affording steel temporary protection against rusting both in normal and high temperature atmospheres. Figs. 2 and 3 illustrate the protective value of these films on steel against two types of corrosion, and at the same time demonstrate two important properties of the film.

To protect against high temperature atmospheric oxidation, a film must act as a barrier to the diffusion of gases. Fig. 2 shows the efficiency of these films of various thicknesses in reducing the corrosion of steel kept in an oxidizing atmosphere for 1 hour at 600° C (1112° F). A coating weighing 15 mg/dm² (corresponding to a thickness of about 21 millionths of an inch) reduced corrosion 90 per cent.

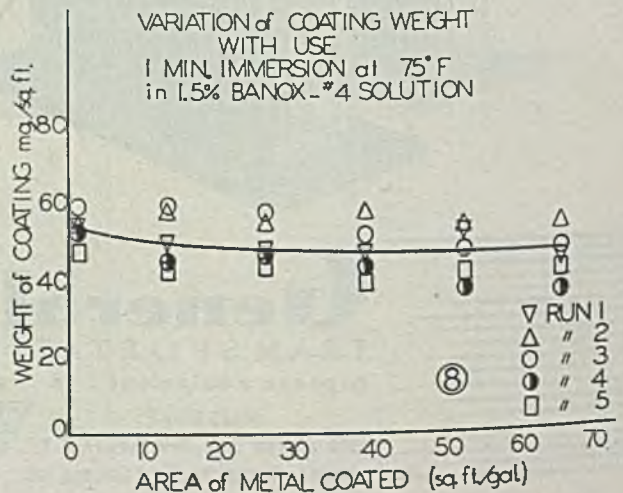
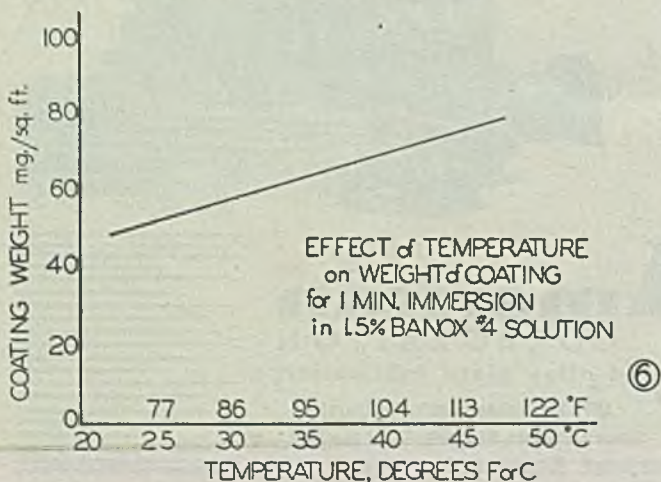
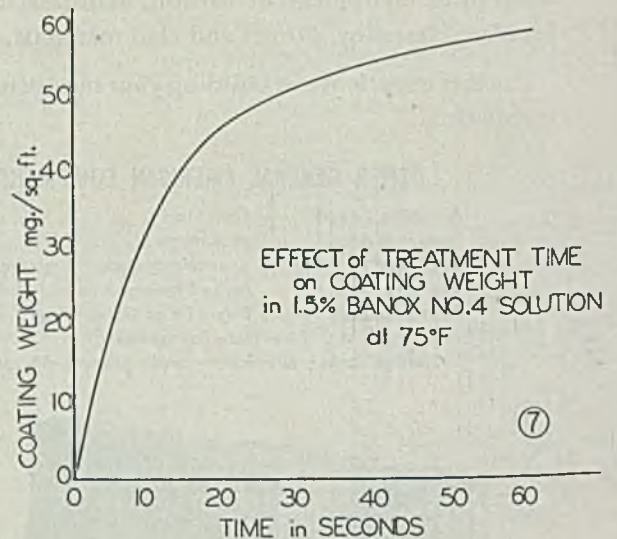
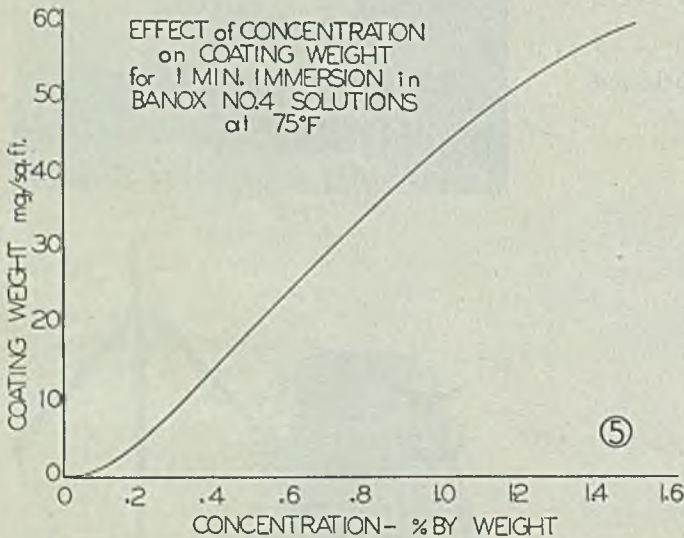
The type of attack suffered by steel in a humid atmosphere is electrochemical in

Fig. 5—Effect of concentration of solution on coating weight

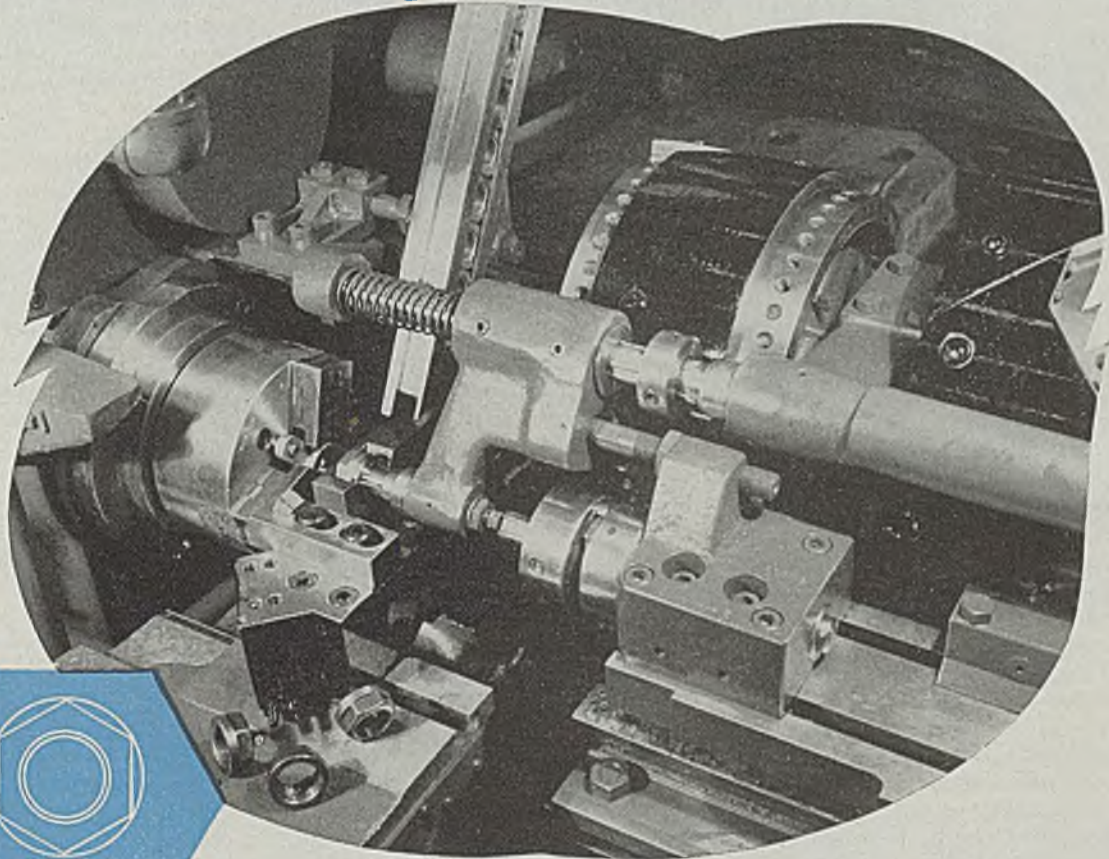
Fig. 6—Weight of coating as it is affected by temperature of solution

Fig. 7—Treatment time as it affects coating weight

Fig. 8—Variation of coating weight with use



High Speed Chucking Operation Automatically Loaded...



ACTUAL SIZE

Above shows largest and smallest of four types of nut blanks processed on this machine. Some are flanged, some plain. Simple changes adapt tools and fixtures. Carbide tools and high speeds and feeds help to deliver up to 135 nuts per hour.

On a CLEVELAND 1½" B

Magicians say . . . "the hand is quicker than the eye" . . . but for chucking finish operations on cast-iron hex nut blanks this set-up on a Cleveland Automatic is quicker than the hand, and more productive. This job is worked with carbide tools at fast spindle speeds and delivers up to 135 nuts per hour.

A bar type magazine carries the cored blanks . . . A cradle actuated by the rear cross-slide advances to center with one blank . . . Conveyor finger on stop gauge fixture, actuated by milling slide forward and return motion, swings down and withdraws blank from cradle, which then pulls back for reload . . . Milling slide approaches chuck, causing conveyor finger to insert blank in rotating jaws . . . Precisely timed air valves, operated from camshaft, close chuck and conveyor withdraws . . . Cross slide turning attachment drills, ID to work size, broadfaces and chamfers ID and OD . . . Milling slide handles tapping and withdrawal at carbide working feed . . . Air operated chuck opens and ejector spring, loaded by insertion of blank, ejects finished nut.

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nature as contrasted to the direct chemical attack suffered at high temperatures. Ability of the Banox film alone to inhibit corrosion in a humid atmosphere, shown in Fig. 3, is ascribed not only to its function as a vapor barrier, but also to the high electrical resistance of the coating which inhibits the formation of local corrosion cells. The sort of corrosion protection offered by the coatings alone is entirely adequate for the temporary protection of steel and will inhibit corrosion for several months in plant atmospheres. This is of value when fabricated parts are temporarily stored prior to finishing, and also when steel sheets and coils are coated in the mill.

A Base for Paint: Organic finishes vary in their permeability to moisture and gases, but none can prevent these corrosive agents from penetrating to the metal surface. The damage which results depends upon the resistance of the base metal to the medium attacking it. The surface of stainless steel, for example, normally has an exceedingly thin, highly impermeable and self-healing coating which offers great resistance to many corrosive environments. But ordinary steel possesses an oxide coating which is permeable and which falls easy prey to corrosive agents in the atmosphere. The electrochemical nature of this type of corrosion is well substantiated. Because of local differences at the surface of the metal, galvanic cells are created which lead to the solution of iron at one pole and the production of hydrogen gas and hydroxyl ion at the other. With these events occurring beneath the paint film, failure is inevitable: The formation of rust and hydrogen gas

results in blistering, and the alkali formed acts as an excellent paint stripper. How can such a film—5 to 20 millionths of an inch thick—alter these events?

A crystalline film is deposited on a metal surface in random fashion. In order to make difficult the penetration of the corroding agents, it must be relatively thick. The Banox film, on the other hand, forms a continuous coating. Very thin films are therefore capable of greatly diminishing the rate at which the corrosive environment reaches the metal. And when there is direct access to the metal, such as through scratches, it localizes corrosion. By serving as an insulator, it prevents functioning of the potential galvanic corrosion cells.

Fig. 4 shows the effect of the coating on the salt-fog durability of a typical baked synthetic enamel. Both steel panels were given identical treatment, except the panel at the top was Banox coated before painting. The panels were exposed at the same time for 300 hours in a salt-fog cabinet in accordance with the ASTM method. Although the untreated panel was given careful laboratory preparation to insure a chemically and physically clean surface, corrosion has almost totally destroyed paint adherence. Paint on the Banox-treated panel is tightly adherent right up to the scratch marks and has not become softened to any measurable extent.

Adherence and Flexibility: A unique property of the amorphous coating is that while technically it is a glass, it possesses remarkable plasticity. Metal may be formed and mildly drawn without damage to the film. This property

of the coating is of great value in those cases where metal is formed or drawn after the application of organic finishes, such as in the manufacture of general line cans and bottle caps.

Some questions concerning adherence in general and in relation to surface conversion coatings need clarification. It has been demonstrated by some students of the problem that the initial adhesion of some synthetic coatings to highly polished chemically and physically clean metal surfaces may be greater than the tensile strength of the metal. In this case, there is no mechanical "keying" of the coating. Adherence resides in the more powerful chemical forces of attraction between the paint film and metal surface. While initial adherence to such specially prepared surfaces may be high, the effects of corrosion soon destroy the bond.

The vitreous phosphate film largely takes on the surface contour of the metal to which it is applied. Coatings on polished steel are smooth. Since even in this case adhesion is great, it must be attributed to chemical forces of attraction. A point to be emphasized is that corrosive environments have but little effect; the adhesion of organic coatings applied over Banox remains high in all tests.

Plant Use: Banox No. 4 is a dry, powdered material which serves both as make-up chemical and replenisher. Solutions are prepared simply by dissolving the required amount of dry compound in cold tap water. The solution is used unheated; and any means of bringing it into contact with clean metal (such as immersion, spraying, brushing, etc.) is sufficient for coating production.

The solution coating rate may be altered to fit production lines of varying speeds. The rate at which coatings are deposited depends upon the temperature and concentration of the solution. Fig. 5 is a graph showing the change of coating rate with concentration for 1 min immersion at room temperature (75° F). Since coatings weighing between 25 and 75 mg per square foot of surface perform about equally well under paint, there is wide latitude in choice of working concentration. But since more concentrated solutions, 1 to 2 per cent, require less frequent replenishment, the most generally useful concentration is about 1.5 per cent.

While temperature increases the rate of coating deposition as shown in Fig. 6, it is not desirable to heat the solution beyond about 120° F., since higher temperatures shorten its useful life. It is by far more economical to operate the solution cold; not only may heating costs be eliminated, but in new

NEW LITERATURE

ELECTRICAL LIVING

By Westinghouse Electric Corp., 306 Fourth avenue, Pittsburgh 30. A 40-page booklet (B-3560) illustrated in color with scenes from the Walt Disney production "The Dawn of Better Living". Price 10 cents available from distributors.

MECHANICAL PACKINGS MANUAL

By Graton & Knight Co., 356 Franklin street, Worcester 4, Mass. A 336-page leather book, price \$4.50.

CONE-DRIVE GEAR SETS

By Michigan Tool Co., 7171 East McNichols road, Detroit 12. A 16-page illustrated catalog No. 700.

BUFFS, WHEELS, COMPOSITIONS

By Udylite Corp., 1653 East Grand boulevard, Detroit 11. A 6-page illustrated folder.

TOOL BITS

By Vanadium-Alloys Steel Co., Latrobe, Pa. A 9-page booklet on Lamite cast alloy cutting and grinding tools.

REVERSIBLE PLUG GAGES

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SAFETY WEDGE GRIP LETTER AND FIGURE STAMPS — INTERCHANGEABLE STEEL TYPE HOLDERS

By M. E. Cunningham Co., 172 East Carson street, Pittsburgh 19. Illustrated bulletin WG-462.

SPECIAL SHAPED WOOD TANKS

By Acme Tank Mfg. Co., 5402 South Soto street, Los Angeles 11, Bulletin gives engineering data and illustrates a variety of special shaped wood tanks.

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By Wickwire Spencer Steel, 500 Fifth avenue, New York 18. Folder describing decorative perforated metal.

COMBUSTIBLE GAS ALARM SYSTEM

By Davis Emergency Equipment Co. Inc., 45 Halleck street, Newark 4, N. J. An 8-page illustrated bulletin No. 1118 E.

STANDARD FLASH WELDERS

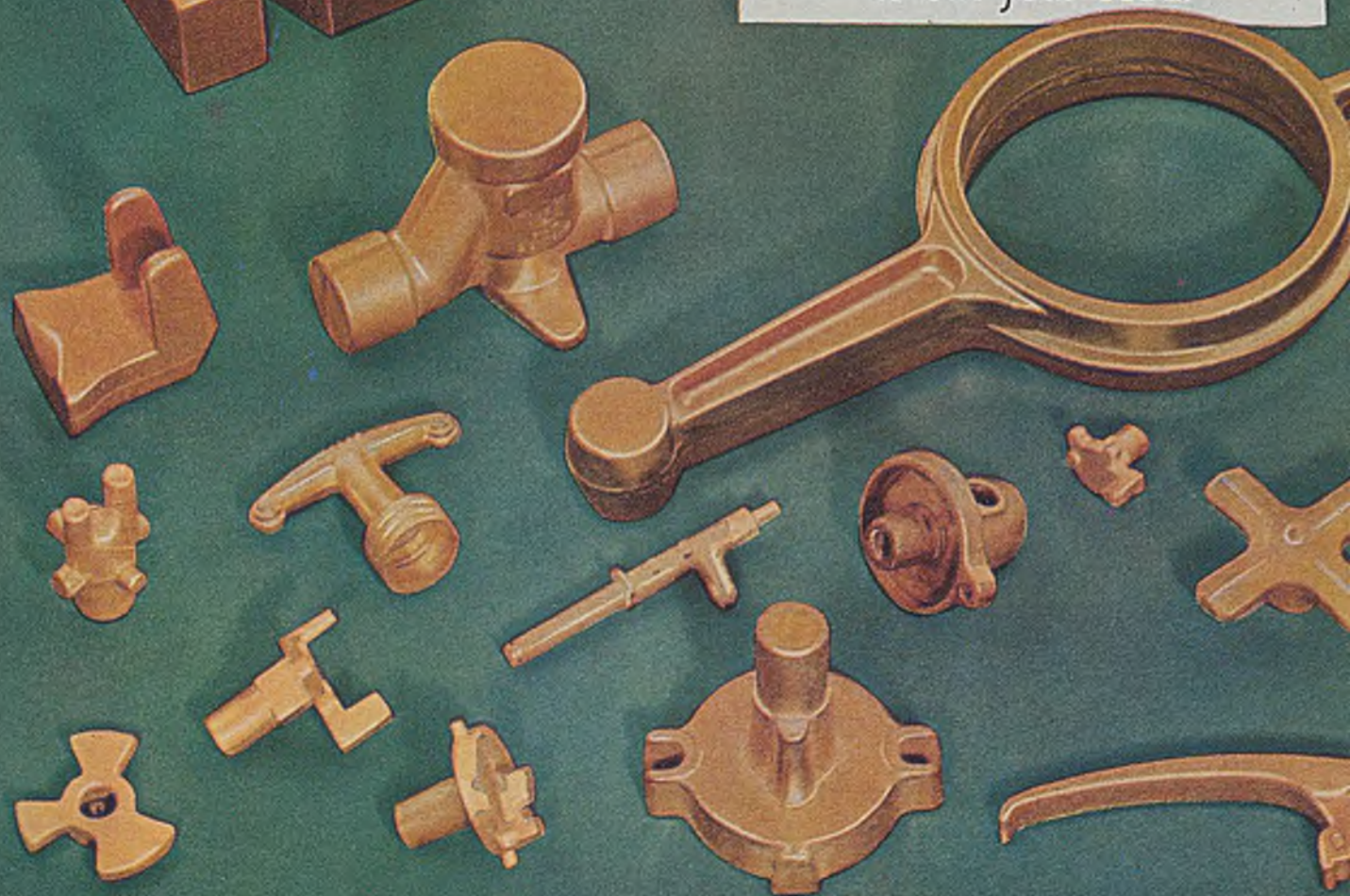
By Progressive Welder Co., 3050 East Outer drive, Detroit 12. An 8-page technical and descriptive bulletin.

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installations no heating equipment need be provided.

Increasing treatment time likewise increases the weight of coating. This effect is graphed in Fig. 7, from which it will be noted that most of the coating is deposited in the first few seconds time.

Control and Replenishment: The composition of dry Banox No. 4 is so adjusted that coating materials are removed from its aqueous solutions in the same proportion as they were originally present. This makes replenishment extremely simple: When the concentration falls to some predetermined point, all that is required is addition of enough dry compound to restore the initial concentration. Since relatively slight changes in concentration do not appreciably alter the coating power of the solution, excellent uniformity is achieved. This is illustrated in Fig. 8 for a 1.5 per cent solution operated at room temperature in which steel panels were treated by immersion for 1 min. Sixty-five square feet of metal surface per gallon of solution were processed each day for a period of 5 days. The solution was replenished daily to compensate for the decrease in concentration, which amounted to about 12.5 per cent for each 65 ft processed per gallon of solution. Fig. 8 shows the uniformity throughout the day's run as well as from one day to the next.

Two principal methods are available for control of the Banox solution. For most precise operation, a rapid, simple chemical test may be used. A rougher method is to determine the actual coating power by weighing test panels before and after treatment or before and

after stripping. When the coating weight falls to a predetermined value, sufficient compound is added to compensate for the loss. In this manner a schedule of additions may be worked out requiring but infrequent checking.

Production Use

Degreasing the Metal: If the treatment imposes any burden upon the user, it is one common to good paint practice in general: The metal surface must be clean. This means freedom from rust, mill scale, dirt, oil and grease. In most fabricating plants, the first two requirements are not a problem. Those remaining are solved by the conventional methods: Alkaline, emulsion, vapor or solvent degreasing. If clean metal is to be treated, this step is omitted.

When alkaline degreasing is used, it must be followed by a water rinse. If heavy rust or mill scale is present, degreasing should be followed by pickling and a clean water rinse to remove pickling liquor.

Coating: The solution is prepared by dissolving the required amount of dry compound, usually 1 to 2 oz per gallon, in cold water. Since the solution is noncorrosive, ordinary steel tanks may be used. Whether applied by spray or immersion processes, it is used at room temperature. Treatment time may be from 10 to 60 sec or longer, depending upon the desired time cycle.

Chemical Rinse: Following Banox it is desirable but not necessary to provide a clean water rinse to extend the useful life of the chemical rinse. This stage consists of a 0.05 to 0.10 per cent dichromate solution heated to about 150° F. The time required in

the final rinse is from 10 to 30 sec.

Drying: The final step is to dry the film. Forced hot air, infra-red lamps, ovens, or other suitable methods may be used.

Economic Considerations: The coating efficiency of such solutions as those described is remarkably high. Depending upon plant conditions and care exercised in operation, 1000 to 4500 sq ft of metal surface may be coated per pound of Banox. In small quantity purchases, this corresponds to a chemical cost of about 0.023 to about 0.005 cents per square foot of surface.

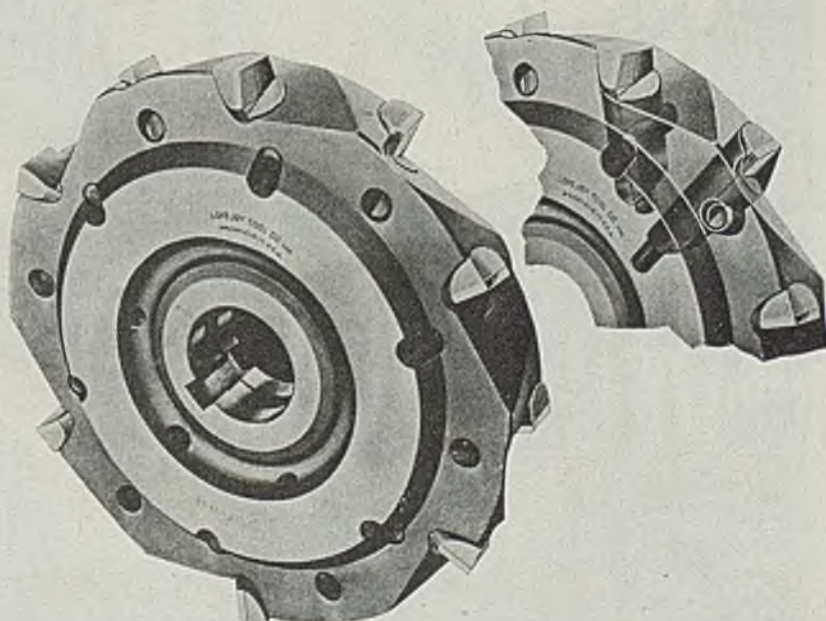
After operation of the solution for several weeks or several months, it may be found desirable to discard it and begin with a fresh bath. Since the estimated cost given was figured on the assumption this would be done, it can be seen that accidental contamination or process difficulties which require dumping the bath involve negligible loss.

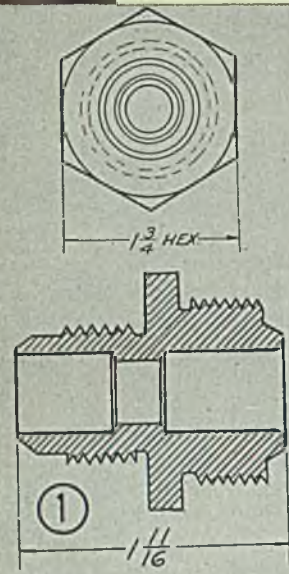
Equipment maintenance is at a minimum. Since the solution is not corrosive, leaky tanks and the replacement of tanks and spray nozzles need not be considered. For the same reason, cleaning the tank or spray nozzles is extremely simple. While a soft sediment may form on the sides and bottoms of the tank, no hard scale develops. The sediment is removed simply by flushing with a hose. Since it is operated cold, heating coils offer no cleaning problem.

To finishers, another consideration should prove interesting. As these coatings are smooth, the gloss and surface texture of thin paint films are not impaired.

SIMPLIFIED ADJUSTMENT:

Addition of screw adjustment to blade positive-locking device of slotting cutter made by Lovejoy Tool Co. Inc., Springfield, Vt., provides sensitive control of blade settings. Blade, set at angle to cutter body, is adjusted by unseating taper pin to loosen positive-locking device. Recessed screw head at bottom of blade then is turned to draw up or retract blade. Cutter blades have extra-large carbide inserts





Nonferrous

Forgings

By CARL H. PIHL
 Assistant to the Secretary
 Copper and Brass Research Association
 New York

Copper and aluminum alloys available for die-pressed or hammered forgings exhibit full range of mechanical properties. Using slugs from ingots or rods, method economically produces irregularly shaped parts



STEADILY increasing in scope and diversity of application, nonferrous forgings are continuing to provide satisfactory solutions to many difficult engineering and production problems confronting American industry today.

In achieving the tremendous production rate which furnished the tools for victory in World War II, industry relied to an unprecedented extent upon nonferrous forgings for numerous purposes. In the belief that many of these applications may prove equally beneficial in completing reconversion to peacetime production, there are presented herein the latest developments in this field and an explanation of the vital role of these forgings in construction of war materials.

First, it might be well to define the term "nonferrous forging", and explain briefly the development of this method of working brass and other nonferrous metals. Nonferrous forgings are metal shapes produced by hot-working nonferrous metals, subjecting them to hammering and pressing operations. The result is the compression, bending, twisting, indenting or extrusion of the metal so that various parts of the forging are formed by pressure against dies.

When prehistoric man discovered copper, he eventually learned to hammer the metal, by cold-working, into useful weapons and implements. Progress was slow and measured by centuries, but there are records extant which reveal that in 5500 BC the Egyptians were hot-forging copper and bronze by primitive hand methods. Centuries later the Etruscans developed into expert artificers of bronze for chariot plates, horses' bits and similar articles by hot forging. Some of these beautiful hand-forged bronzes, are on exhibit at the Metropolitan Museum of Art in New York City. While the American Indian hammered copper into arrowheads, spearheads and other implements, by cold working, the first hot forging in the New World probably was done by an unknown blacksmith who accompanied an early explorer.

Previous to World War I there is no information of any company making a great number of forgings from nonferrous metals. According to available records the first machine forging of brass was made during the early part of World War I and this method of fabrication, after a brief period of expansion, lapsed into apparent obscurity again. When American industry girded for production for World War II, the utilization of brass and aluminum forgings skyrocketed to new heights. Growth in the production of these forgings jumped suddenly in 1941 and continued to increase during the war years. In 1945, for instance, the tonnage of copper, brass and bronze forgings produced was five times the average for the 5-year period, 1935 to 1939.

Some hundred or more basic industries in this country have found important uses for nonferrous forgings. Die-pressed or hammered forgings offer an efficient

Fig. 1—Simple threaded part converted to forging at considerable savings in costs and time
 Fig. 2—Brass forging used as coolant pump impeller on heavy bomber engines. Photos from The Brass Forging Association, New York
 Fig. 3—Front half of brass forging

used for valve part for equipment on seven-man AAF life raft
 Fig. 4—Back half of valve shown in Fig. 3
 Fig. 5—Torpedo forging made of naval brass
 Fig. 6—Forged aluminum alloy artillery fuse

TABLE I
DATA ON COPPER ALLOYS COMMONLY USED FOR FORGINGS

Alloy	Composition (Commercial Limits-%)	Density (Lb. per Cu. In.)	Tensile Strength (1" Loft) (Lbs. per Sq. In.)	Elongation in 2 In. (Per Cent)	Rockwell Hardness	Best Annealing Temp. °F
Forging Brass	Copper 60. Lead 2. Zinc 38.	.305	52,000	45	F78	800-1100
Naval Brass	Copper 60. Tin 0.75 Zinc 39.25	.304	57,000	47	B55	800-1100
Leaded Naval Brass	Copper 60. Lead 1.75 Tin 0.75 Zinc 37.5	.305	57,000	40	B55	800-1100
Manganese Bronze	Copper 58.5 Iron 1.0 Tin 1.0 Zinc 39.2 Manganese 0.3	.302	65,000	33	B65	800-1100
Muntz Metal	Copper 60. Zinc 40.	.303	54,000	50	F80	800-1100
Silicon Bronze, Type A	Copper 94.8 Min. Silicon 3.0	.308	58,000	60	B60	900-1300
Silicon Bronze, Type B	Copper 96.0 Min. Silicon 1.5	3.16	40,000	50	F55	900-1250

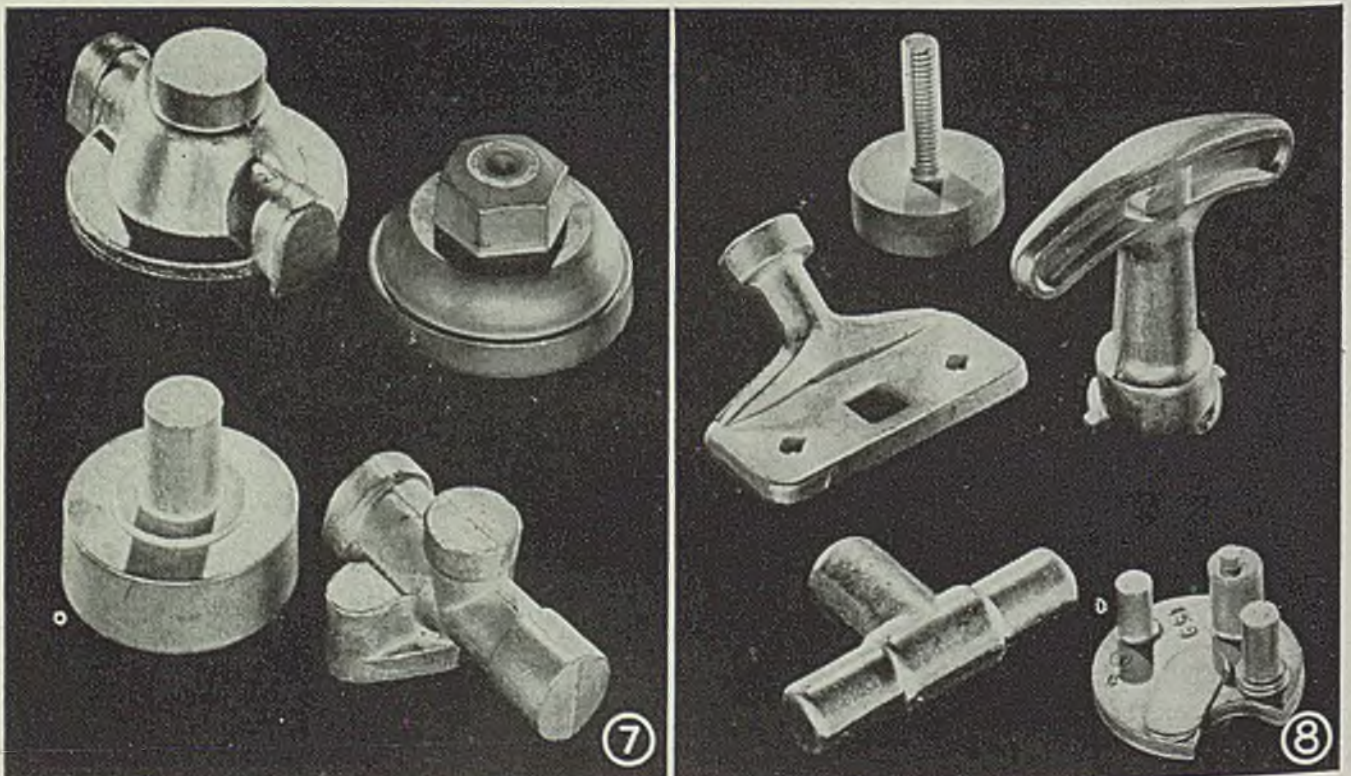
and economical method of producing irregularly-shaped metal parts from slugs cut from ingots or rods. The result is a strong, dense metal part, closely resembling the shape and size of the finished product, thus insuring a minimum of scrap metal in the final processing operations. Such forgings are furnished either cleaned, trimmed, pierced, sized or otherwise freed of excess material and

are ready for machining or further finishing or fabricating operations. They also may be furnished as the finished or machined forging completely processed, ready for use by itself, such as a nut or tee, or as an item for incorporation in an assembly, such as automobile hardware.

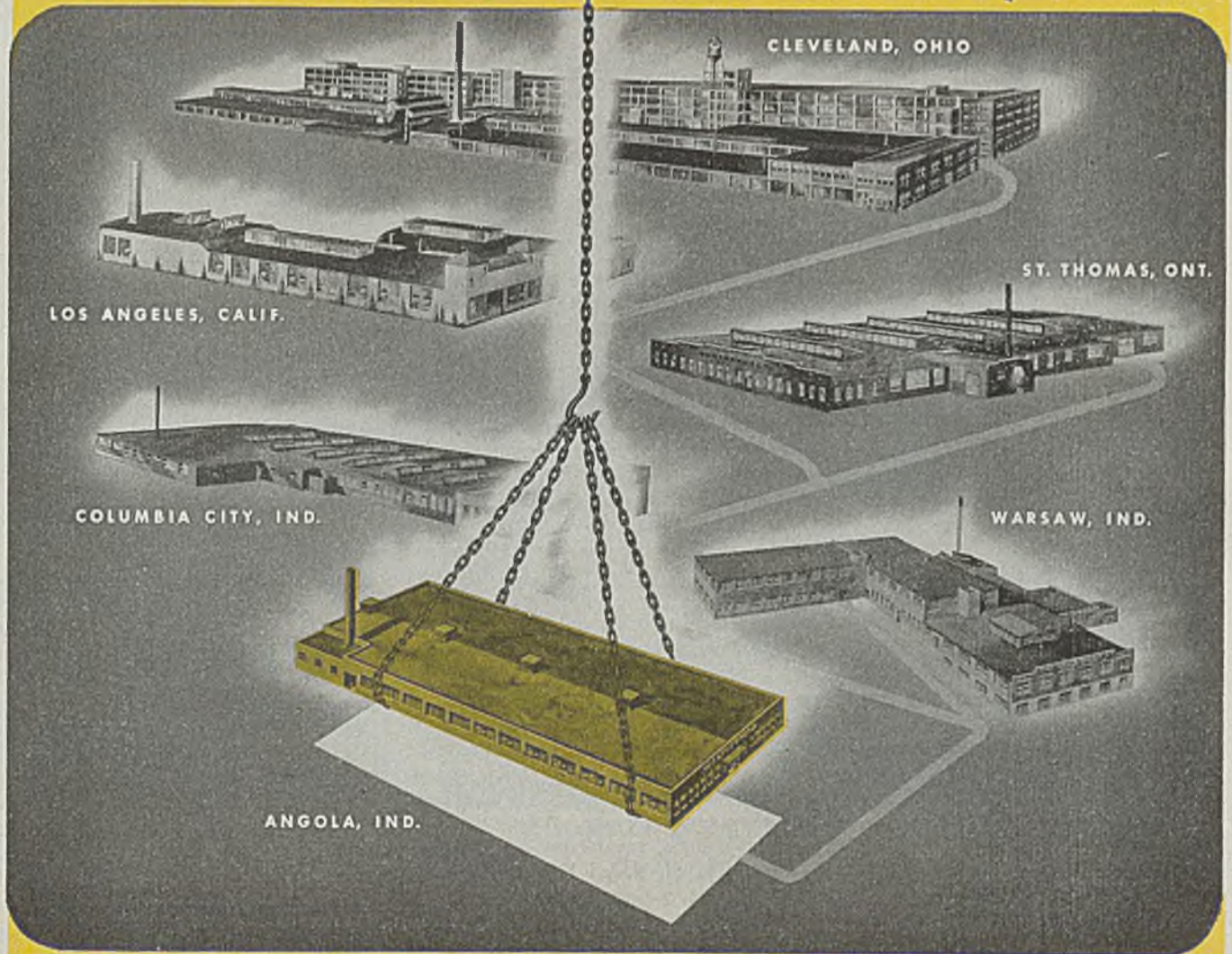
Grain structure is uniform and dense, eliminating the disadvantages of porosity and rough surface finish. Nonferrous forgings also have high tensile strengths—the great strength and nonporosity often permitting reduction in weight of parts previously produced by other processes. Because of the accuracy and smooth finish of these forgings, fewer finishing operations are necessary, and the required machining may be performed with maximum speed, due to free-turning qualities of nonferrous alloys and the absence of grit and chilled areas. However, higher strength naturally sacrifices some machineability. Re-

Fig. 7—(Upper left and lower right) Refrigeration forgings; (upper right) a flush valve cap; (lower left) a flush valve forging

Fig. 8—Elevator contact, window washer's anchor and other forged brass articles demonstrate potentialities of this medium for civilian product components of irregular shape



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TABLE II
DATA ON ALUMINUM ALLOYS COMMONLY USED FOR FORGINGS

Alloy Symbol*	Mechanical Properties					Nominal Chemical Composition				
	Minimum Specification Values					Per Cent of Alloying Elements; Balance Aluminum				
	Yield Strength (Set=0.2%) Lbs./Sq. In.	Ultimate Strength Lbs./Sq. In.	Elongation Per Cent in 2 Inches	Tension		Density Lb. Per Cu. In.	Copper	Silicon	Manganese	Magnesium
				500 KG Load	10 MM Ball					
2 S-H	21,000	24,000	15	44	.098	0	0	0	0	
14 S-T	55,000	65,000	10	125	.101	4.4	0.8	0.8	0.4	
17 S-T	30,000	55,000	18	100	.101	4.0	0	0.5	0.5	
18 S-T	40,000	55,000	10	100	.103	4.0	0	0	0.5	
25 S-T	30,000	55,000	16	100	.101	4.5	0.8	0.8	0	
32 S-T†	40,000	52,000	5	115	.097	0.9	12.5	0	1.0	
A 51-ST†	34,000	44,000	12	90	.097	0	1.0	0	0.6	
53 S-T†	30,000	38,000	14	75	.097	0	0.7	0	1.3	

* S—Signifies wrought alloys.
H—Signifies completely cold worked.
T—Signifies completely heat treated.

† 32 S-T contains 0.9 nickel and A 51-ST and 53-S-T each contain 0.25 chromium.

tarded machine speed, dulling of cutting tools, excess scrap waste metal and rejections are almost precluded and reductions of 45 per cent in machining costs are not unusual. The superior characteristics of nonferrous forgings, the wide range in the shapes which are practicable and the overall economy which they afford have made them increasingly favored for many uses.

Now that the rigid censorship has been lifted, it is possible to reveal some of the manifold uses of these forgings in the production of war materials for the Army, Navy and Air Forces. Performance of these forgings in our fighting ships, planes, tanks and other war equipment proved their reliability.

A brass forging was used successfully as an ignition harness for the ignition system on the engine of the P-47 fighter plane known as the Thunderbolt. Another brass forging, Fig. 2, was used as the coolant pump impeller on heavy bomber engines. Among the other uses on aircraft for brass and aluminum forgings are a variety of sockets, valve bodies and parts, flanges, gages, diaphragm cases, nozzles and miscellaneous nuts and bolts.

Brass forgings had a vital role as oxygen cylinder valves in the oxygen apparatus used by high altitude fighters and bombers. Another brass forging, shown in front and back view, Figs. 3 and 4, respectively became part of the valve assembly on life rafts used by airmen shot down over the sea. Brass forgings were used for oil gages, carburetor parts and other fittings on Army trucks, jeeps and vehicles in general. Tanks and machine guns, artillery pieces, landing craft and battleships all had vital parts which were nonferrous forgings.

Literally millions of fuses and ammunition components for artillery shells and rockets of all calibers were produced by forging brass, aluminum and other nonferrous metals. Forging produced fuses to the close tolerances required, eliminated porosity, saved time and re-

duced waste scrap; and proved more efficient and effective than similar parts made by other methods. Note density and fine finish of forged aluminum alloy artillery fuse in Fig. 6. Brass and aluminum forgings were included in the equipment for the Manhattan project which produced the atomic bomb. Nonferrous forgings were found in radio and radar equipment, various instruments and fire extinguishers used by the services.

Nonferrous Forgings Reduce Cost

There is a good possibility that design engineers and production men of many industries will find in nonferrous forgings the answer to a specific problem, leading to improvement of their product and at the same time reducing production cost. Many nonferrous alloys are readily adaptable to the forging process and have been successfully used. Among them are forging brass, naval brass, nickel silver, muntz metal, leaded brasses, aluminum bronze, manganese bronze, silicon bronze and several aluminum alloys. Table I presents data on seven general types of copper alloys commonly used for forgings, while Table II presents similar data covering composition and mechanical properties of aluminum forging alloys.

An example of the savings which are possible through use of nonferrous forgings is the part sketched in Fig. 1. This is a simple threaded part which was formerly made from 1½ in. hexagon high-speed rod. This required 1580 lb of hexagon rod, and at \$0.1492 per pound, the cost of material was \$235.74. By making this part as a forging from round stock, or rod, only 932 lb of material were required at \$0.1376 per pound for a total cost of \$128.24. In addition to the saving of \$107.50 for material, there was a saving in labor cost, making a total saving of approximately 3 cents per piece by producing this part by the forging method.

For certain complicated shapes, like that of the naval brass torpedo forging in Fig. 5, there is no doubt that forgings

can be produced more efficiently and economically than by any other fabricating method.

At present nonferrous forgings are used extensively by manufacturers in many diversified fields, such as hardware, automotive, electrical, chemical, plumbing and welding. Brass forgings have an important part in acetylene burners, air compressors, blow torches, beer dispensing equipment, compressed gas valves and fittings, fire extinguishers, pressure gages, gas and water meters, oil burner equipment, turnbuckles and parking meters. They are also found in bathroom fixtures, cameras, casket hardware, dental and surgical instruments, keys, musical instruments, household appliances, farm implements, luggage and soda fountain equipment. See Figs. 7 and 8.

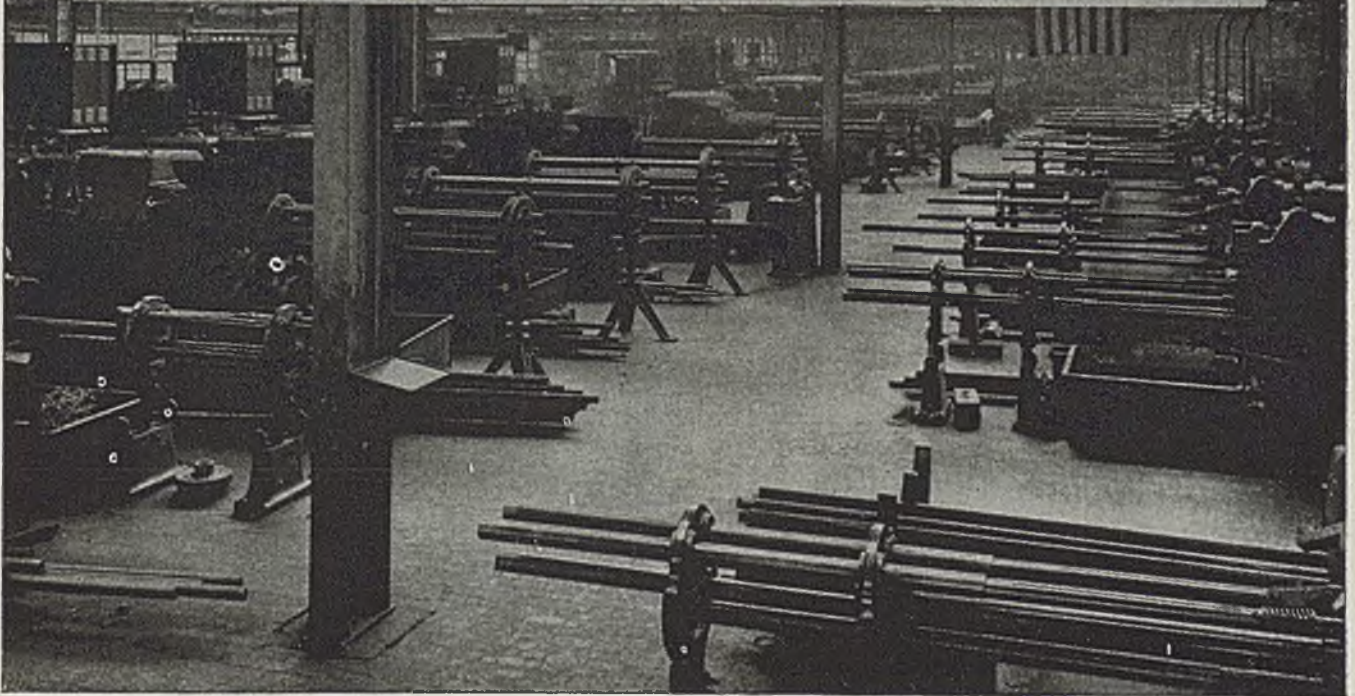
Nonferrous forgings can be provided in a great variety of finishes, including pickled, bright-dipped, satin, bright polished, lead dipped and plated with nickel, chromium, copper or other metals.

Forgings have definitely proved their worth in the production of specific parts, especially irregularly-shaped parts, for war materials. They have resulted in savings of time and material, hence their unit cost has been less. And in most cases, forgings have had the physical properties desired.

Stress Analysis Pamphlet Offered

An eight-page folder entitled "Photoelastic Stress Analysis" is offered free of charge by Sales Service Division of Eastman Kodak Co., Rochester, N. Y. Published to provide engineers and scientific investigators with a survey of photographic aspects of stress analysis, the pamphlet covers such subjects as optical theory, apparatus, the model, photographic materials, analysis of records obtained and three-dimensional analysis.

In the World's Largest Proving Ground for Mechanical Tubing



... we learned to tailor the tube to the job. Pictured above is only part of the 600 screw machines in the huge plants of The Timken Roller Bearing Company.

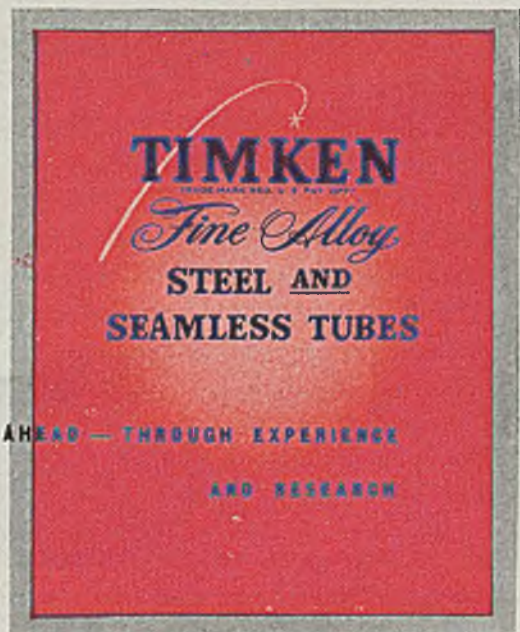
Here, every year, millions of feet of Timken Alloy Steel Seamless Tubing with a wide variety of wall thicknesses is machined to form cones and cups for Timken Roller Bearings in sizes from $1\frac{1}{4}$ inch O.D. to 10 inch O.D.

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were shaped
like this...
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10-ton Steam Hammer
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A steam-operated, all-metal hammer was still a bit of an innovation in 1874 . . . but not for Standard Steel. A ten-ton, double-acting model, imported from England, had already been turning out quality forgings for American industry for six years.

Standard's capacity has grown with demand . . . and today the forge shop has a yearly output of about 15,000 tons of locomotive forgings from the 14 steam hammers and lighter steam hydraulic presses, and 30,000 tons of heavier miscellaneous forgings from the heavier presses. All phases of the heating and mechanical working of ingots into forgings has been developed to a high degree of perfection, through careful and continuing study and research. These painstaking methods pay valuable dividends in service. When you need

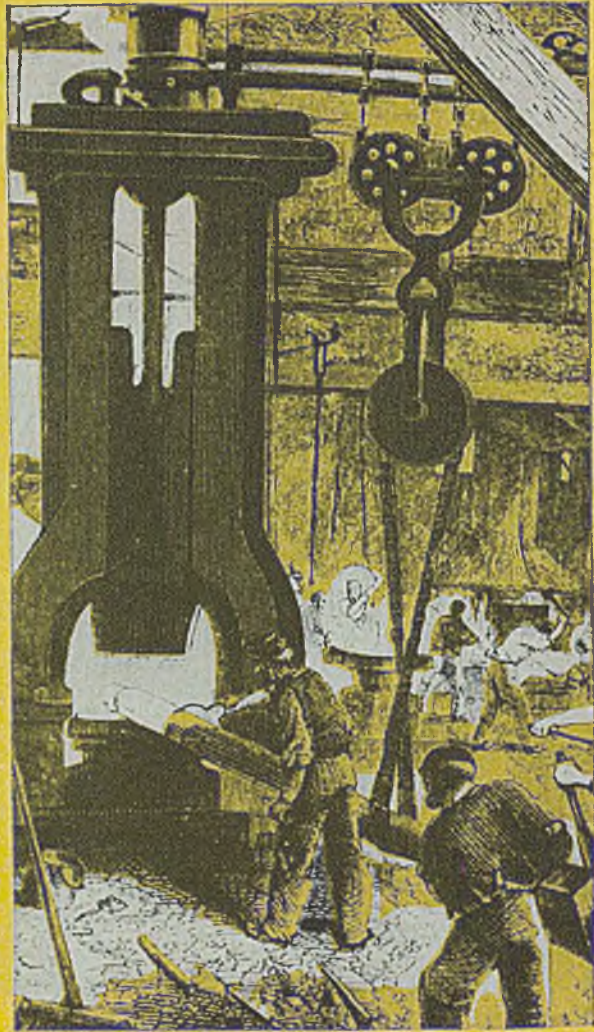


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FROM A METAL MAKER'S "FAMILY ALBUM"

forgings, you'll find that an excellent way to simplify your buying is to "Standardize on Standard."



BALDWIN
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"STANDARDIZE ON STANDARD" FOR YOUR FORGINGS AND CASTINGS

Photometric Analysis

(Continued from Page 111)

Basis for computing results can therefore be made of the Bouguer-Beer law as shown by the work of Drs. Sheard and Sanford who state that the relationship expressed by the law holds sufficiently well to permit chemical analysis with high sensitivity and accuracy, even when a wide spectral band, selected by means of a light filter, is used.

A somewhat modified version of the Beer-Bouguer law used in calculating the concentration is:

$$I/I_0 = 10^{-kcl} \quad (1)$$

where I_0 is the intensity of the incident light; I the intensity of transmitted light; k a constant (specific extinction) whose value for specified units depends upon the solvent and temperature as well as upon the wavelength of the light used; c equals the concentration of the colored substance; and, l is the depth of solution traversed by the light. Equation (1) may be written:

$$kcl = -\log_{10}(I/I_0)$$

or, after changing the signs

$$kcl = \log_{10}(I_0/I) \quad (2)$$

Since the intensity, I_0 , is adjusted to bring the reading to exactly 100 on the scale before introduction of the test solution, the scale reading corresponding to the light intensity, I , is the transmittancy for the particular concentration, expressed in per cent. Therefore, using absorption cells of constant thickness, equation (2) reduces to

$$kcl = \log_{10}(100/P) \quad (3)$$

Where P is the photometer reading.

Dividing both sides of the equation by kl , equation (3) may then be expressed as

$$c = \frac{\log_{10}(100/P)}{kl}$$

The approximate semi-logarithmic relationship that exists between concentration and photometer reading makes the use of semi-log paper a great convenience in plotting the resulting analytical curves. Known concentrations of solution are plotted as ordinates on the equal-division axis against the readings as abscissas on the logarithmic scale. Typical curves are shown in the accompanying graphs.

Procedure used in the operation of the unit is essentially as follows: The absorption cells are placed in a sliding carriage which is movable at right angles to the path of the light beam and is placed between lamp and photocell. A suitable filter is positioned in front of the photocell, and two, parallel-walled absorption cells are respectively filled with the test or sample solution and the

blank or reference solution (either water or reagent solution). These are placed next to each other in the carriage, with the reference cell in front of the photocell. Light is then switched on, the microammeter put into the circuit, and the iris diaphragm between the light source and reference cell is adjusted so that the microammeter reads approximately 100.

This first reading decreases quite rapidly at first, but after a few minutes the ammeter indicator becomes quite stationary. Careful diaphragmatic adjustment is made so that the meter reads 100.0 (corresponding to 100 per cent transmission); carriage is then quickly moved to bring the colored solution in front of the photocell, and the microammeter is read immediately. Value indicated on the meter is the percentage transmittancy.

Readings Can Be Repeated

Readings can be repeated as many times as required to check the accuracy in which case the reference solution transmittancy is adjusted to 100 each time. It is possible, if the line voltage does not fluctuate too greatly, to obtain reproducible readings to 0.2 scale division. It should be noted that under constant illumination the current given by the photocell slowly decreases, however, this change is sufficiently slow to cause no appreciable error if the reference and sample solutions are read within a few seconds of each other.

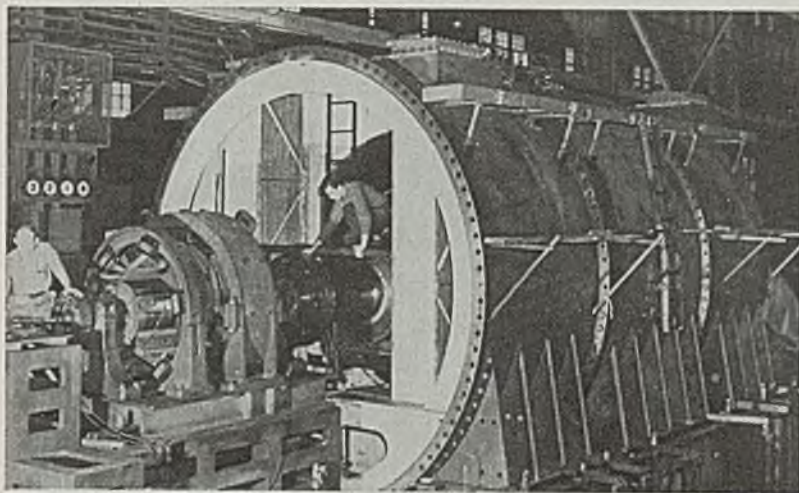
Applications of this instrument in the field of metallurgy are quite numerous.

It has been used in the analysis of such alloying constituents in steel as: Boron, chromium, cobalt, copper, manganese, molybdenum nickel, combined nitrogen, phosphorus, silicon, tin, titanium, tungsten, vanadium and zirconium. In non-ferrous laboratories it is being used for determinations of cobalt in copper-cobalt-chromium alloy, cobalt in tungsten-carbide, copper in aluminum alloy, copper in tin-base alloy, indium in the presence of lead, iron in any R_2O_3 , nickel in any alloy, etc.

Though many metals can not be determined directly in the solution, the long and tedious methods formerly required to make the preparatory separations of interfering metals for the gravimetric analysis methods have been largely eliminated. Solutions for the photometric technique can be prepared by using some colorimetric reagent such as dithizone (diphenylthiocarbazone), oxine (8-hydroxyquinoline) thiocyanate, etc.

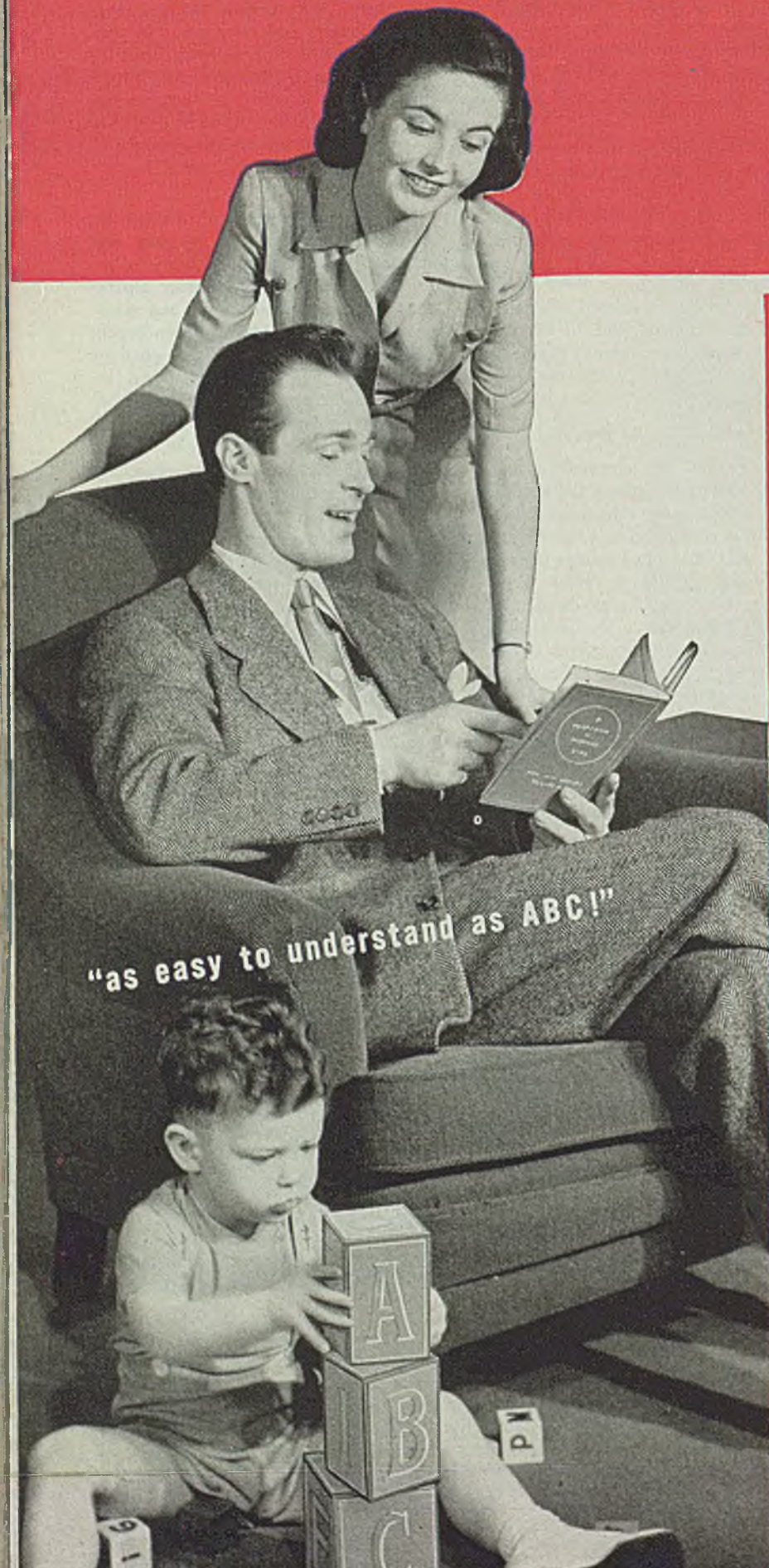
Dithizone has proven to be especially valuable for the detection and determination of traces of many heavy metals. It is said that the sensitivity of dithizone method approaches or equals that of the spectrographic methods; without this reagent the determination of traces of zinc and cadmium in complex materials would be extremely difficult. The use of colorimetric reagents is very aptly described by Dr. E. B. Sandell in his book, "Colorimetric Determinations of Traces of Metals".

Chemists working with steel are constantly striving to find ways to speed their determinations. One steel industry



SYNCHRONOUS CONDENSER: Shown here is a 12-pole, 60,000 kva synchronous condenser being built by Schenectady works of General Electric Co., for Southern California Edison Co. Coupled with a similar unit, the two units will be used initially as a frequency-changer set to convert 60 cycle power from Boulder Dam to 50 cycles for line use in California. Each machine utilizes hydrogen-cooling for the direct connected exciter. Fin-type gas coolers which remove heat losses are seen on either side of rotor shaft

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Without understanding, the buyer of insurance has no way of knowing which risks might result in financial loss, nor how great that loss might be. With understanding, he can judge whether he is fully covered by his insurance, or may even discover that he is carrying more insurance, at higher cost, than is actually necessary.

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Employers Mutuals are interested in lower insurance costs, because Employers Mutuals are wholly owned by policyholders and operated for the benefit of the policyholders.

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Employers Mutuals of Wausau, like most buyers of insurance, have always recognized the importance of understanding insurance because of the serious financial loss that may arise from lack of understanding.

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The first step in understanding any subject is knowing the exact meaning

of terms used to explain that subject. For the first time in the history of insurance, over 200 insurance terms have been brought together in one book. Legal phraseology, required to make the contract legally binding, is replaced by an explanation in simple, concise English, as easy to understand as A B C. The definition is followed by an example of a specific use of the term in insurance.

To spread the understanding of insurance even more widely, Employers Mutuals are preparing a series of advertisements, to appear in this magazine, which will feature definitions taken from the new Dictionary.

For Example, WHAT IS A "COMPREHENSIVE POLICY"?

Here is the definition from the new Dictionary of Insurance Terms:

Comprehensive Policy: An insurance policy which covers, under one insuring agreement, all hazards within the general scope of the policy, except those specifically excluded.

Example: A standard basic Automobile Liability Policy covers you against loss resulting from the use of certain specified automobiles. A "Comprehensive" Automobile Liability Policy covers you against claims which may result from the ownership, maintenance, or use of any automobile.

Perhaps, on the basis of this definition, it would pay you to look over your policies once more to see if you have the "comprehensive" coverage you should have.

The Employers Mutuals representative can give you a complete analysis of your present coverage. Such an analysis often reveals risks that are not covered. Many times it shows duplicate coverage that entails needless expense.

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A Dictionary of Insurance Terms

How to Understand Insurance and Buy It Intelligently

If you need the protection of insurance, you need to understand insurance in order to buy it intelligently. Here, for the first time in the history of insurance, is a clear, concise explanation of insurance terms in simple English as easy to understand as A B C. No legal phraseology. No "technical" language. Examples demonstrate the application of the terms to specific cases.

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laboratory is now running a composite determination of manganese, chromium, nickel, molybdenum and vanadium on the same sample without extraction of any of the elements. The entire determination is reported to require only 30 min and to be more accurate than the gravimetric or volumetric methods. Since photometric methods are faster and more accurate than gravimetric methods, many hours can be saved every day. Gravimetric determination of molybdenum in steel, for example, requires approximately 6 hours, the photometric method requires only 20 min and is accurate to 0.005 per cent in the range

of 0-0.7 per cent molybdenum.

Another metallurgical application of the instrument is in the determination of relative particle size and specific area of finely divided materials. Measurements for this particular application of the instrument are made by obtaining, on a predetermined time schedule, quantity of light transmitted through a narrow slit and through a suspension of the material in a liquid as the particles settle. Particle distribution and the specific area (total surface area of one gram of particles) may then be computed from the readings thus obtained. This method has been used on such materials as

abrasives, tungsten and tantalum carbides, and in powder metallurgy in general.

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Research Staff of Hopkin and Williams, *Organic Reagents for Metals and for Certain Acid Radicals*, Hopkin and Williams, London (1943).

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Honing

(Concluded from Page 112)

relatively large area cut-out interruptions in the bore.

Revised processing and new tooling recently have been adopted in most of the plants in this industry. Newly developed honing equipment is providing a large share of increased production and production control in these plants. It combines greater control of finer accuracy—from 0.00005-in. in some parts to 0.0001 or 0.0002-in. in others; uniform size within 0.0001 to 0.0003-in.; rapid stock removal by use of new abrasive developments and multiple spindle honing has given production rates ranging from 100 to 400 pieces per hour per machine and from 200 to 1000 pieces per set of stones. Surface finish ranging as desired from 1 or 2 to 5 or 6 micro-inches, profilometer reading is readily obtained.

The new honing machine tools being installed in these plants are arranged with multi-station, automatically indexed fixtures to hone two pieces at a time (multiple honing), or they may be operated to rough hone with one spindle and finish hone at the other spindle in progressive honing operation. Multiple spindle honing operation is dependent upon size control in order to equalize the finished result as related to form and dimensional variations in the bores as they come to the machine. This necessary size control, in turn, depends upon continuously and automatically gaging the bore during the honing cycle. These features are provided in the new equipment as a result of a newly developed method of mounting the honing abrasive stones in a plastic holder arranged with projecting end plastic tabs at each end of the stone, as shown in Fig. 1. These end tabs (but not the abrasive) enter a precision sizing ring at the same end of each alternate stroke. When the desired bore, or sizing ring size has been reached, frictional contact

between these tabs and the sizing ring surface turns the ring, tripping a microswitch which stops further stone expansion. The plastic mounting and tabs wear away as the stone wears down.

Spindles of these machines are arranged to control the rate of feed out of the abrasive or rate of stone expansion by means of a mechanical dial adjustment and also to automatically compensate for stone wear after each bore is honed. This makes it unnecessary for the operator to make any adjustment for stone wear throughout the life of any set of stones.

Honing Cylinder Bores

Cylinder bores in cast iron compressors are honed as in the typical set-ups shown in Fig. 3. The bores shown vary from 1 1/16 to 2 in. diameter and from 1 3/4 to 3 1/2 in. in length. Stock removal in one operation, usually following diamond boring, varies from as low as 0.001 to 0.0015-in. in most applications, and production in some jobs runs as high as 100 to 150 pieces per hr.

Bores for cast iron crankcase and crankshaft bearings, shown in Fig. 2, are usually from 5/8 to 3/4-in. in diameter and from 1 1/2 to 3 1/2 in. in length. Interrupted type bores are usually made for these parts. Honing accomplishment is approximately the same as for cylinder bores.

Roller bushings are cast iron in some units, and steel in others. Bore for these vary from 5/8 to 1-in. in diameter from 7/16 to 15/16-in. in length. In the application shown in Fig. 4, from 0.001 to 0.0015-in. of cast iron stock is removed from this bore, and the production is approximately 400 pieces per hr. Accuracy is held within a required 0.0003 and size within the required 0.0004-in. in assembly.

Piston (or slide) pins, Fig. 5, are usually cast iron, with bores approximately 5/8-in. in diameter and 3/4-in. in length. Production rates, with stock removal, accuracy and size similar to that

for the bores of roller bushings, is approximately 175 pieces per hour per machine.

Connecting rod crank pins, of cast and malleable iron, have bores varying widely from 5/8 to 3 1/2 in. diameter and from 9/16 to 1 1/2 in. in length. In Fig. 6 a bore 5/8 x 7/8-in. has from 0.001 to 0.0015-in. stock removed in one operation following boring. Production is at the rate of about 300-340 pieces per hour per machine.

In 1921, with comparatively negligible employment, this industry produced approximately 5000 electrical refrigeration units, and sold them at an average of \$550 each. By 1934, with 17,000 employed, it produced and sold some 1,390,000 units. In its last prewar year, 1941, it employed 50,000 people, produced 3,700,000 units and sold them at an average cost of \$160 each. This twenty year period represented a gain of 740 per cent in production, an estimated 2000 per cent increase in employment and a reduction in selling price of over 70 per cent, as well as the less determinable benefits of tremendous food savings, decreased food spoilage, safeguarded health in better food preservation, and the expansion of food merchandising over wider markets.

New Resistors Operate Under Severe Conditions

A new line of Vitrohm M vitreous enameled resistors said to possess excellent thermal shock, momentary overload and salt water immersion characteristics is now being manufactured by Ward Leonard Electric Co., Mt. Vernon, N. Y. The resistors are designed for use where severe operating conditions are encountered.

The grade 1, class 1 units meet Army-Navy specifications and are offered in ferrule, tab and screw terminal types with power ratings from 8 to 155 w. All are claimed to be capable of operation continuously at 275° C.

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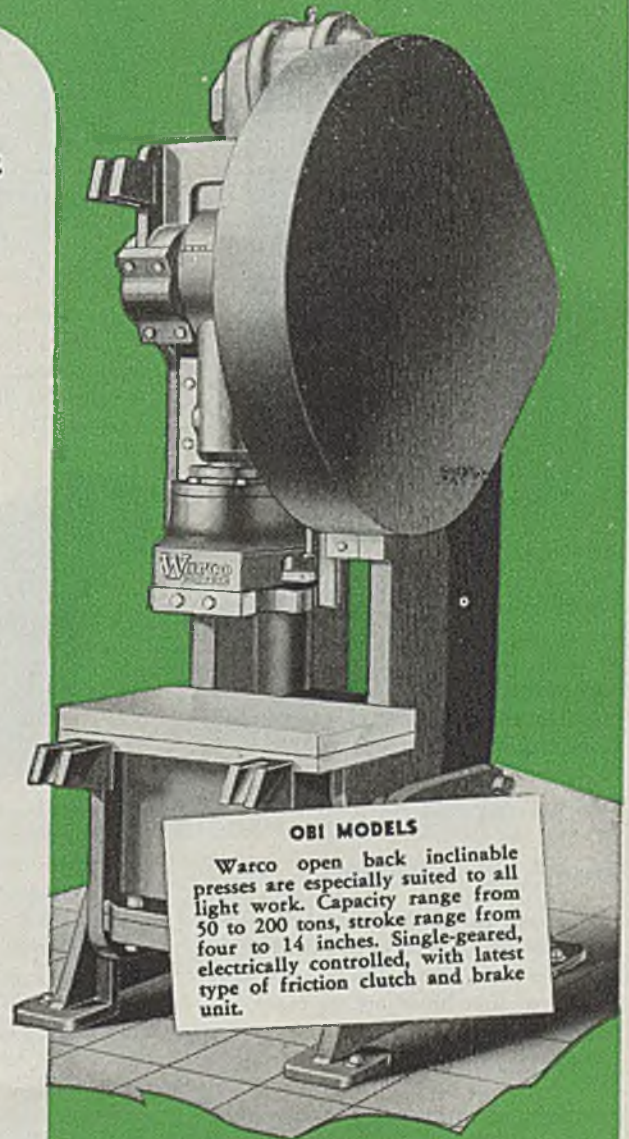
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Warco's experienced press builders give personal attention to your specialized problems. Your inquiry will receive prompt attention. We invite you to inspect our plant, the largest of its kind in the world.



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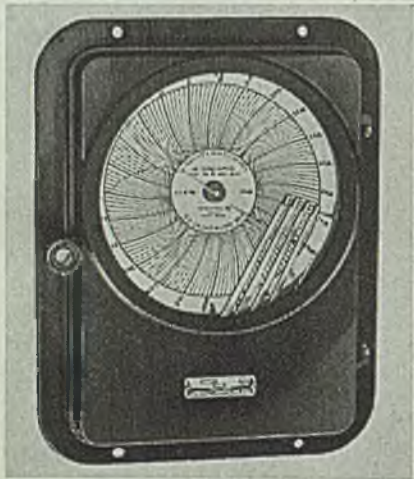
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INDUSTRIAL EQUIPMENT

Operational Recorder

Ess Instrument Co., Bergenfield, N. J., announces an operational recorder to provide continuous record of "time on" and "time off" of multiple operations. Applications include process timing, periodical operations which can be connected electrically such as boiler blowdowns, time



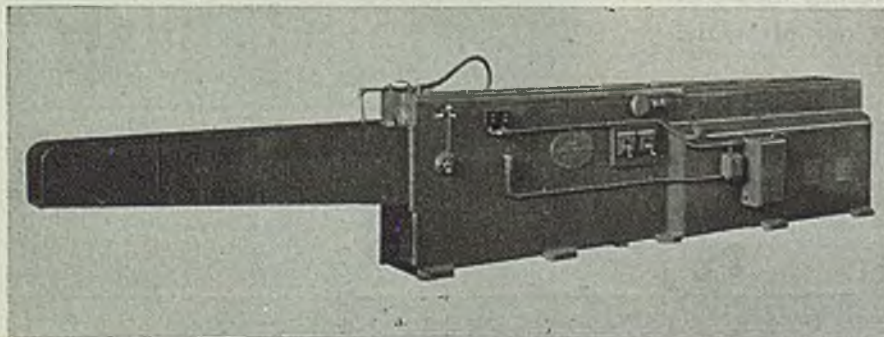
study work and time when a particular check is made, etc.

Instrument can be provided with one, two or three position pens. As many as six single or double acting pens can be combined on a single chart. It is supplied in 115 to 230 v ac or with special voltages. Clock mechanisms are available from 15 min to 8 day periods.

Steel 6/17/46; Item No. 9313

Broaching Machines

American Broach & Machine Co., Ann Arbor, Mich., Division of Sundstrand Machine Tool Co., announces two new horizontal hydraulic broaching machines, featuring a heavy double rolled construction bed to provide rigid support for machine



members. It is especially suitable for heavy internal broaching operations besides surface broaching.

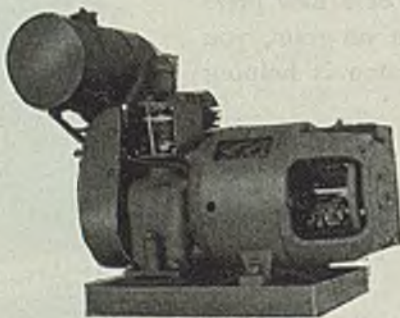
Additional features include infinite variable cutting speeds, hydraulic cylinder secured to top of bed, accurately ground hardened steel ways, chip compartment placed for easy chip removal, adjustment assuring straight-line pull.

Machine size HD-15-66 is of 19 ton maximum capacity, has a 66 in. stroke and a speed variable from 15 to 29 fpm. Size HD-20-66 has a maximum capacity of 28 tons, a 66 in. stroke and a speed of 14 to 20 fpm.

Steel 6/17/46; Item No. 9289

Engine Generator Set

Kato Engineering Co., Mankato, Minn., is offering a new model battery charging engine generator set which is powered by a Briggs and Stratton model NP engine. Latter features float-feed carburetor and



gravity-feed, sensitive flyball governor which permits adjusting charging rate.

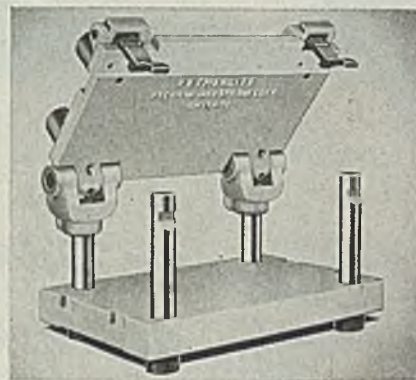
Generator is bolted to side of engine crankcase, and drive end of armature is piloted onto engine crankshaft. Sealed ball bearing carries outer end of armature. Extra-long commutator uses four sets of dual brushes. Heavy conductors and large terminals permit handling large volume of current with low voltage drop.

Self-cranking plant is capable of charging 6, 12 and 32 v and is offered in two sizes, a 240 w size charging up to 40 amp at 6 v and 500 w size charging up to 80 amp at 6 v. The engine also can be cranked by hand.

Steel 6/17/46; Item No. 9310

Snap-Lock Jig

Hedstrom Industries Inc., 4856 West Division street, Chicago, announces a new snap-lock jig of OH-38 aluminum alloy featuring hand-operated clamp screws



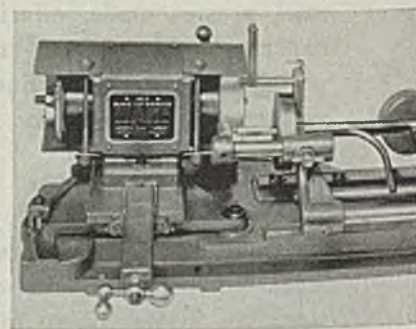
which hold work in place. Lock construction permits instant opening, closing and accurate placement of piece.

Unit is assembled into 1, 2, 3, or 4-way jig, with everything ready for locating bushings, clamps and nest. Interchangeable posts accommodate work of any height.

Steel 6/17/46; Item No. 9302

Cam-Actuated Chuck

A new type universal chuck, utilizing a pinion-operated, 3-lobe cam to actuate the jaws, is announced by Edward Blake Co., 634 Commonwealth avenue, New-



ton Centre, Mass. A spring on each jaw holds it open when cam is turned in pressure-relieving direction.

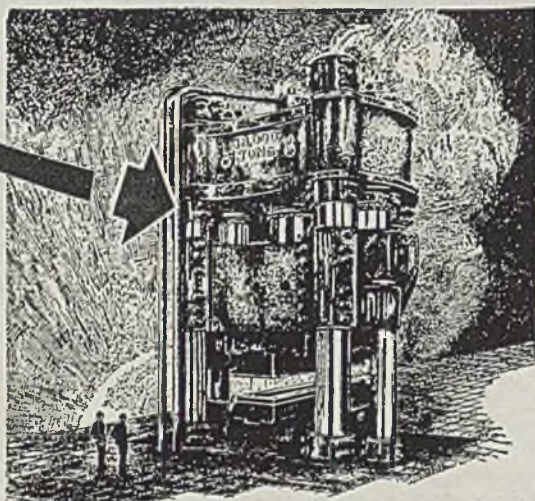
Chuck design allows development of great jaw pressures on work, making grip positive. Chuck can hold taps having diameters from $\frac{1}{8}$ to 9/16-in.

The cam-chuck principle may be applied to other types of chucks, both general purpose and special. It can be

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 145.)

18,000 TON Die Forging Press

**WILL TEAM UP
with R-S FURNACES**



Looming on the horizon—the largest die forging press in the world, now in process of installation at Wyman-Gordon. When this press is completed at the end of this year, magnesium and high strength aluminum alloy forgings larger than any yet made will be available. This press will be operated by Wyman-Gordon Products Corporation, a wholly owned subsidiary of Wyman-Gordon Company for the account of Reconstruction Finance Corporation which

owns the press, and will be available to aircraft manufacturers in particular and to industry generally for experimentation in and for the development and production of light metal forgings. This means to our aircraft industry reduced weight which, in turn, means increased payload and greater performance for American planes... And for industry in general—complete range of magnesium and aluminum forgings.

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WORCESTER, MASSACHUSETTS, U. S. A.

This, the largest die forging press in the world, will make available larger magnesium and high strength aluminum alloy forgings than any yet made.

Wyman-Gordon Products Corporation selected four R-S Furnaces for the heat-treatment of work to be turned out by this mammoth press.



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Note from this unretouched photograph how the six strands of the dead end have been pushed down and locked into place—and how the six strands of the pull or load rope have not been distorted in any way. Such lack of rope distortion would be impossible with the old, obsolete hand-tuck splicing.

When you cut the ACCO-LOC Safety Splice with an abrasive cut-off machine you see, by cross-section, why this new and revolutionary method for making wire rope endings is so efficient. Not the slightest distortion of rope structure; maintains equalized stresses in all strands; no off-center pull on the load rope.

More than being 100% efficient, the ACCO-LOC Safety Splice is safe. No seizing wires to loosen; no wire ends to barb. Extremely flexible and easy to handle. Send today for fully detailed literature.

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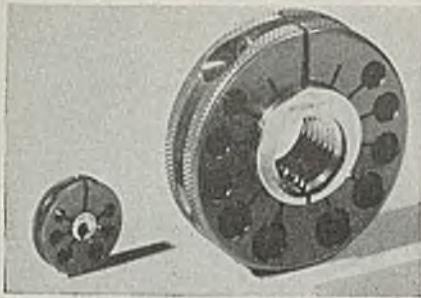
**AMERICAN CABLE DIVISION
AMERICAN CHAIN & CABLE**

made with two, three or four jaws, which may be formed to accommodate odd-shaped pieces.

Steel 6/17/46; Item No. 9320

Thread Ring Gage

A new type of adjustable thread ring gage, which maintains roundness because its design distributes wear over 360 degrees, or the full thread, is introduced by N. A. Woodworth Co., Detroit. The gage is adjusted along the



helix angle of the thread, thus preventing a jump lead at the adjusting slot of the gage.

The aluminum alloy outer body eliminates weight, reduces operator fatigue, increases accurate inspection and provides greater sensitivity. It cannot be thrown out of adjustment by ordinary blows or falls.

Steel 6/17/46; Item No. 9321

Fire Extinguisher

Transitank, a new portable fire extinguishing unit with capacity of 750 lb of liquid carbon dioxide is now offered by Cardox Corp., Chicago. It is for use in hazardous locations involving flammable liquid storage and handling, mixing or processing operations, electrical equipment, spraying and washing.

Liquid carbon dioxide is stored in refrigerated and insulated pressure vessel at a constant temperature of approxi-



mately 0° F at 300 psi. At this temperature, the liquid carbon dioxide yields finely divided particles of 47 per cent CO₂.

Three models are offered: An indoor-outdoor unit equipped with pneumatic tires, which may be propelled either by hand or by industrial power truck; a steel caster unit designed for extreme maneuverability; and a motorized unit capable of traveling long distances.

Steel 6/17/46; Item No. 9329

Deflection Detector

The deflection pick-up, manufactured by Stevens-Arnold Co., 22 Elkins street, South Boston, Mass., translates minute deflections or pressure variations, applied to its plunger, into linear changes in its dc output voltage. Readings are obtained in range of 0.0005 to 0.1-in. movement of plunger, and in responses up to 100 cycles per second.

Because its output is 75 millivolts and its internal resistance less than 1

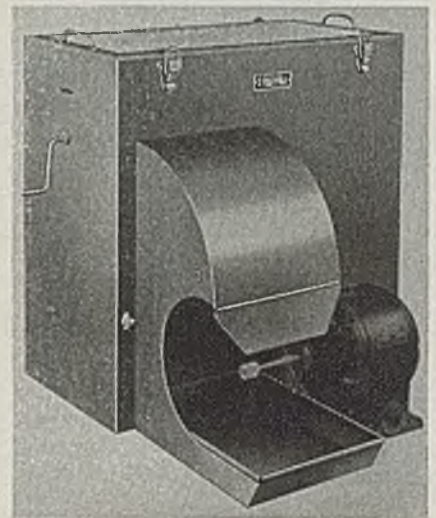
ohm, pick-up may be connected directly to standard indicating instruments.

It may be used under unfavorable operating conditions, including heavy vibration, temperatures up to 300° F. Because it is hermetically sealed, it may be submerged in water. It operates on 115 v ac from an 8, 12, or 24 v battery. Results may be recorded on a continuous strip chart.

Steel 6/17/46; Item No. 9158

Dust Collector

A self-contained industrial dust collector, requiring no installation other than mere positioning of unit and plugging into lighting circuit, is announced by Aget-Detroit Co., 602 First National building Ann Arbor, Mich. Designed primarily for bench-type dry grinding, this collector designated as model 421



Dustkop has a wide range of uses in buffing, polishing as well as wet grinding.

First of two air cleaning stages removes the heavier dust and lint, while

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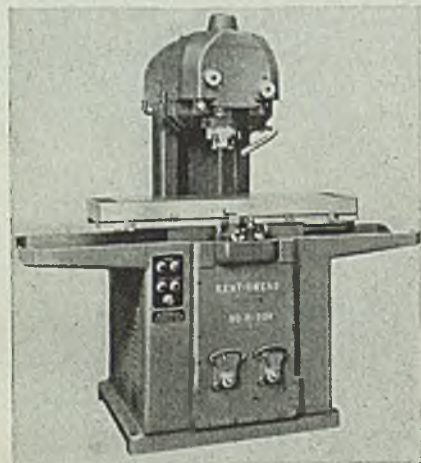
(All claims are those of respective manufacturers; for additional information fill in and return the coupon on this page.)

second stage is a spun glass filter which gives air a final cleaning to remove finer particles of dust.

Steel 6/17/46; Item No. 9333

Vertical Miller

Independent adjustment of feed rate for opposite directions of table makes possible milling of a part at one end of table at slow feed rate and setting up



a different job at other end on the model 2-20 vertical milling machine manufactured by Kent-Owens Machine Co., Toledo, O. Miller features a 42 x 20 in. table with 20 in. travel.

Table can be fed or rapid traversed in either direction, automatically shifted from rapid traverse in either direction, and automatically reversed at both ends of stroke. Machine has a 4 in. micro-

meter adjustment on quill and a maximum gap of 10 in. between nose of spindle and table surface.

Between standard foot-mounted ball-bearing spindle drive motor and cutter there are three gear contracts. Entire drive is mounted on anti-freeze bearings, with lubrication being automatic. Spindle speeds may be adjusted by changing spline mounted pick-off gears contained in head.

Steel 6/17/46; Item No. 9435

Lifting Dump Truck

A multi-purpose lifting dump truck with table top has been developed for use in foundries, for carrying dies from storage to presses. Manufactured by Lewis-Shepard Products Inc., 248 Walnut street, Watertown, Mass., it has a lowered

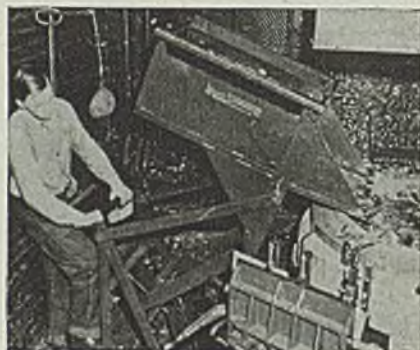


table top height of 36 in., but may be raised 6 in.

Removal of top converts truck into a bin truck, which dumps automatically

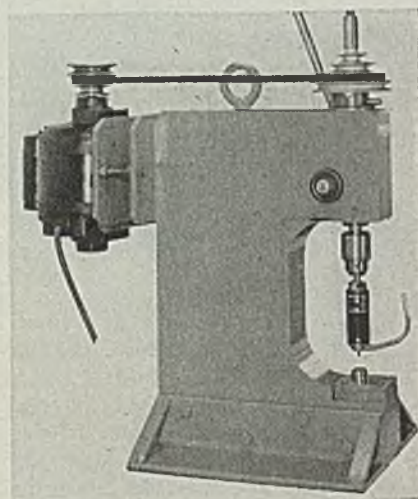
when lifted to dumping height. Lifting is accomplished hydraulically. Lowering speed is constant, controlled by a dead-man type handle.

Bin capacity is about 3¼ cu ft, weight handled is 1000 lbs.

Steel 6/17/46; Item No. 9300

Spin Dimpler

A spin dimpler announced by Topflight Tool Co., Huber building, York, Pa., eliminates the difficulty of dimpling brittle,



high-stressed aluminum and magnesium metals. Dimples are free of cracks and a sharp corner at face of sheets is obtained. A special yoke has been designed so dimpler may be operated with greater ease.

Steel 6/17/46; Item No. 9296

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 145.)

Powder Metallurgy

(Continued from Page 108)

while bars for plate and sheet are rectangular. To reduce sintering costs, a continuous effort has been carried on to produce bars as large and as long as possible.

The compacting of a large mass of small, brittle metal particles presents a serious problem in the powder metallurgy of these metals. In the first place, enormous pressures must be used to make the powder particles adhere to each other during the subsequent removal from the mold and handling. Pressures used may run as high as 50 tons per square inch, and since these powders do not tend to flow under such high pressures, it becomes necessary to apply the pressure evenly on all sides of the compact. To carry out this procedure, presses capable of exerting total pressures of 3000 tons directed in three ways and without more than a few thousandths of an inch distortion have been built. These have con-

stituted one of the outstanding developments in hydraulic presses, one of which is shown in Fig. 1. The bars are fragile, and to facilitate handling they are fired in a hydrogen atmosphere for a short time at 1000 to 1200° C.

The next step is known as "sintering" or "treating" in the powder metallurgy field. This step provides the real basis for success of powder metallurgy. In this operation the bars are mounted separately in water-cooled vertical furnaces with fixed clamp at the top of the furnace and the bottom clamp floating in a pool of mercury. The floating clamp provides for the large dimensional changes which take place during the sintering operation. The bar itself serves as a resistance unit to the passage of electric current and when several thousand amperes are passed through the bar, its temperature may be raised to any desired degree.

The actual sintering temperatures are always close to the melting point of the metal. In the case of tungsten this tem-

perature approximates 3000°C (5400°F). It should be remembered that in this operation the powder particles do not fuse or melt, and yet some of the individual powder particles rearrange themselves and grow at the expense of the adjacent particles. This eventually results in an ingot or solid bar of the metal very closely resembling what would be obtained if the metal had been melted and cast in a mold.

A bank of hydrogen atmosphere furnaces used for sintering tungsten or molybdenum bars is shown in Fig. 2.

The sintered tungsten bars are rather brittle, and must be worked hot, but as the metal is wrought, its ductility increases so that working temperatures may be decreased to the point that fine wire is drawn at room temperatures. Wire bars are worked by swaging, first by hand, then in continuous machines, as shown in Fig. 4. Rod of the diameters used in electrical contacts (roughly 0.078 to 0.250-in.) is cut into disks with thin

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abrasive wheels. Wire drawing is begun in cemented carbide dies, both the wire and the die being heated; fine wire is drawn in diamond dies. Rectangular bars for sheet are rolled hot.

The metallurgy of tantalum and columbium presents a number of problems peculiar to these metals. One of the most useful properties of tantalum (and columbium, too) is its ability to absorb and retain gases at elevated temperatures in electronic tubes, thus helping to maintain the high vacuum necessary for efficient performance. Another useful property is its almost complete immunity to corrosive attack which, combined with high thermal conductivity, makes tantalum highly desirable in chemical plant equipment, and more recently, as surgical implants in the human body. Both these properties, most useful in the finished metal, make production processes difficult. Only extremely active reagents such as hydrofluoric acid can be used in the treatment of ores and intermediate materials. The metal can be heated only in high vacuum or in the presence of one of the noble gases.

The pattern of tantalum and columbium metallurgy follows that of tungsten and molybdenum in a general way. Both these elements occur in tantalite, a tantalate and columbate of iron and manganese. The ore is fused with hot caustic and impurities are removed by a series of chemical treatments, finally resulting in a mixed solution of tantalum and columbium salts. A carefully controlled operation crystallizes potassium tantalum fluoride, K_2TaF_7 , leaving potassium columbium oxyfluoride, $K_2CbOF_5 \cdot H_2O$, in solution for subsequent recovery.

Reduction to tantalum metal powder

is accomplished by electrolysis of the fused salt. The powder is compacted into bars in a hydraulic press much in the same manner as tungsten and molybdenum powders. However, the sintering techniques for tantalum and columbium differ from that of tungsten in that sintering is done in a high vacuum furnace, a battery of which are shown in Fig. 5. After sintering, bars are forged cold with a power hammer and sintered again to give highly dense metal.

Unlike tungsten and molybdenum, tantalum and columbium are quite ductile, and all rolling, swaging, drawing and forming operations are performed on the cold metal. The metals withstand a considerable amount of deformation before becoming work-hardened, and annealing is accomplished by heating the metal in a vacuum.

Scrap Not Used

The refractory metals differ from those of lower melting points so far as utilization of scrap is concerned, since scrap cannot be melted and used in the conventional manner. No scrap is used in production of Fansteel tungsten or molybdenum. This scrap is either sold or used in the production of hard nonferrous alloys. Tantalum scrap is converted chemically, then reduced to powder, whence it is processed in the same manner as virgin powder.

Before the war, our production of these refractory metals and their compounds proceeded at a pace sufficient for industrial needs. In 1940 and 1941, as the clouds of war gathered, the need for greater quantities of these metals became apparent. Later, as the radar program began to unfold, the need for these

metals, especially tantalum, became acute. Increased production could not be obtained merely by multiplying existing equipment. Prewar methods required individual skill in a number of key operations, skill which could not be instilled in new employees in a short training course. It became necessary to design new and larger equipment, revise methods with a view toward mechanization and instrumentation, and in general plan toward larger units and lots.

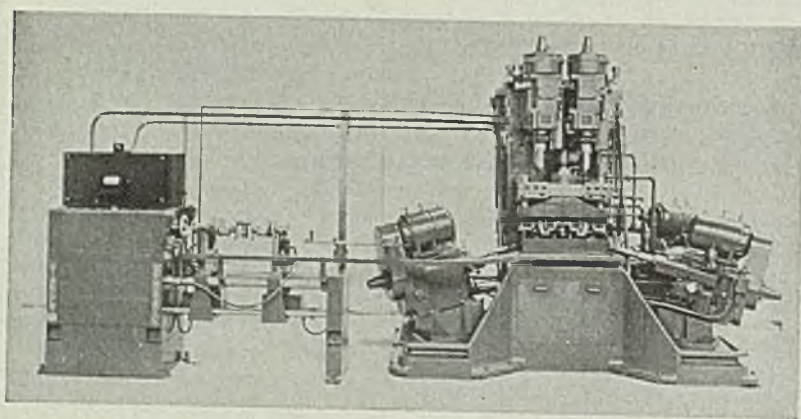
The development staff at Fansteel was cognizant of both the inadequacy of capacity and lack of mechanized or automatic controls on the then existing equipment. We had been aware of the shortcomings of our hydraulic presses, our sintering furnaces, rolling mills and other equipment, and designs for bigger and better equipment were past the "dream stage." The frailty of the human operator, and even of the control laboratory technician, was also recognized.

Four months before Pearl Harbor, blueprints for a \$5 million tantalum plant were laid before the authorities in Washington. These plans contemplated a long, hard war, and a larger radar, communication and electronic tube program than the actual program turned out to be. They contemplated skilled men being called into the armed forces and replaced by women. They contemplated special equipment of a size and capacity much larger than anything of its kind ever made before.

Government approval was obtained, and in January 1942, the Defense Plant Corp. authorized the construction of the plant to be operated under lease by Tantalum Defense Corp., our wholly owned subsidiary. Ground was broken in February, and the first shipment was made in September 1942. By the end of the year, the plant was producing tantalum sheet, wire and fabricated electronic tube parts far beyond its planned capacity. In the meantime, the facilities of the old plant were being used around the clock and the walls bulged with added equipment and personnel.

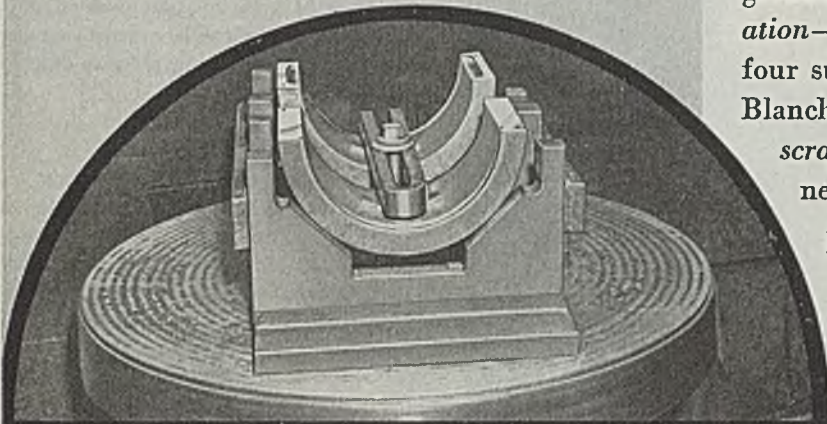
In 1943, the need for more tungsten and molybdenum became apparent, and three additional buildings with necessary equipment, were authorized and added to the Tantalum Defense Plant. They were completed and in production by March, 1944.

Sintered tungsten bars during and after World War I weighed about 1800 grams. The present tungsten bar weighs 6000 grams, and is more than three times the length of the "old timer." The pre-war tantalum bar weighed 2000 grams, compared with the present bar of double the length weighing 4500 grams. Because the density of tantalum is less than that of tungsten, the tantalum bars are actually

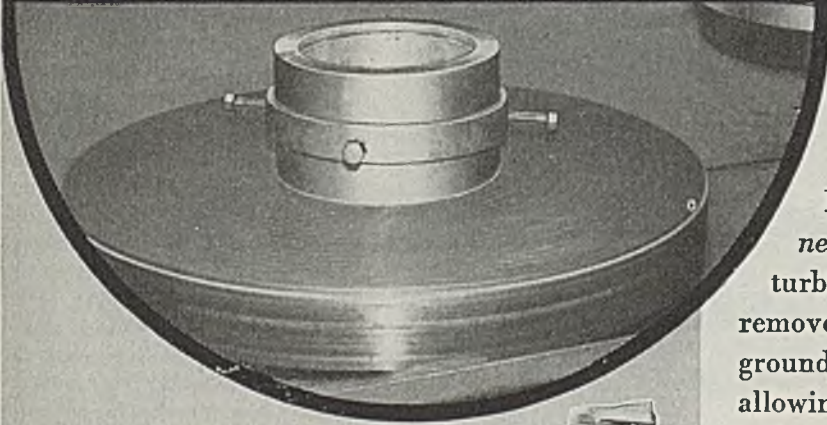


UNBALANCE MEASURING: New development in balancing processes is this two element unbalance measuring and correcting equipment designed by Gisholt Machine Co., and placed in operation in their Madison, Wis. plant during the week of June 10. Entire balancing process on automotive crankshafts can be completed accurately with a minimum of physical and mental effort, and with minimum possibility for human error

"Put it on the
Blanchard"

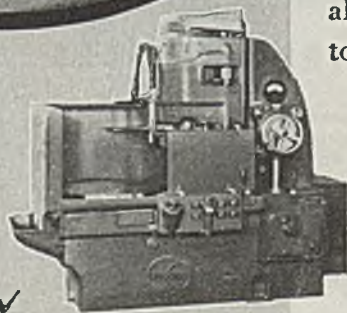


GRINDING HALVES of TURBINE BEARING



Get These Advantages...

- PRODUCTION** ✓
- ADAPTABILITY** ✓
- FIXTURE SAVING**
- OPERATION SAVING** ✓
- MATERIAL SAVING**
- CLOSE LIMITS**
- FINE FINISH** ✓
- FLATNESS** ✓



Material: steel and bearing babbitt

Size (assembled): 12 $\frac{7}{8}$ " O.D., 9 $\frac{1}{8}$ " I.D., 7 $\frac{5}{8}$ " LG.

Held in an inexpensive fixture on the magnetic chuck of a No. 18 Blanchard Surface Grinder, both halves of the turbine bearing are finish-ground at the parting joint *in the same operation*—1/64" is removed from each of the four surfaces. The flatness and finish of the Blanchard-ground surfaces are such that *no scraping* or other means of correction is necessary to provide *oil-tight joints*.

Production is 4 pairs or 8 halves (16 surfaces) per hour. This includes loading and unloading the pieces in the fixture.

The bearing halves are then assembled and held together in a simple clamping fixture. Returned to the Blanchard—*no machine changes are necessary*—both ends of the assembled turbine bearing are finish-ground. (1/64" is removed from each end.) The Blanchard-ground end surfaces are *flat and parallel*, allowing the subsequent finish-boring operation to be registered from either of them.

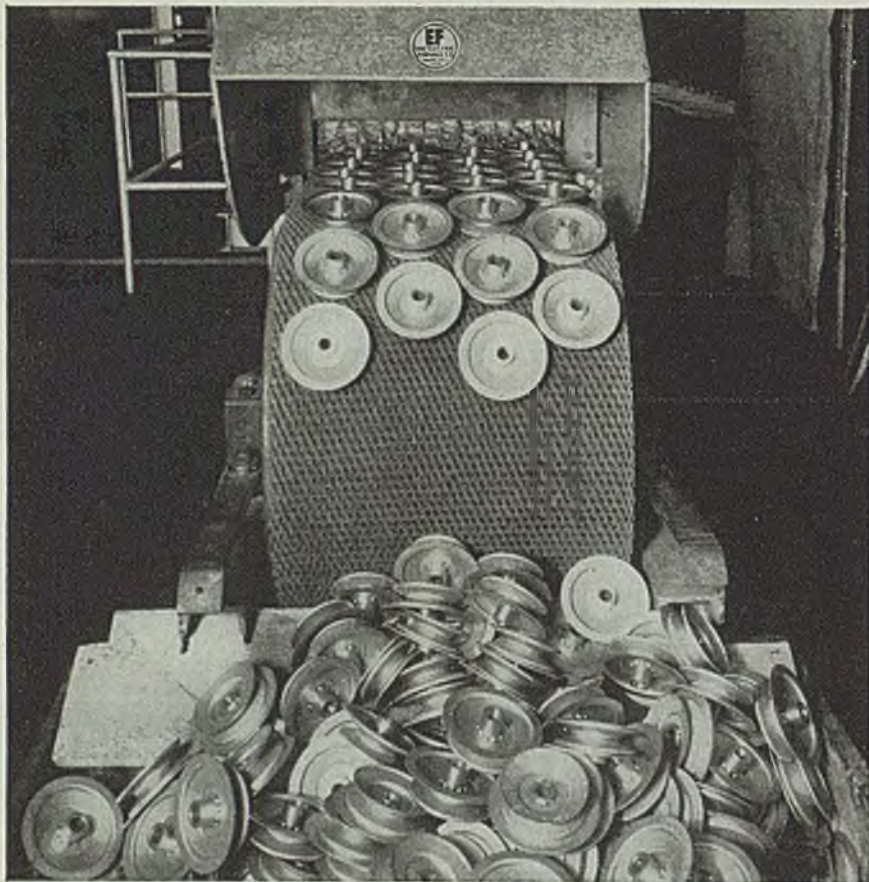
Production is 8 half bearings (16 surfaces) per hour, which includes assembly and clamping time.

Send for your free copy of "Work Done on the Blanchard", third edition. This new book shows over 100 actual jobs where the Blanchard Principle is earning profits for Blanchard owners.



The **BLANCHARD** MACHINE COMPANY

64 STATE STREET, CAMBRIDGE 39, MASS., U. S. A.



Discharge end of an EF furnace brazing three-piece pulley assemblies.

Aluminum, Brass, Steel and Other Assemblies Are Securely and Economically Joined In EF Soldering and Brazing Furnaces

Products ranging in size from small intricate assemblies weighing a fraction of an ounce up to large assemblies weighing several pounds are being neatly and securely joined in EF continuous and batch type brazing and soldering furnaces.

Products which otherwise would be difficult or expensive to make in one piece are being made in several pieces and brazed.

Products requiring several stampings joined or requiring screw machine parts, forgings and stampings to complete the unit, are being neatly and economically joined, right in the production line.

Strong, leak-proof joints are made and the completed units are discharged from these furnaces—clean and bright. Any number of joints in the same product or any number of pieces can be joined at one time.



Investigate This Process

for Joining Your Metal Parts

We will be glad to put samples of your products through one of our furnaces to show you the results you can expect, and give you an estimate on the cost of the equipment to handle your products and production, together with operating costs, if interested.

Send for printed matter showing various types of EF furnaces.

The Electric Furnace Co., Salem, Ohio

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

as large in dimension as the heavier tungsten bars.

Making these increases in bar sizes brought about a number of important benefits, but also involved a number of difficult problems. The benefits are obvious, quality controls became simplified, labor, power and space were saved, larger pieces could be rolled or drawn. The problems, however, were colossal. No hydraulic press of sufficient size was in anybody's catalog, so the largest triple-acting hydraulic press in the world was designed and built.

A skilled operator can sinter a bar with his eye glued to an ammeter or optical pyrometer, making his temperature adjustment by turning a heavy wheel to move a reactive transformer core weighing several tons. But it became necessary to do this important work with semiskilled operators, and not too many of them, and to make the process at least semiautomatic. To bring about these results, sintering furnaces were designed either for single operations or group operation from centralized switchboards, equipped with indicating and recording meters, and push button controls to operate motorized switchgear.

Larger Sintering Furnaces

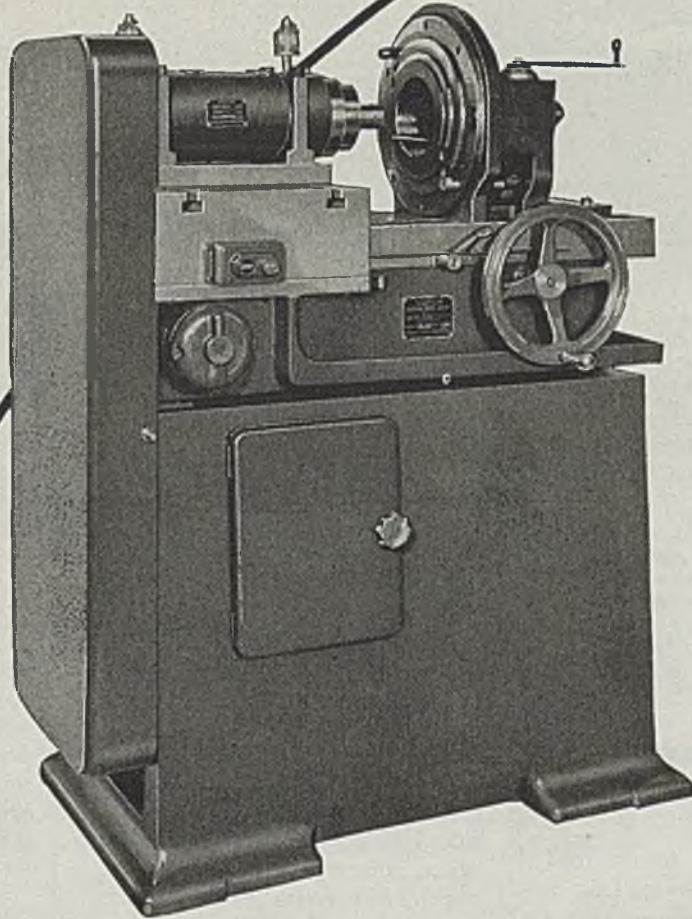
Larger sintering furnaces for tungsten and molybdenum are not so complicated, but it must be remembered that tantalum and columbium are sintered in vacuum. With the old tantalum sintering furnaces, a vacuum of the order of 15 to 20 microns of mercury was not too difficult to obtain. The furnaces (shown in Fig. 5) for the larger bars not only had almost twice the volume to be evacuated, but it was desirable to attain a vacuum of 5 microns or less, thus producing purer and more ductile metal.

To attain these objectives not only required the development and designing of furnaces and vacuum pumps, but the design and construction of a building in which to house the pressing and sintering processes. This building was erected over a reservoir holding 300,000 gal of treated cooling water which is circulated in the jackets of the furnaces on the second floor. On the first floor, in addition to the large hydraulic press, are power transformer, buses and motorized switchgear for controlling the furnaces. Towers, for cooling the effluent water from the furnaces, were installed on the roof.

The matter of vacuum pumps involved not only design, but specially engineered arrangements of more than one pump to increase pumping speed throughout the sintering cycle. In fact, the tantalum sintering project turned out to be a proving ground of co-operating vacuum pump manufacturers. The vacuum not only had to be good, but increased production

SIMPLEX

There are many simple precision boring operations best handled by a simple machine which is applicable to a variety of work and can be operated by relatively unskilled labor. This type of machine permits adjustments and maintenance by the operator thus conserving the limited supply of skilled help for those places where it is really essential. Precision is built into the machine; design of the fixture makes loading and unloading easy for the operator; investment is low justifying its use on small production quantities.



The SIMPLEX No. 2B Precision Boring Machine shown is equipped with No. 3 spindle and a multiple step locator type of fixture for mounting three sizes of motor end shields for precision boring bearing holes in accurate concentricity with the rabbet. A quick-acting clamp operates two hook bars which both seat and eject the piece mechanically so that loading and clamping is very fast and positive and ejection equally fast and positive. Micrometer eccentric adjustment of the tool makes for extreme accuracy in addition to concentricity and squareness desired.

Precision Boring Machines

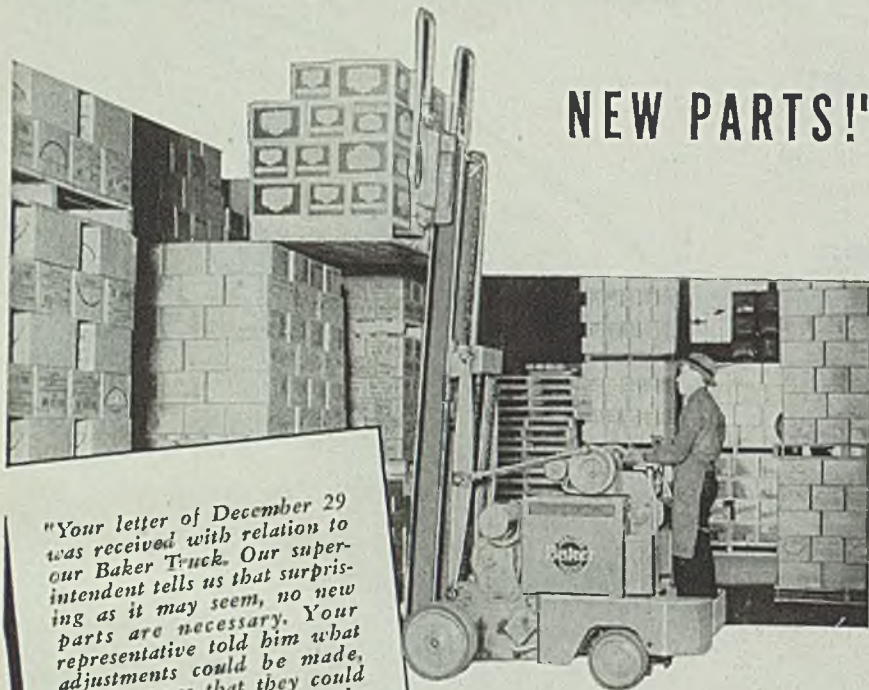
STOKERUNIT CORPORATION

SIMPLEX Machine Tools Division

4532 West Mitchell Street, Milwaukee 14, Wisconsin

Precision Boring Machines, Planer Type Milling Machines and Special Machine Tools

"AFTER 14 YEARS OF SERVICE OUR *Baker Truck* NEEDS NO NEW PARTS!"



"Your letter of December 29 was received with relation to our Baker Truck. Our superintendent tells us that surprising as it may seem, no new parts are necessary. Your representative told him what adjustments could be made, and it seems that they could do it all right there at the cannery. It looks like this is just one more blue ribbon for the Baker Truck, because it is amazing that after all these years of service a general replacement of essential parts is unnecessary. It is certainly very gratifying to us."

—And gratifying to us, too! Letters like the above, from a food processing plant, prove two things: first, that the sturdy construction and high standards of Baker engineering design mean dependable service and long life; second, that proper industrial truck care pays the user big dividends in continuous operation and low maintenance.

The truck in question was purchased in 1931. The original investment has long since been written off—paid for in a short time by actual savings in handling costs and more efficient use of warehouse space. The owner has enjoyed 14 years of trouble-free service—possible only with electric trucks, which also mean quiet, smooth operation, lowest power costs and maximum safety.

• • •

Your Baker representative can show you how these advantages of electric-powered industrial trucks will apply to your handling problems. If you don't already know him, write us direct.

BAKER INDUSTRIAL TRUCK DIVISION
of The Baker-Raulang Company
2167 West 25th Street • Cleveland, Ohio
In Canada: Railway and Power Engineering Corporation, Limited



Member: Electric Industrial Truck Association

Baker INDUSTRIAL TRUCKS

of metal depended largely on a split-minute schedule involving shorter times for evacuating the furnaces, heating the bars, and cooling them off than had ever been attempted before.

Equipment for chemical operations was re-designed, modernized and enlarged with the same general objectives in view, mechanization and instrumentation. Large storage tanks, pumps and pipe lines, replaced carbons and hand lifting with the result that many operations consist simply of opening and closing valves, starting and stopping motors, and checking instruments.

We use 1940 as our last prewar year measuring stick. While it is true that the defense program was under way at that time, it had not affected our company nor had any great influence on production or sales. Most of our product went into civilian goods, and it was a good year, a year which we have used as a basis of comparison with our war activities.

Production Increased

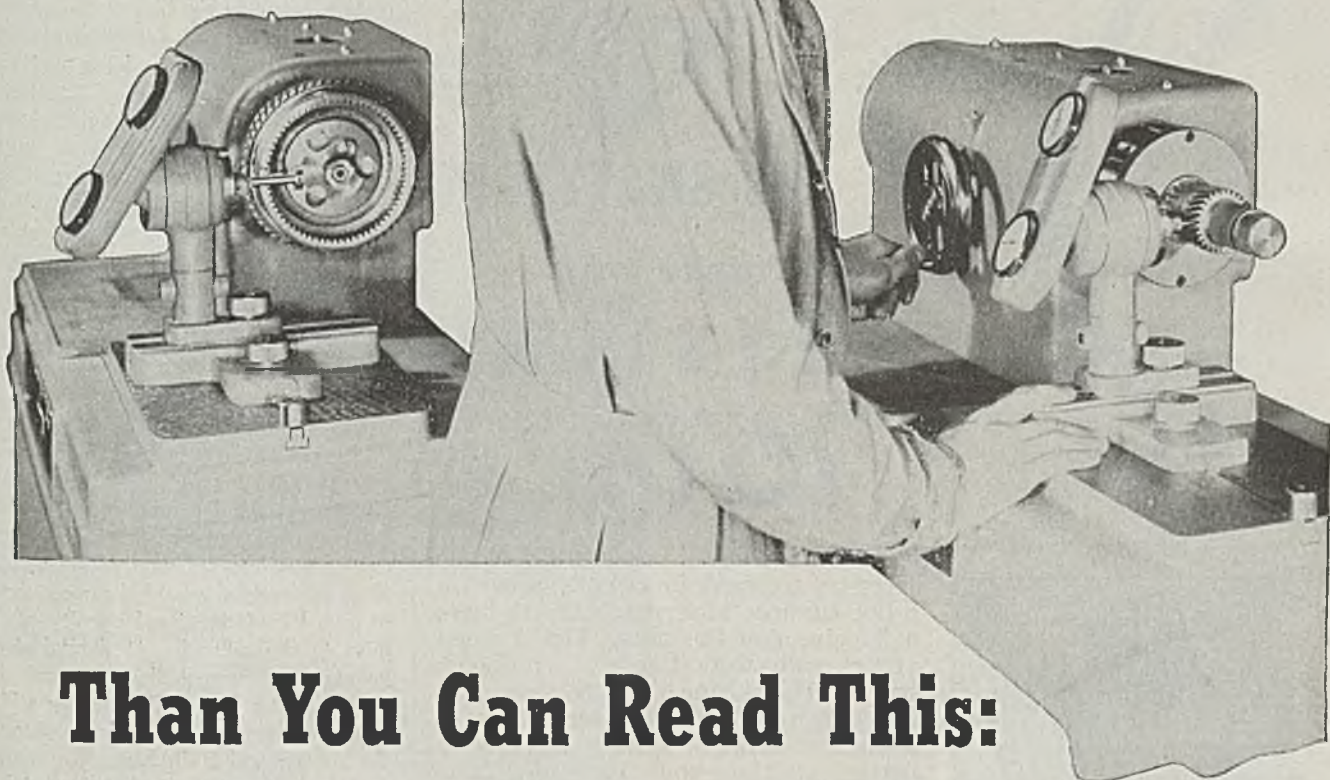
In 1944, Fansteel produced twelve times as much tantalum as in 1940, five times as much tungsten, six times as much molybdenum. This refers to pure metal, and not refractory metal carbide powders formed by controlled reactions in high frequency furnaces shown in Fig. 6. The carbide powders are supplied to Vascoloy-Ramet Corp., an affiliate, and other manufacturers of cemented carbide tools and dies. In 1943, which was our peak year for carbides (it will be recalled that there were cutbacks during the optimistic summer of 1944) we produced nine times as much as in 1940, and 100 times as much as in 1938.

The major part of the pure metals went into the manufacture of electronic tubes for communications and radar, although a large amount of tantalum was used in the manufacture of acid-proof chemical plant equipment, and another sizeable amount was processed into plates, foil and fine wire for use by military surgeons in the repair of war injuries. A sizeable amount of tungsten was used for electrical contacts and targets in x-ray tubes.

Some of the applications of tungsten and molybdenum are interesting from a standpoint of powder metallurgy. One example lies in the field of electrical contacts. Heavy duty switches in aircraft require contacts of a material with low resistance when the contacts are closed, but capable of withstanding severe arc erosion as the circuit is opened. It must be remembered that in the rarefied atmosphere at high altitudes, an arc which is severe at ground level becomes greatly intensified. Silver has the good conductivity to meet the first requirement, and tungsten or molybdenum are satisfactorily

*You can check
a gear*

QUICKER



Than You Can Read This:

With a Michigan Series 1200* lead checker it is the work of only a few seconds to check both sides of four equally spaced teeth on a gear for lead, right alongside the gear finishing machine.

The machine is designed for shop use—in the open—requiring no covers, dust-protection, etc. To set it up for any gear it is only necessary to install the correct master lead. Once set up, it is a *foolproof* single purpose precision machine. Indexing is quick and positive. There are no settings to compute or individual set-ups to make.

It is easily re-set however. For a different size gear, just move the indicator mount in or out. For a gear of different helix, slip in the corresponding **MULTIPLE-THREAD** master lead. To check an internal gear, change the pointer on the indicator.

The two dial indicators are for checking facing tooth surfaces. The machine may be used to check an internal or external gear* up to 10 inch OD, in routine production—with laboratory accuracy.

For further data ask for Bulletin No. 1200-46.

**For gears with helix angles above 45°
use a model 1200-A.*



MICHIGAN TOOL COMPANY

7171 E. McNICHOLS ROAD

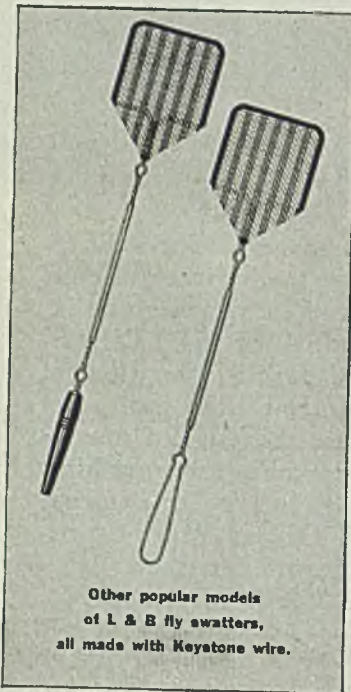
DETROIT 12, U. S. A.

King of Swats . . .



FLY SWATTERS* made with KEYSTONE Wire

*Lubbers & Bell Mfg. Co., Clinton, Iowa



Other popular models
of L & B fly swatters,
all made with Keystone wire.

Ever try to sneak in a short snooze on a hot summer afternoon, only to have a fly give you the buzz? That's when you're ready to do battle . . . no holds barred! The skirmish will be short and sweet with an L & B swatter . . . you're assured of an .800 batting average, or better . . . then you can resume your nap in peace.

But the Lubbers and Bell Company wasn't napping when they made their L & B swatter . . . top grade materials were used throughout . . . special finish Keystone wire handles, as an example.

Yes, uniform wire quality means a lot to Lubbers and Bell — just as it is important to *any* mass-production manufacturer. We are indeed proud that Keystone wire fulfills their exact needs, with steady, sure quality. And Keystone wire is helping hundreds of other manufacturers in just the same way.

KEYSTONE STEEL & WIRE CO.
PEORIA 7, ILLINOIS

Special Analysis Wire
for All Industrial
Uses



Coppered, Tinned,
Annealed,
Galvanized

resistant to arc erosion. The obvious answer is to make a silver-tungsten or silver-molybdenum alloy, but unfortunately these metals do not alloy with each other.

The solution was found in powder metallurgy, where contactor parts were made of carefully controlled mixtures of metal powders by compacting and sintering. Switches and relays equipped with such contacts have been successful in making and breaking direct-current inductive loads as high as 2000 amp with no failures from sticking or welding. Electrical contacts of these materials are now being used in numerous types of industrial switches and circuit breakers.

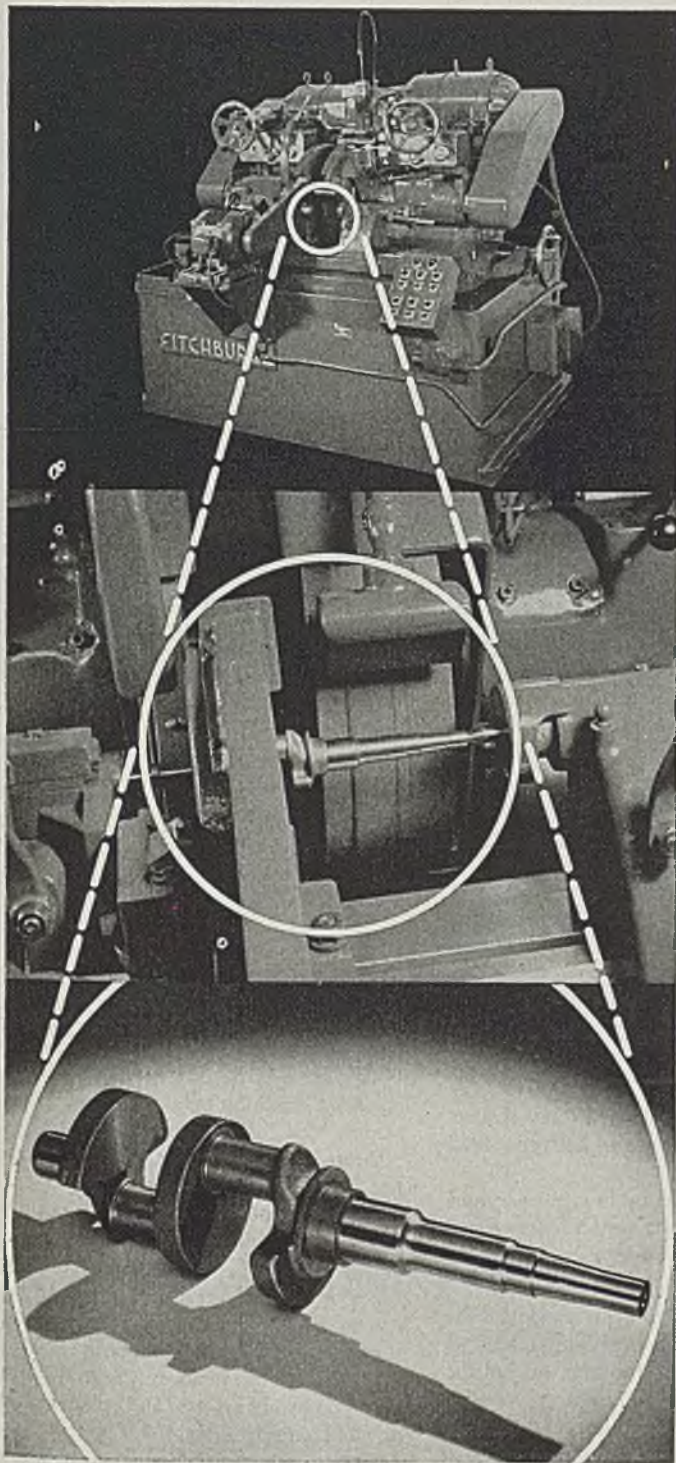
The making of porous powder metal parts is not new, but here is one application which has saved a great many hours of railway maintenance labor and prevented an untold number of late trains. When tantalum is immersed in an electrolyte and current is applied, an anodic film is formed. This film of tantalum oxide permits the flow of current from the electrolyte to the tantalum, but not in the opposite direction. While other metals have this property, the tantalum oxide film is unusually stable, since neither the oxide nor the metal is attacked by the electrolyte.

Application of Current

The practical application of this property is a lightning and high voltage surge arrester, designed to protect railway signal lamps and equipment. Three porous tantalum pellets are immersed in a small jar of electrolyte, two of them connected to each leg of the signal circuit and the third to the ground. At normal signal voltages, no current flows through the arrester, but a flash of lightning or a high voltage surge passes harmlessly through the arrester and is discharged to ground. And the best part of it is that the tantalum arrester is self-healing. After a momentary breakdown, the oxide film, which is the essential part of the device, reforms and the arrester continues to protect the equipment.

This same principle is applied in the making of electrolytic condensers of unusual stability and very high capacity. Condensers of this kind have been used for some time to minimize undesired noise in telephone circuits.

To many, powder metallurgy is a convenience and an economy. To us who work in the refractory metals, it is a grim necessity. Not only is powder metallurgy used to produce the working bars, as we have seen, but when it is considered that the fabrication of these metals is almost always unconventional and sometimes difficult, it is our prediction that powder metallurgy will be used more and more in the making of finished refractory metal parts.



PRECISION

Grinds **6** Central Diameters at one time!

In this latest example of Fitchburg's specialization in multiple-precision grinding for mass production, two standard automatic-cycle Fitchburg Bowgage Wheelheads are mounted on a special base. A center drive attachment is used.

One form-dressed wheel grinds five diameters in a single plunge-cut while the other wheel grinds the sixth diameter.

The operation of the machine is very simple. It consists of loading the work and pressing the start button. The Bowgage Wheelheads go through their automatic cycle simultaneously: rapid traverse to the work... proper grinding feed... spark out... and rapid return—and all six diameters are precision-ground with *fine finish* at one time.

All six diameters are ground *within* the time it would ordinarily take to grind one. In addition to saving the time required for the five other operations, all the dimensions are accurately controlled in correct relation to each other—thereby greatly reducing the chance for work spoilage.

Fitchburg automatic, multiple-precision, mass-production grinding equipment is saving hours and dollars in many large and small industrial plants.

Call on the specialized experience of Fitchburg's grinding engineers. They can show you how to dig hidden profits out of your grinding operations. There is no obligation.

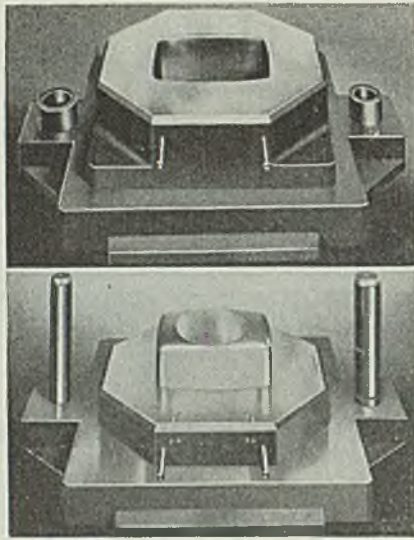
Send for new fully illustrated book—write for it on your business letterhead—it will be mailed free.



FITCHBURG GRINDING MACHINE CORP.

FITCHBURG, MASSACHUSETTS, U. S. A.

Manufacturers of—Bowgage Wheelhead Units, Multiple Precision Grinding Units, Spline Grinders, Cylindrical Grinders, Gear Grinders, Bath Full Universal Grinders and Special Purpose Grinders



▲ Punch and Blank Holder
 ▼ Hood Top Forming Dies



CERTAINLY, THEY'RE
Strenes
METAL

As you plunge forward into post war production, every hour and every dollar saved really counts.

By specifying **STRENES** metal you can get a cast-to-shape die casting that will require very little machining — and a die that will deliver far more pieces between redressings than you would normally expect.

We are regularly pouring die castings of Strenes metal for

Motor car builders... Truck
 builders... Tractor builders...
 Stove manufacturers... Grave
 Vault companies... Farm im-
 plement people.

They will gladly discuss the time and cost savings and the greater production capacity of Strenes dies.

Give them an opportunity to "set you right." Names on request.

The
ADVANCE FOUNDRY COMPANY
 119 SEMINARY AVE.
 DAYTON 3, OHIO



Perforating Press

(Concluded from Page 109)

any speed range so that press will stop near top of stroke when stop button is depressed. A graduation is provided for this adjustment with numbers corresponding to speed graduations on the Reeves Vari-Speed drive unit located on top of press.

Feed is of double roll type and is driven from an adjustable feed crank located on right hand side of press. Feed rolls are of hardened and ground alloy steel and are mounted on bronze bearings. They remain in perfect alignment, providing exact performance.

Ratchet Entirely Enclosed

Feed mechanism is operated through a removable ratchet on right hand side of press. Ratchet is entirely enclosed, but it is easily removed in a few minutes. Standard ratchet furnished with machine provides for a minimum feed unit of 1/64-in. corresponding to one tooth feed of the ratchet. By adjusting feed crank for 1, 2, 3, etc., a feed of respectively 1/64-in., 1/32-in., 3/64-in., etc. up to a maximum of 5/8-in. is readily obtained. Accuracy in feeding results from this arrangement. When in-between sizes of feeds are required, special ratchets can be furnished for a minimum feed as low as 0.010-in.

Convenient releasing mechanism is provided for upper gripping rolls. It is operated from a handle on left side of machine and releases both rolls simultaneously. Heavy enclosed coil springs furnish gripping pressure between feed rolls.

A substantial feed table with side and back gages including guides for sheet between feed rolls and dies completes equipment.

Press is designed to accommodate subpress die sets which are easily installed by sliding them on the top of bolster from left hand side through an opening in housing. Die sets are fastened to slide and bed by bolts.

Dies are made with stationary strippers acting as guides for punches, as shown in Fig. 1. Heavy rigid steel stripper supports are provided in front and rear of slide. These supports are adjusted by set screws on each side to proper contact with strippers. Whenever desired, cam actuated strippers can be furnished.

For die setting and testing, the inch button gives minute control of slide movement. Press is equipped with an automatic electrically operated stopping device which will stop press before tail edge of sheet reaches punching line, leaving a safe margin between last row of holes and edge of sheet. This prevents punches from hitting half and half

on edge of sheet, safeguarding against breakage of small fragile punches.

Operator starts operating sequence by separating feed rolls. Handle is released and sheet inserted between side gages and edge of the sheet is drawn up against back gage and adjusted so that front edge of sheet is safely beyond line of punches, with proper margin.

Feed rolls are lowered and run button depressed. As operation proceeds, a safety device is arranged to stop press before punches reach edge of sheet, to prevent punches from breaking. Feed rolls are released and sheet removed and a new sheet inserted. Straightening of sheets is accomplished in a later operation on leveling rollers. A sheet perforated by this press is shown in Fig. 2.

Another sample of its work appears in Fig. 4 which presents a sheet perforated with 3/32 x 3/4-in. oblong holes. Total open area is 37 per cent; ends are staggered; and holes center-to-center are 3/16-in. apart.

Automatic lubricator is standard equipment, and it oil lubricates all bearings on press and feed. Oil lines are provided for lubrication of the guide pins in die sets in order to prolong the life. Pump operates intermittently and at fixed intervals furnishes a shot of oil to all bearings in required amount.

Forging Press

(Concluded from Page 116)

relays for controlling sequence of operations of the furnace and quench elevator are installed in an enclosed panel located at one side of the furnace.

After the trays are discharged from the quench tank, they are moved on a roller conveyor to the discharge position. An electric monorail hoist is used to empty the trays and to place the empty trays on a gravity roller conveyor that conveys the trays to the charge end of the furnace. Another electric hoist at the charge end removes the trays from the gravity conveyor and places them on the charging table.

Crane equipment includes a Shaw-Box four-motor electric traveling unit, having a main hoist of 100 tons lifting capacity and equipped with an auxiliary hoist of 10 tons capacity built by Manning, Maxwell & Moore Inc., Muskegon, Mich. The cage-operated crane has a 74 ft 11 in. span, and is equipped throughout with roller bearings. Motors and electrical equipment were supplied by Westinghouse Electric Corp.

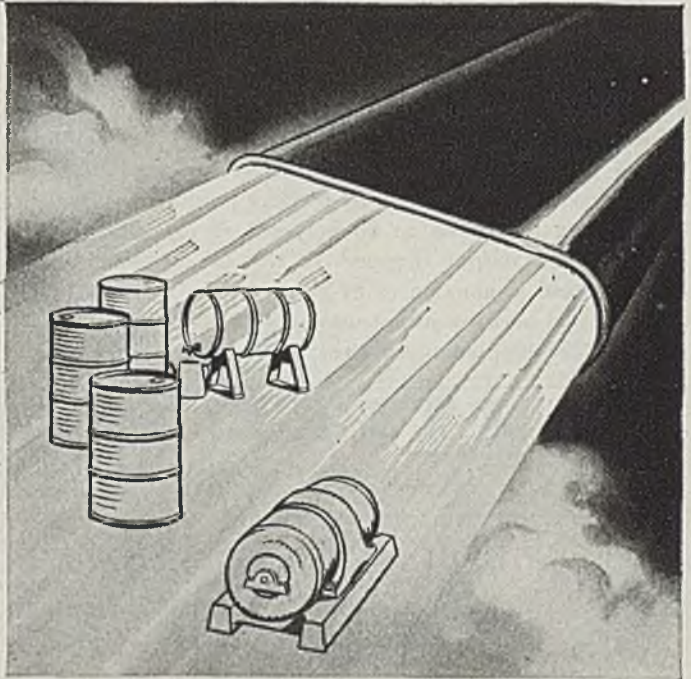
Main plant housing this press and equipment is one of the heaviest buildings in terms of structural steel per cubic foot, 180 x 400 ft, taking more than 3000 tons of structural steel fabricated and erected by Bethlehem Steel Co., Bethlehem, Pa.



PULL THE TRIGGER...

KILL THE FIRE

- **In Flammable Liquids**
- **In Electrical Equipment**



All Kidde Hand Portable Extinguishers work the same simple, natural way: Aim the nozzle. Pull the trigger. Kill the fire.

IT'S JUST AS EASY AS THAT!

Kidde Portables are safe to use, sure in action against incipient fires in flammable liquids or electrical equipment. With carbon dioxide capacities from 2 to 20 pounds, they pack the punch that knocks out small lab blazes or relatively severe industrial fires.

The dry inert carbon dioxide discharged by Kidde Portables cannot damage equipment, nor contaminate liquids. No after-fire mess or moisture.

Your *larger* hazards may call for Kidde Wheeled Units or Systems. But at the smaller danger spots—keep a Kidde Portable within easy reach!

Ask a Kidde representative for details. Better still, place your order *now*.

Walter Kidde & Company, Inc. • 654 Main Street, Belleville 9, New Jersey



The word "Kidde" and the Kidde seal are trade-marks of Walter Kidde & Company, Inc.

Kidde

the BUSINESS TREND

FREEDOM from major strikes enabled industry to boost production 16 points in the first week of June. An even larger gain probably would have been made had it not been for various small strikes.

The 16-point rise put STEEL's industrial production index at 110 per cent (preliminary) for the week ended June 8, compared with the previous week's 94 per cent, low mark for the soft coal and railroad strike period. Most of the gain resulted from renewed activity in steel ingot production and car loadings of bituminous coal. Also up was automobile production which in the week ended June 8 totaled 43,175 units, compared with 31,895 in the preceding week.

CONSTRUCTION—Dollar volume of new construction in May rose 15 per cent over that of April and 109 per cent above May, 1945. The May total was \$814 million. Of this, \$683 million was privately financed and \$131 million publicly financed.

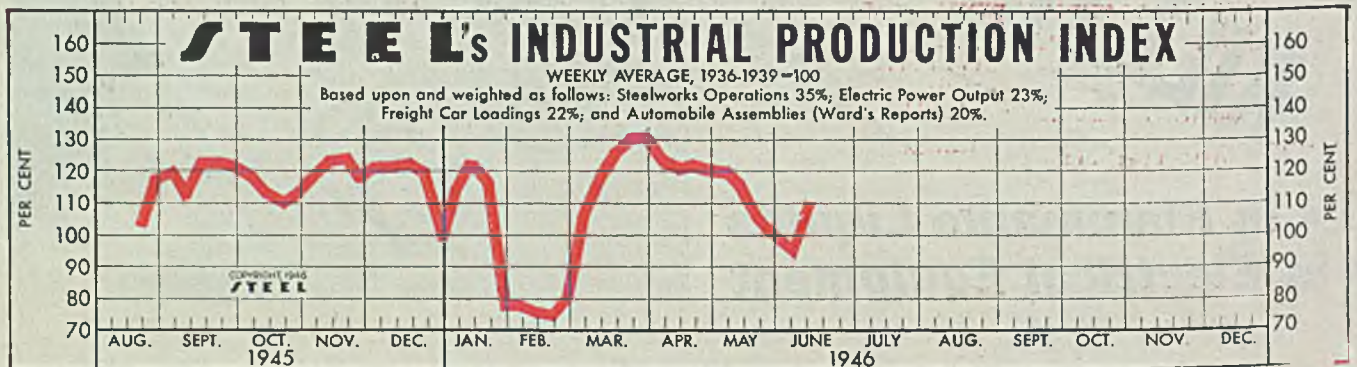
COKE—Production of coke in April totaled 3,878,155 tons, a 29 per cent decrease from March as a result of the soft coal miners' strike. By-product producers slowed their coking operations to 65 per cent of capacity, and beehive plant output dropped to the lowest point on record. April production of by-product coke was 3,851,824 tons and beehive output was only 26,331 tons.

CASTINGS—Shipments of steel castings during March

totalled 101,396 tons, compared with only 57,423 tons in February when the steel strike held production down. Unfilled orders for steel castings at the end of March amounted to 412,325 tons, an increase over the 390,077 tons at the end of February. The backlog approximates five months' production at the current rate of output.

FORGINGS—Steel forgings shipments during March amounted to 122,853 tons, 32 per cent above February shipments but less than one-fourth the shipments during March, 1945, when wartime activities in the steel forgings industry were at their peak. Unfilled orders at the end of March for steel forgings totaled 634,794 tons, a 6 per cent increase over the backlog at the end of February.

RAILROADS—Class 1 railroads had an estimated deficit in April of \$21,300,000, after interest and rentals, compared with a net income of \$55,557,900 in April, 1945, and an estimated deficit of \$42,400,000 in March, 1946. In the first four months of 1946 they had an estimated deficit of \$6 million, after interest and rentals, compared with a net income of \$196,860,976 in the corresponding period of 1945. A factor in this decline is reduced revenue freight traffic volume, which in the first four months of 1946 was estimated at 186,100,000,000 ton-miles, compared with 238,064,354,000 ton-miles in the corresponding period of last year.



The Index (see chart above):

Latest Week (preliminary) 110

Previous Week 94

Month Ago 116

FIGURES THIS WEEK

INDUSTRY

	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	55	43	55.5	90
Electric Power Distributed (million kilowatt hours)	3,920	3,741	3,911	4,327
Bituminous Coal Production (daily av.—1000 tons)	615	1,325	86	1,855
Petroleum Production (daily av.—1000 bbls.)	4,896	4,756	4,734	4,853
Construction Volume (ENR—Unit \$1,000,000)	\$182.2	\$71.9	\$137.6	\$43.0
Automobile and Truck Output (Ward's—number units)	43,175	31,895	71,355	19,580

*Dates on request. †1946 weekly capacity is 1,762,381 net tons. 1945 weekly capacity was 1,831,636 net tons.

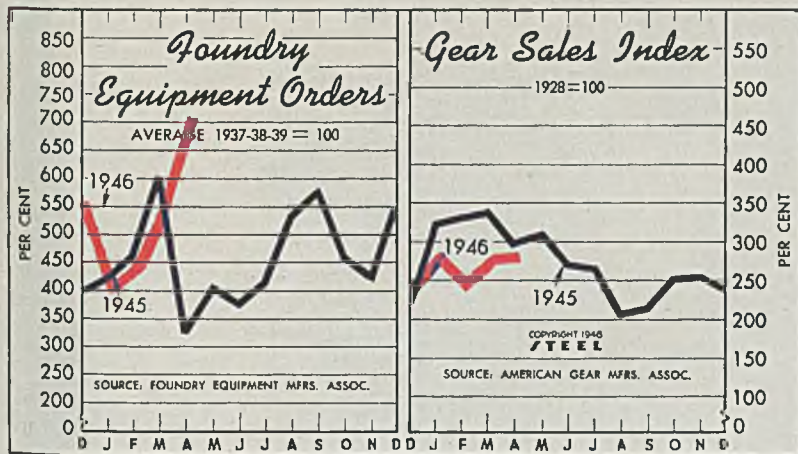
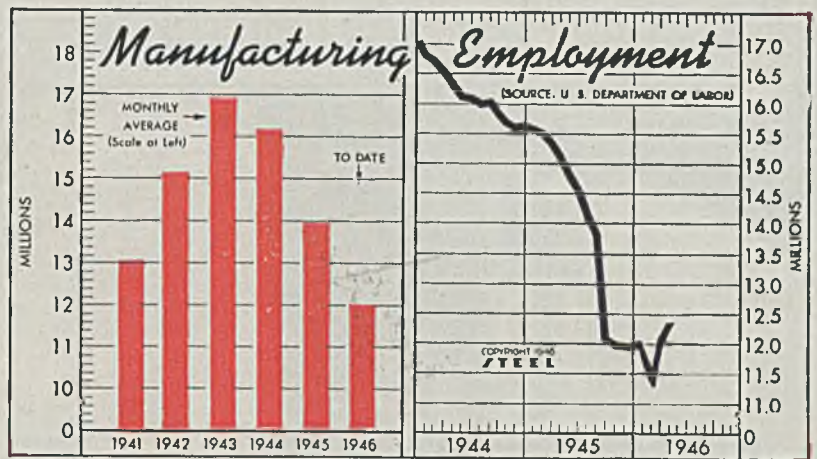
TRADE

	Latest Period*	Prior Week	Month Ago	Year Ago
Freight Carloadings (unit—1000 cars)	761†	627	685	884
Business Failures (Dun & Bradstreet, number)	13	18	23	12
Money in Circulation (in millions of dollars)†	\$28,170	\$28,106	\$27,958	\$26,513
Department Store Sales (change from like week a year ago)†	+31%	+34%	+29%	+4%

†Preliminary. ‡Federal Reserve Board.

Factory Employment
(000 omitted)

	1946	1945	1944
January	12,038	15,555	16,825
February	11,393	15,517	16,735
March	12,004	15,368	16,559
April	12,376	15,102	16,309
May		14,811	16,122
June		14,538	16,093
July		14,130	16,013
August		13,831	16,023
September		12,097	15,843
October		11,941	15,692
November		11,947	15,607
December		11,914	15,632
Monthly Ave.	13,896	16,121	



	Foundry Equipment Orders			Gear Sales		
	Index— (1937-38-39=100)			Index— (1928=100)		
1946	1946	1945	1944	1946	1945	1944
Jan.	392.8	422.4	378.3	269	323	246
Feb.	432.8	465.3	456.8	253	331	214
Mar.	536.6	604.7	498.4	275	339	485
Apr.	701.2	325.0	385.7	284	296	308
May		404.7	503.9		309	305
June		375.4	466.1		271	328
July		411.7	375.8		264	242
Aug.		532.2	450.5		205	247
Sept.		577.2	388.0		213	248
Oct.		457.8	526.5		251	293
Nov.		416.8	369.5		255	209
Dec.		547.6	397.4		239	219
Ave.	461.7	433.1		275	279	

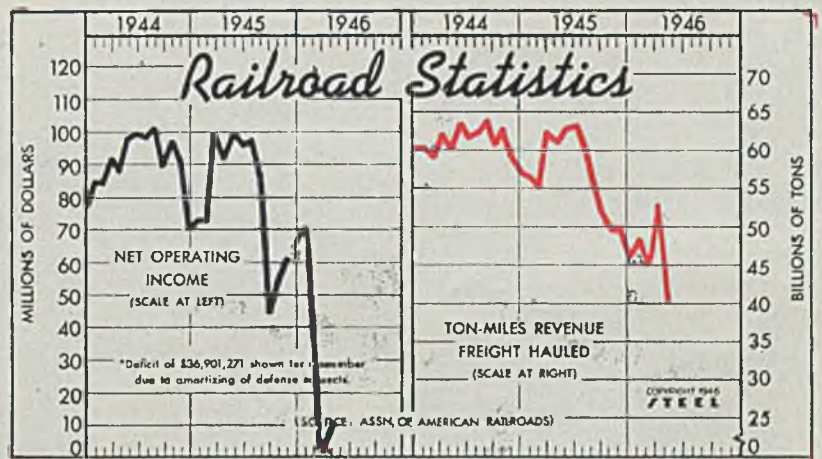
Statistics of Class I Railroads

	Ton-Miles		Net Operating Income		Revenue Freight	
	1946	1945	1944	1946	1945	1944
Jan.	\$70.8	\$73.0	\$84.9	48.2	56.8	60.5
Feb.	57.8	73.2	84.5	45.1	55.3	59.3
Mar.	*20.5	99.9	92.5	52.8	62.9	62.7
Apr.	10.1	91.9	87.7	40.0	61.6	60.4
May		99.9	98.5		63.4	64.0
June		96.1	99.8		63.6	62.0
July		97.1	98.6		60.5	62.8
Aug.		86.7	101.4		56.4	64.5
Sept.		44.0	89.1		52.2	61.0
Oct.		54.4	97.3		50.0	63.5
Nov.		61.3	91.6		50.0	59.4
Dec.		136.9	69.8		46.5	57.3

Ave. \$70.0 \$91.3 56.5 61.5

† Deficit of \$36,901,271 shown for December, 1945, due to amortizing of defense projects.

* Deficit.



o Deficit of \$20,459,240 for March, 1946.

FINANCE

	Latest Period ^o	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	\$10,769	\$10,632	\$12,266	\$11,582
Federal Gross Debt (billions)	\$273.0	\$273.0	\$262.9	\$241.6
Bond Volume, NYSE (millions)	\$19.1	\$16.0	\$22.3	\$44.1
Stocks Sales, NYSE (thousands)	5,582	7,247	7,426	8,234
Loans and Investments (billions)†	\$63.9	\$64.2	\$64.4	\$57.6
United States Gov't. Obligations Held (billions)†	\$45,593	\$45,965	\$45,993	\$42,842

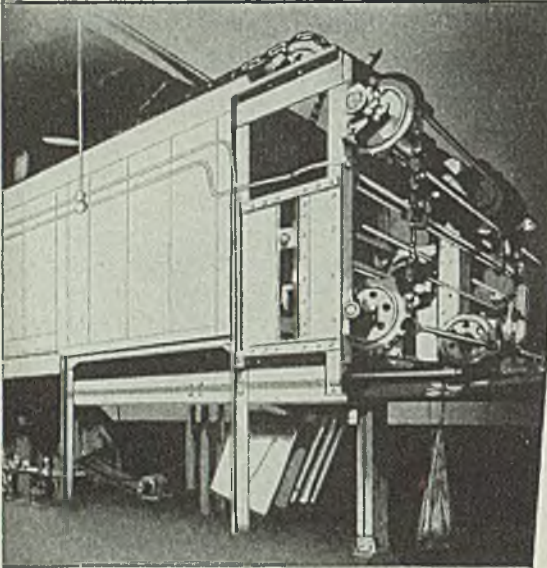
†Member banks, Federal Reserve System.

PRICES

	Latest Period	Prior Week	Month Ago	Year Ago
STEEL's composite finished steel price average	\$63.54	\$63.54	\$63.54	\$58.27
All Commodities†	111.1	110.7	109.9	106.1
Industrial Raw Materials†	125.1	124.2	123.1	118.9
Manufactured Products†	106.5	106.2	105.5	102.1

†Bureau of Labor Statistics Index, 1926 = 100.

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GIFFELS & VALLET, INC.
L. ROSSETTI
ASSOCIATED ENGINEERS AND ARCHITECTS
1000 MARQUETTE BUILDING
DETROIT 26, MICH.

PHONE: CADILLAC 2064

May 3, 1946

Detroit Sheet Metal Works
1300 Oakman Blvd.
Detroit 8, Michigan

Attention: Mr. R. W. Wagner, Engineer
Gentlemen:

We wish to take this opportunity to thank you for the courtesy and cooperation with which you have responded to our requests for information. We have always felt justified in indicating our designs on core ovens, mold dryers, etc. as manufactured by your organization. We believe that you fully deserve the position of eminence you hold in the trade.

Yours very truly,
GIFFELS & VALLET, Inc.

Roy L. Jones
R. L. Jones
Chief Engineer
Industrial Eng. Dept.

REJ:ecg

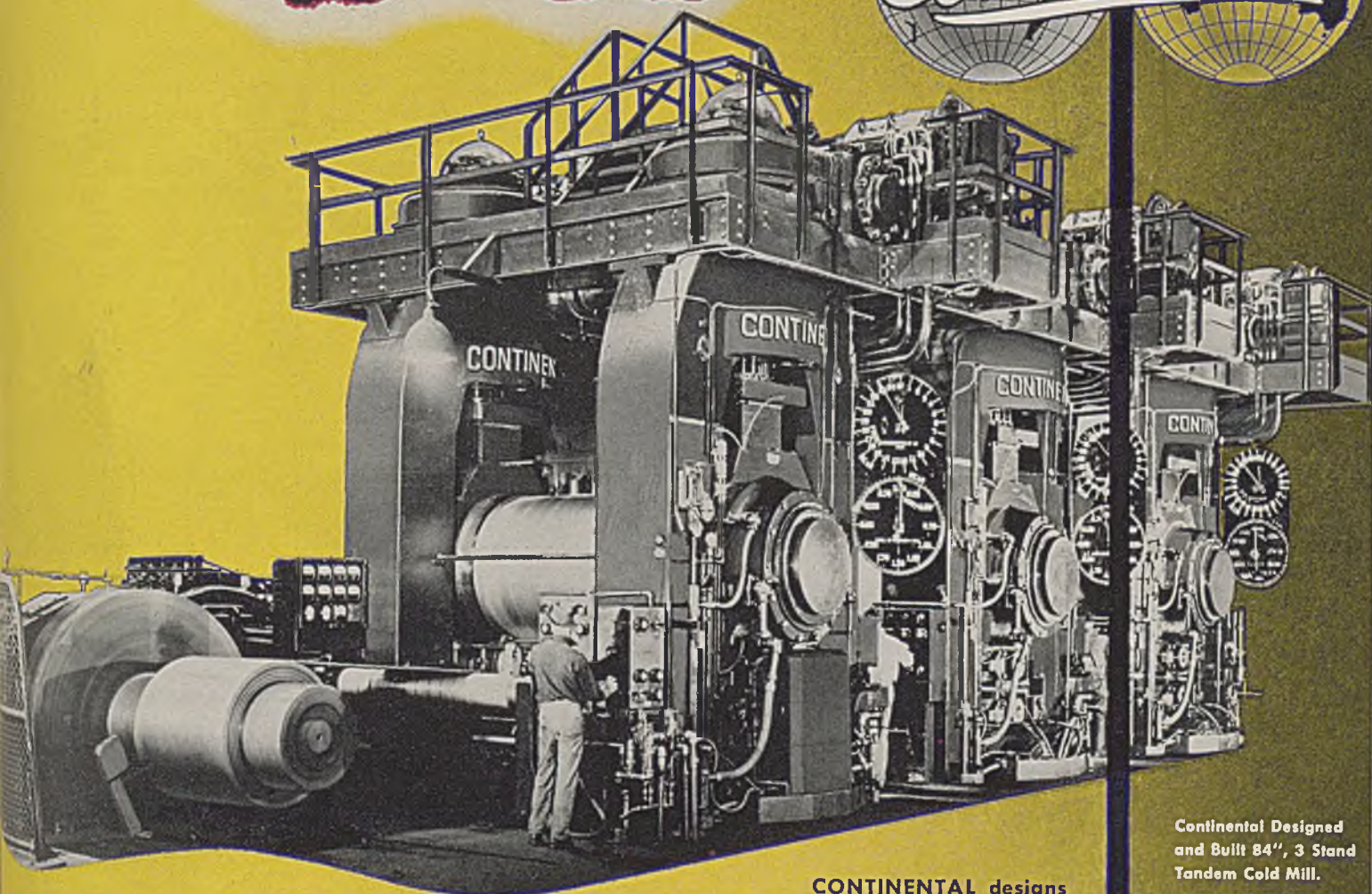


DETROIT SHEET METAL WORKS

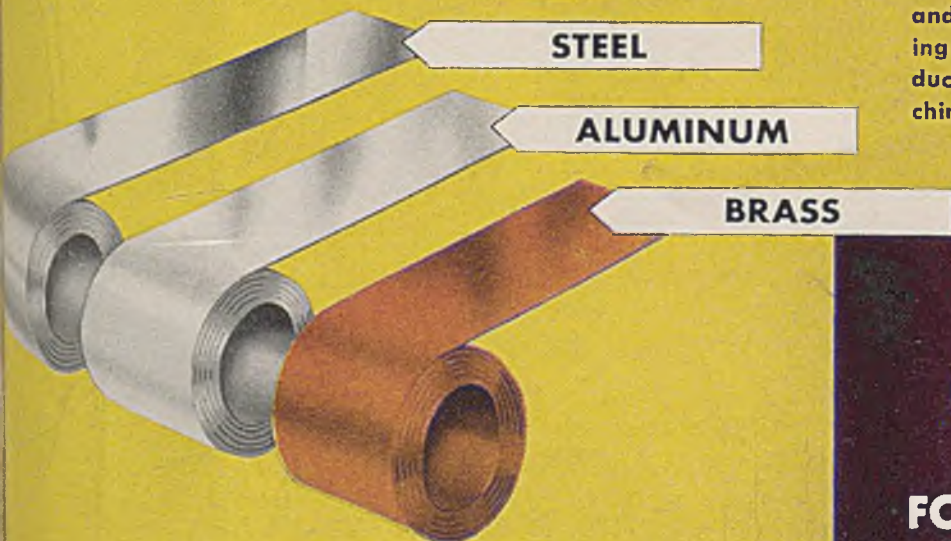
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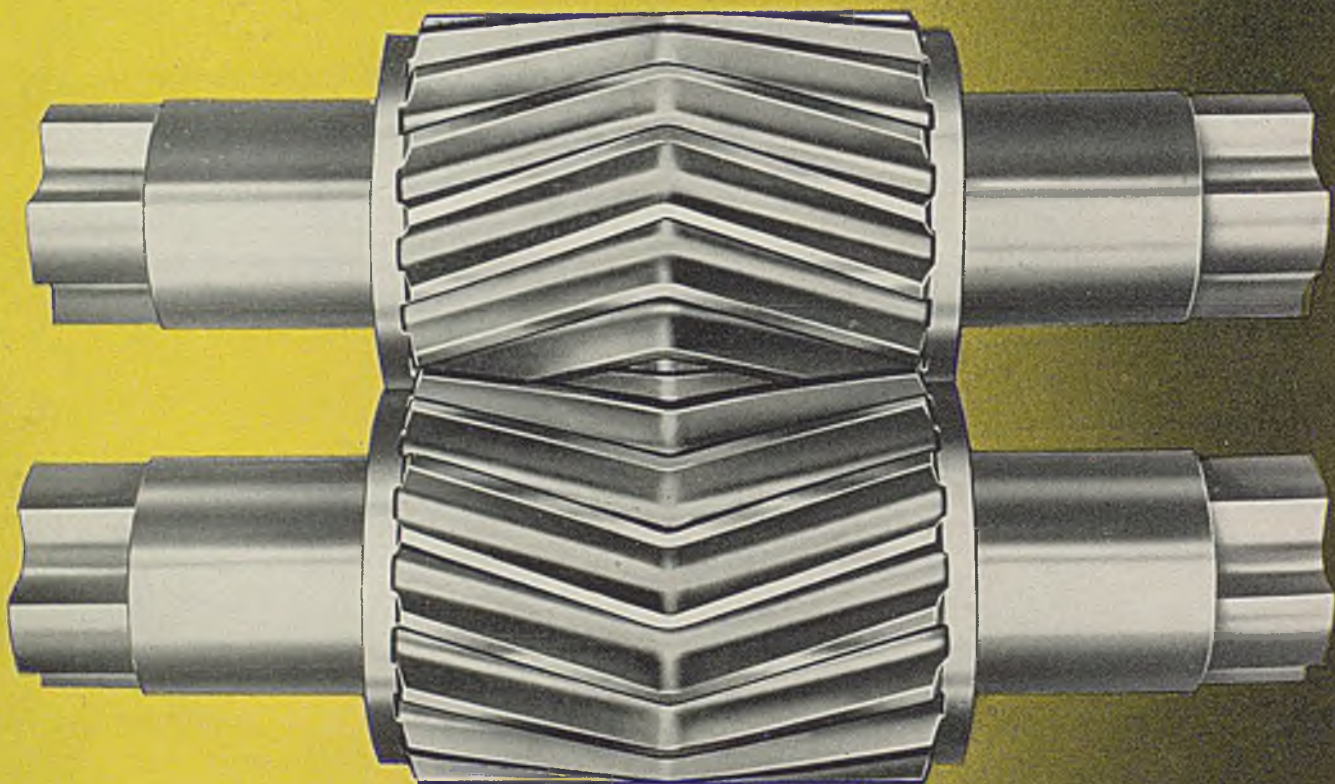
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MARKET SUMMARY

Price Revisions Aid In Clearing Steel Picture

Scrap price advance denied by OPA. . . Alloy schedule revised upward. . . Preferences instituted on steel for housing, farm implements

PRICE revisions highlight the steel and raw materials markets. Price changes are resulting from suspensions of Office of Price Administration controls on various ferroalloys, alloy ores and refractories, while final clarification of the alloy steel price situation is reflected in spreading of the full 8.2 per cent increase, in effect for some time on tool steels and stainless, to all alloy products.

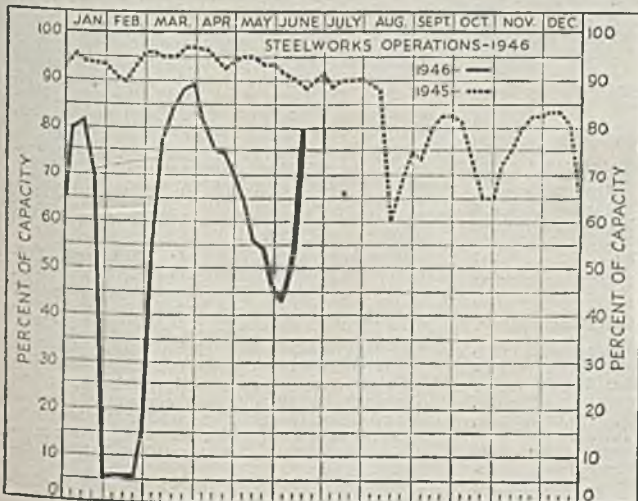
Increases of \$10 per ton have been made in ceiling prices on nails, staples and related products, apparently with the basic idea of stimulating supply for the housing program, and adjustments have also been made in wire cloth, tubular goods and some other products.

With these changes, upward adjustments based on the \$5 per ton overall steel price increase granted last March by OPA are believed completed.

Moderation characterizes increases on products removed from price control and in the case of at least one ferroalloy there has been a reduction. On various items there probably will be no change at all in the near future, particularly on some alloy ores, including molybdenum, which has undergone no change in 12 years, and tungsten and vanadium. Refractory chrome will not be changed, it is believed. Reaffirmation of a number of ferroalloy prices for third quarter points to stability.

Meanwhile word is being awaited on new prices for pig iron and coke, both products having been on adjustable pricing basis for some time, pending analysis by Washington of effects of the recent increase in cost of coal.

Request by the iron and steel scrap industry for a \$2.50 increase in ceiling prices has been refused by Office of Price Administration. This action is expected to release some material which was being held in anticipation of higher prices,



June 17, 1946

DISTRICT STEEL RATES

(Percentage of Ingot Capacity Engaged in Leading Districts)

	Week Ended		Same Week	
	June 15	Change	1945	1944
Pittsburgh	69.5	+29.5	85	91.5
Chicago	79	+18	95	100
Eastern Pa.	81	+24	91	94
Youngstown	42	+12	91	96
Wheeling	79	+14	88.5	96
Cleveland	85.5	+13.5	93	92
Buffalo	86	+ 7	90.5	92.5
Birmingham	95	+41	26	95
New England	80	None	86	85
Cincinnati	87	+ 5	60	89
St. Louis	54.5	None	75	79.5
Detroit	86	+ 7	66	83
Estimated national rate	75	+20	88	98

Based on weekly steelmaking capacities of 1,762,381 net tons for 1946; 1,831,636 tons for 1945; 1,791,287 tons for 1944.

following readjustment in lead, copper and brass scrap. Steel scrap shortage now is the chief obstacle to mills regaining a high level of operation and improvement in supply must await resumption of normal activity by metalworking plants generating scrap.

Because of acute shortages distribution preferences have been reimposed on some steel products, effective for only third quarter, designed to help the housing program and farm machinery. Under the plan manufacturers of critical items must certify to steel mills that orders placed will be used only for the approved list and none for accumulating inventories.

Meanwhile, mills are filled with orders for the remainder of the year, with a large carryover into next year, estimated at two to three months. Schedules are being revised and some cancellations have been asked of orders that have little chance of being processed for months ahead. In only a few products is it possible to place orders currently for delivery late this year.

Upward progress in steelmaking, a rebound from the low point reached during the coal strike, continues rapid, the estimated national rate last week advancing 20 points to 75 per cent of capacity, well on the road to reaching the 89½ per cent that followed recovery from the steel strike. Nearly every district showed a gain, with three holding even, Pittsburgh advanced 29½ points to 69½ per cent, eastern Pennsylvania 24 points to 81, Chicago 18 points to 79, Wheeling 14 points to 79, Cleveland 13½ points to 85½, Youngstown 12 points to 42, Birmingham 41 points to 95, Detroit 7 points to 86, Buffalo 7 points to 86 and Cincinnati 5 points to 87. St. Louis held unchanged at 54½ per cent, New England at 80 and West Coast at 84.

Steel ingot production in May was 4,073,465 net tons, compared with 5,860,258 tons in April and with 7,449,667 tons in May, 1945. This was a loss of 1,787,000 tons from April and of 3,376,000 tons from May last year. For ten months from August, 1945, the end of the war, to the end of May total ingot output was 51,276,314 tons, compared with 73,312,253 tons for the corresponding period a year earlier. This is a deficit of more than 22 million tons, which would account for the scarcity of steel for manufacturing purposes this year.

COMPOSITE MARKET AVERAGES

	June 15	June 8	June 1	One Month Ago May, 1946	Three Months Ago March, 1946	One Year Ago June, 1945	Five Years Ago June, 1941
Finished Steel	\$64.45	\$63.54	\$63.54	\$63.54	\$63.54	\$58.27	\$56.73
Semifinished Steel	40.60	40.60	40.60	40.60	40.60	37.80	36.00
Steelmaking Pig Iron	25.50	25.50	25.50	25.50	25.125	24.00	23.00
Steelmaking Scrap	19.17	19.17	19.17	19.17	19.17	19.07	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 and Wire Rods, cents per lb; coke, dollars per net ton; others dollars per gross ton.

Finished Material

	June 15 1946	May, 1946	Mar., 1946	June, 1945
Steel bars, Pittsburgh	2.50c	2.50c	2.50c	2.25c
Steel bars, Philadelphia	2.82	2.82	2.82	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	2.465	2.465	2.465	2.215
Shapes, Chicago	2.35	2.35	2.35	2.10
Plates, Pittsburgh	2.50	2.50	2.50	2.25
Plates, Philadelphia	2.55	2.55	2.55	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	2.80
Cold-rolled strip, Pittsburgh	3.05	3.05	3.05	2.75
Bright basic, bess. wire, Pittsburgh	3.05	3.05	3.05	2.90
Wire nails, Pittsburgh	3.75	3.25	3.25	2.90
Tin plate, per base box, Pittsburgh	\$5.25	\$5.25	\$5.25	\$5.00

Pig Iron

	June 15 1946	May, 1946	Mar., 1946	June, 1945
Bessemer del. Pittsburgh	\$27.69	\$27.69	\$27.315	\$26.19
Basic, Valley	26.00	26.00	25.625	24.50
Basic, eastern del. Philadelphia	27.84	27.84	27.465	26.34
No. 2 fdry., del. Pgh. N. & S. sides	27.19	27.19	26.815	25.69
No. 2 foundry, Chicago	26.50	26.50	26.125	25.00
Southern No. 2, Birmingham	22.88	22.88	22.505	21.38
Southern No. 2 del. Cincinnati	28.94	28.94	28.565	25.44
No. 2 fdry., del. Philadelphia	28.34	28.34	27.965	26.84
Malleable, Valley	26.50	26.50	26.125	25.00
Malleable, Chicago	26.50	26.50	26.125	25.00
Charcoal, low phos., fob Lyles, Tenn.	33.00	33.00	33.000	33.00
Ferry forge, del. Pittsburgh	26.69	26.69	26.315	25.19
Ferromanganese, del. Pittsburgh	140.00	140.00	140.000	140.33

Scrap

	June 15 1946	May, 1946	Mar., 1946	June, 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	18.45
Heavy melting steel, Chicago	18.75	18.75	18.75	18.75
Rails for rolling, Chicago	22.25	22.25	22.25	22.25
No. 1 cast, Chicago	20.00	20.00	20.00	20.00

Coke

	June 15 1946	May, 1946	Mar., 1946	June, 1945
Connellsville, furnace ovens	\$7.50	\$7.50	\$7.50	\$7.50
Connellsville, foundry ovens	8.25	8.25	8.25	8.25
Chicago, by-product fdry., del.	13.75	13.75	13.75	13.35

Semifinished Material

	June 15 1946	May, 1946	Mar., 1946	June, 1945
Sheet bars, Pittsburgh, Chicago	\$38.00	\$38.00	\$38.00	\$36.00
Slabs, Pittsburgh, Chicago	39.00	39.00	39.00	36.00
Rerolling billets, Pittsburgh	39.00	39.00	39.00	36.00
Wire rods, No. 5 to 1 1/2-in., Pitts.	2.30c	2.30c	2.30c	2.15c

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Following are maximum prices established by OPA schedules, except those for stainless steels which are now exempt from price control. Price schedule No. 6 covers semifinished and finished iron and steel products; by-product foundry coke, No. 29; relaying rails, No. 46; heehive open coke, No. 77; bolts, nuts and rivets, No. 147; coke by-products, GMPR, except sulphate of ammonia, No. 205. Finished steel quoted in cents per pound and semifinished steel in dollars per gross ton, except as otherwise noted. Pricing on rails was changed to net ton basis as of Feb. 15, 1946.

Semifinished Steel

Carbon Steel Ingots: Fob mill base, rerolling quality, standard analysis, \$33.

Alloy Steel Ingots: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, uncorp. \$48.69.

Rerolling, Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, \$39; Detroit, del., \$41; Duluth (billets), \$41; Pac. ports (billets), \$51. (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; Duluth, billets, \$49; forging billets fob Pac. ports, \$59.

(Andrews Steel Co. may quote carbon forging billets \$50 gross ton at established basing points; Follansbee 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 \$60.43; eastern Mich. \$61.43.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, \$38. (Emple 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—1/2 in. inclusive, per 100 lb, \$2.30. Do., over 1/2—1 1/2 in., incl., \$2.45; Galveston, base, \$2.40 and \$2.55, respectively. Worcester add \$0.10; Pacific ports \$0.50.

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., 2.60c; eastern Mich., 2.65c; New York, del., 2.84c; Phila., del., 2.82c; Gulf ports, dock, 2.85c; Pac. ports, dock, 3.15c. (Sheffield Steel Corp., 2.75c, fob St. Louis) Joslyn Mfg. & Supply Co., may quote 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., 3.021c. (Texas Steel Co. may use Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

AISI Series	(°Basic O-II)	AISI Series	(°Basic O-H)
1300	\$0.108	4300	\$1.839
2300	1.839	4600	1.298
2500	2.759	4800	3.326
3000	0.541	5100	0.379
3100	0.999	5130 or 5151	0.494
3200	1.461	6120 or 6152	1.028
		6145 or 6150	1.298
		8612	0.793
3400	3.462	8720	0.757
4000	0.487	9830	1.407
4100 (15-25 Mo)	0.757		
(20-30 Mo)	0.812		

*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., 3.725c; eastern Mich., 3.755c.

Rerolling Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.35c; Detroit, del., 2.45c; eastern Mich. and Toledo,

2.50c; Gulf ports, dock, 2.70c; Pacific ports, dock, 2.75c.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo, base, 2.35c; Detroit, del., 2.45c; eastern Mich. and Toledo, del., 2.50c; Gulf ports, dock, 2.70c.

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., 2.525c; eastern Mich. del., 2.575c; Phila., del., 2.595c; New York, del., 2.665c; Pacific ports, 2.975c. (Andrews Steel Co. may quote hot-rolled sheets for shipment to the Detroit area on the Middletown, O., base; Alan Wood Steel Co., Conshohocken, Pa., may quote 2.60c on hot carbon sheets, nearest eastern basing point.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.275c; Granite City, base, 3.375c; Detroit, del., 3.375c; eastern Mich., del. 3.425c; New York, del., 3.615c; Phila., del., 3.595c; Pacific ports, 3.925c.

Galvanized Sheets, No. 24: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base, 4.05c; Granite City, base, 4.15c; New York, del., 4.29c; Phila., del., 4.22c; Pacific ports, 4.60c.

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, 4.60c; 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.

Enamelling Sheets: 10-gage; Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base 3.20c; Granite City, base 3.30c; Detroit, del., 3.30c; eastern Mich., 3.35c; Pacific ports, 3.85c.
20-gage: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base, 3.80c; Detroit, del., 3.90c; eastern Mich., 3.95c; Pacific ports, 4.45c.

Electrical Sheets No. 24:

	Pittsburgh	Pacific	Granite
	Base	Ports	City
Field grade	3.90c	4.65c	4.00c
Armature	4.25c	5.00c	4.35c
Electrical	4.75c	5.50c	4.85c
Motor	5.425c	6.175c	5.525c
Dynamo	6.125c	6.875c	6.225c
Transformer			
72	6.625c	7.375c	
65	7.525c	8.375c	
58	8.125c	8.875c	
52	8.925c	9.675c	

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Middletown, 6-in. and narrower: Base, 2.45c; Detroit, del., 2.55c; eastern Mich., del., 2.60c; Pacific ports, 3.10c. (Superior Steel Corp. may quote 3.30c, Pitts.)
Over 6-in.: Base, 2.35c; Detroit, del., 2.45c; eastern Mich., del., 2.50c; Pacific ports, 3.00c. (Superior Steel Corp. may quote 3.20c, Pitts.)

Cold-Rolled Strip: Pittsburgh, Cleveland, Youngstown, 0.23 carbon and less, 3.05c; Chicago, base, 3.15c; Detroit, del., 3.15c; eastern Mich., del., 3.20c; Worcester, base, 3.25c. (Superior Steel Corp. may quote 4.70c, Pitts.)

Cold-Finished Spring Steel: Pittsburgh, Cleveland base, 0.26-0.50 carbon, 3.05c. 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, 4.30c.

Long Ternes: Pittsburgh, Chicago, Gary, No. 24 unassorted, 4.05c; Pacific ports, 4.80c.
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; 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; New York, del., 2.69c; Phila., del., 2.55c; St. Louis, 2.74c; Boston, del., 2.82-3.07c; Pacific ports, 3.05c; Gulf ports, 2.85c. (Granite City Steel Co. may quote carbon plates 2.65c fob D.P.C. mill; Geneva Steel Co., Provo, Utah, 3.20c fob Pac. ports; 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, 4.40c; Gulf ports, 4.10c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, Coatesville, 3.787c; Gulf ports, 4.273c; Pacific ports, 4.49c.

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., 2.52c; Phila., del., 2.465c; Pacific ports, 3.00c; Gulf ports, 2.70c.

(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, 3.20c.

Wire and Wire Products
(Fob Pittsburgh, Chicago, Cleveland and Birmingham, per 100 pounds)

Wire to Manufacturers in carloads
Bright basic or bessemer \$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 \$0.50 for Pacific ports.
†Add \$0.30 for Worcester, \$0.50 for Pacific ports.

‡Add \$0.50 for Pacific ports.
§Add \$0.10 for Worcester, \$0.70 for Pacific ports.

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 Weld					
Steel			Iron		
In.	Blk.	Galv.	In.	Blk.	Galv.
3/4	53	30	1/2	21	0 1/2
1	56	37 1/2	3/4	27	7
1 1/4	60 1/2	48	1-1/4	31	13
1 1/2	63 1/2	52	1-1/2	35	15 1/2
1-3	65 1/2	54 1/2	2	34 1/2	15

Lap Weld					
Steel			Iron		
In.	Blk.	Galv.	In.	Blk.	Galv.
2	58	46 1/2	1 1/4	20	0 1/2
2 1/4-3	61	49 1/2	1 1/2	25 1/2	7
3 1/4-6	63	51 1/2	2	27 1/2	9
7-8	62	49 1/2	2 1/4-3 1/2	28 1/2	11 1/2
9-10	61 1/2	49	4	30 1/2	15
11-12	60 1/2	48	4 1/2-8	29 1/2	14
			9-12	25 1/2	9

Roller Tubes: Net base prices per 100 feet fob Pittsburgh in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

—Seamless— —Elec. Weld—

O.D.	Hot Rolled	Cold Drawn	Hot Rolled	Cold Rolled
1"	13	\$9.90	\$9.36	\$9.65
1 1/4"	13	11.73	9.63	11.43
1 1/2"	13	\$10.91	12.96	10.63
1 3/4"	13	12.41	14.75	12.10
2"	13	13.90	16.52	13.53
2 1/4"	13	15.50	18.42	15.06
2 1/2"	12	17.07	20.28	16.57
2 3/4"	12	18.70	22.21	18.11
3"	12	19.82	23.54	19.17
3 1/4"	12	20.79	24.71	20.05
3 1/2"	11	26.24	31.18	25.30
4"	10	32.56	38.68	31.32
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, \$54 per net ton, Birmingham; \$59, 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, 4.75c; heat treated, 5.00c. Tie plates \$51 net ton, base, Standard spikes, 3.65c.

* Fixed by OPA Schedule 46, Dec. 15, 1941.

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
18.00	4	1		72.49c
1.5	4		5.5	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

Rivets

Fob Pittsburgh, Cleveland, Chicago, Birmingham

Structural 3.75c
3/8-inch and under 65-5 off

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, 1cl \$2.75-\$3.00 off

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago. Additional discounts: 5 for carloads; 10 for full containers, except tire, step and plow bolts.
(Celling prices advanced 7 per cent, effective Apr. 1, 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., 1/2 to 1 x 6-in. and shorter 61 off

1 1/2 and larger, all lengths 59 off
All diameters, over 6-in. long 59 off
Tire bolts 50 off
Step bolts 56 off
Plow bolts 65 off

Stove Bolts
In packages, nuts separate, 71-10 off, nuts attached, 71 off; bulk, 80 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		64
1/2-in. and smaller	62	
3/4-in. and smaller		80
1/2-in.-1-in.	59	
3/4-in.-1-in.	57	58
1 1/4-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, 1/4-in. and larger 60 off
No. 10 and smaller 70 off

Stainless Steels

(Open market prices. OPA price control suspended Oct. 11, 1945.)
Base, Cents per lb

CHROMIUM NICKEL STEELS					
	Bars	Plates	Sheets	H. R. Strip	C. R. Strip
302	25.96c	29.21c	36.79c	23.93c	30.30c
303	27.13	31.38	38.95	29.21	35.71
304	28.05	31.38	38.95	25.45	32.48
308	31.38	36.79	44.36	30.84	37.87
309	38.95	43.28	50.85	40.03	50.85
310	53.02	58.26	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	24.33

STRAIGHT CHROMIUM STEEL					
	403	404	406	409	410
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	39.49
430	20.56	23.80	31.38	18.94	24.36
†440F	21.10	24.35	31.92	20.29	26.51
440A	25.96	30.84	36.25	25.70	39.49
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	39.49	37.87	56.28
501	8.66	12.98	17.04	12.98	18.38
502	9.74	14.07	18.12	14.07	19.48

STAINLESS CLAD STEEL (20%)
(Fob Pittsburgh and Washington, Pa., plate prices include annealing and pickling.)

304	19.48	20.56
410	17.31	18.39
430	17.85	18.94
446	19.48	20.56

* With 2-3% molybdenum. † With titanium. ‡ With columbium. ** With machining agent. †† High carbon. ††† Free machining.

Metallurgical Coke

Price Per Net Ton	
Beehive Ovens	
Connellsville, furnace	\$7.50
Connellsville, foundry	8.00-8.50
New River, foundry	9.00-9.25
Wise county, foundry	7.75-8.25
Wise county, furnace	7.25-7.75

By-Product Foundry	
Kearney, N. J., ovens	13.05
Chicago, outside delivered	13.00
Chicago, delivered	13.75
Terre Haute, delivered	13.50
Milwaukee, ovens	13.75
New England, delivered	14.63
St. Louis, delivered	13.75
Birmingham, delivered	10.90
Indianapolis, delivered	13.50
Cincinnati, delivered	13.25
Cleveland, delivered	13.20
Buffalo, delivered	13.46
Detroit, delivered	13.78
Philadelphia, delivered	13.28

* Operators of hand-drawn ovens using trucked coal may charge \$8.00; effective May 28, 1945, \$14.25 from other than Ala., Mo., Tenn.

Coke By-Products

Spot, gal, freight allowed east of Omaha	15.00c
Pure and 90% benzol	27.00c
Toluol, two degree	28.00c
Solvent naphtha	28.00c
Industrial xylol	28.00c
Per pound fob works	
Phenol (car lots, returnable drums)	10.50c
Do., less than carlots	11.25c
Do., tank cars	9.50c
Eastern plants, per pound	
Naphthalene flakes, balls, bbl, to jobbers	8.00c
Per ton, bulk, fob port	
Sulphate of ammonia	\$29.20

WAREHOUSE STEEL PRICES

Base delivered price, cents per pound, for delivery within switching limits, subject to established extras. Quotations based on OPA mill prices announced March 1, 1946.

	Hot-rolled bars	Structural shapes	Plates	Floor plates	Hot-rolled sheets (10-gage base)	Hot-rolled strip (14-gage and lighter, 6-in and narrower)	Hot-rolled strip (12-gage and heavier wider than 6-inch)	Galvanized flat sheets (24-gage base)	Cold-rolled sheets (17-gage base)	Cold finished bars	Cold-rolled strip
Boston	4.294 ¹	4.162 ¹	4.162 ¹	5.977 ¹	3.999 ¹	5.456 ¹	4.356 ¹	5.674 ¹⁴	4.969 ¹⁴	4.594 ¹⁴	4.965
New York	4.103 ¹	4.008 ¹	4.018 ¹	5.824 ¹	3.815 ¹	4.824 ¹	4.224 ¹	4.838 ¹⁴	4.838 ¹⁴	4.553 ¹⁴	5.024
Jersey City	4.103 ¹	3.997 ¹	4.018 ¹	5.824 ¹	3.815 ¹	4.824 ¹	4.224 ¹	4.838 ¹⁴	4.838 ¹⁴	4.553 ¹⁴	5.024
Philadelphia	4.072 ¹	3.916 ¹	3.855 ¹	5.768 ¹	3.743 ¹	4.822 ¹	4.522 ¹	5.097 ¹⁴	5.097 ¹⁴	4.032 ¹⁴	5.024
Baltimore	4.052 ¹	4.009 ¹	3.844 ¹	5.502 ¹	3.619 ¹	4.252 ¹	4.152 ¹	5.344 ¹	5.077 ¹⁴	4.502 ¹⁴	5.022
Washington	4.191 ¹	4.180 ¹	4.046 ¹	5.591 ¹	3.821 ¹	4.391 ¹	4.291 ¹	5.646 ¹⁷	5.066 ¹⁴	4.491 ¹⁴	5.022
Norfolk Va.	4.315 ¹	4.252 ¹	4.221 ¹	5.715 ¹	3.996 ¹	4.865 ¹	4.415 ¹	5.821 ¹⁷	4.490 ¹⁴	4.615 ¹⁴	5.022
Bethlehem, Pa.	.....	3.70 ¹	.....	.....	.....	.....	.....	.....	.....	.....	.....
Claymont, Del.	.....	3.70 ¹	.....	.....	.....	.....	.....	.....	.....	.....	.....
Coatesville, Pa.	.....	3.70 ¹	.....	.....	.....	.....	.....	.....	.....	.....	.....
Buffalo (city)	3.60 ¹	3.65 ¹	3.88 ¹	5.51 ¹	3.575 ¹	4.169 ¹	4.069 ¹	5.20 ¹⁵	4.625 ¹⁶	4.20 ¹⁵	4.919
Buffalo (country)	3.50 ¹	3.55 ¹	3.55 ¹	5.15 ¹	3.475 ¹	3.85 ¹	3.750 ¹	5.10 ¹⁵	4.525 ¹⁶	4.10 ¹⁵	4.60
Pittsburgh (city)	3.60 ¹	3.65 ¹	3.85 ¹	5.25 ¹	3.575 ¹	3.95 ¹	3.850 ¹	5.327 ¹⁵	4.625 ¹⁶	4.20 ¹⁵	4.70
Pittsburgh (country)	3.50 ¹	3.55 ¹	3.55 ¹	5.15 ¹	3.475 ¹	3.85 ¹	3.750 ¹	5.10 ¹⁵	4.525 ¹⁶	4.10 ¹⁵	4.60
Cleveland (city)	3.60 ¹	3.638 ¹	3.65 ¹	5.438 ¹	3.575 ¹	3.95 ¹	3.850 ¹	5.327 ¹⁵	4.625 ¹⁶	4.20 ¹⁵	4.70
Cleveland (country)	3.50 ¹	3.55 ¹	3.55 ¹	5.15 ¹	3.475 ¹	3.85 ¹	3.750 ¹	5.10 ¹⁵	4.525 ¹⁶	4.10 ¹⁵	4.60
Detroit	3.70 ¹	3.911 ¹	3.859 ¹	5.531 ¹	3.675 ¹	4.050 ¹	3.950 ¹	5.450 ¹⁵	4.725 ¹⁶	4.25 ¹⁵	4.909
Omaha (city, del.)	4.293 ¹	4.343 ¹	4.343 ¹	5.943 ¹	4.018 ¹	4.493 ¹	4.393 ¹	5.965 ¹⁵	5.068 ¹⁶	4.893 ¹⁵	.....
Omaha (country)	4.193 ¹	4.243 ¹	4.243 ¹	5.843 ¹	3.918 ¹	4.393 ¹	4.293 ¹	5.865 ¹⁵	.....	.....	.....
Cincinnati	3.861 ¹	3.941 ¹	3.911 ¹	5.541 ¹	3.650 ¹	4.025 ¹	3.925 ¹	5.275 ¹⁵	4.700 ¹⁶	4.461 ¹⁵	4.961
Youngstown	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Middletown, O.	.....	.....	.....	.....	.....	.....	.....	4.85 ¹⁵	.....	.....	.....
Chicago (city)	3.75 ¹	3.80 ¹	3.80 ¹	5.40 ¹	3.475 ¹	3.85 ¹	3.750 ¹	5.10 ¹⁵	.....	.....	.....
Milwaukee	3.887 ¹	3.937 ¹	3.937 ¹	5.537 ¹	3.475 ¹	3.95 ¹	3.850 ¹	5.40 ¹⁵	4.425 ¹⁶	4.20 ¹⁵	4.90
Indianapolis	3.83 ¹	3.88 ¹	3.88 ¹	5.48 ¹	3.612 ¹	4.087 ¹	3.987 ¹	5.722 ¹⁵	4.562 ¹⁶	4.337 ¹⁵	5.037
St. Paul	4.072 ¹	4.122 ¹	4.122 ¹	5.722 ¹	3.743 ¹	4.118 ¹	4.018 ¹	5.368 ¹⁵	4.793 ¹⁶	4.43 ¹⁵	5.030
St. Louis	3.897 ¹	3.947 ¹	3.947 ¹	5.547 ¹	3.797 ¹	4.272 ¹	4.172 ¹	5.635 ¹⁵	4.747 ¹⁶	4.811 ¹⁵	5.352
Memphis, Tenn.	4.265 ¹	4.315 ¹	4.315 ¹	6.03 ¹	4.190 ¹	4.565 ¹	4.465 ¹	5.622 ¹⁵	4.572 ¹⁶	4.481 ¹⁵	5.181
Birmingham	3.75 ¹	3.80 ¹	3.80 ¹	6.153 ¹	3.675 ¹	4.05 ¹	4.05 ¹	5.715 ¹⁵	5.005 ¹⁶	4.78 ¹⁵	.....
New Orleans (city)	4.358 ¹	4.408 ¹	4.408 ¹	6.329 ¹	4.283 ¹	4.658 ¹	4.568 ¹	5.20 ¹⁵	5.077 ¹⁶	4.99 ¹⁵	5.465
Houston, Tex.	4.00 ¹	4.50 ¹	4.50 ¹	5.75 ¹	3.988 ¹	4.663 ¹	4.563 ¹	5.808 ¹⁵	5.304 ¹⁶	5.073 ¹⁵	.....
Los Angeles	4.65 ¹	4.90 ¹	4.90 ¹	7.45 ¹	5.225 ¹	5.30 ¹	5.200 ¹	5.763 ¹⁵	5.819 ¹⁶	5.819 ¹⁵	.....
San Francisco	4.20 ¹	4.15 ¹	4.15 ¹	7.85 ¹	5.85 ¹	4.125 ¹	4.50 ¹	5.808 ¹⁵	5.304 ¹⁶	5.073 ¹⁵	.....
Portland, Ore.	4.70 ¹⁷	5.00 ¹⁷	5.00 ¹⁷	6.75 ¹⁷	4.875 ¹⁷	6.65 ¹⁷	5.000 ¹⁷	6.20 ¹⁵	6.825 ¹⁶	5.983 ¹⁵	5.863
Tacoma, Wash.	4.60 ¹	4.70 ¹	4.70 ¹	6.75 ¹	4.87 ¹	5.80 ¹	4.60 ¹	6.20 ¹⁵	6.825 ¹⁶	5.983 ¹⁵	.....
Seattle	4.60 ¹	4.70 ¹	4.70 ¹	6.75 ¹	4.87 ¹	5.80 ¹	4.60 ¹	6.40 ¹⁵	6.55 ¹⁶	6.23 ¹⁵	.....

* Basing point cities with quotations representing mill prices, plus warehouse spread; † open market price. NOTE—Ceiling prices fixed by Office of Price Administration in Revised Price Schedule No. 49, as amended. Deliveries outside above cities computed in accordance with regulations.

BASE QUANTITIES

¹—400 to 1999 pounds; ²—400 to 14,999 pounds; ³—any quantity; ⁴—300 to 1999 pounds; ⁵—400 to 8999 pounds; ⁶—300 to 9999 pounds; ⁷—100 to 39,999 pounds; ⁸—under 2000 pounds; ⁹—under 4000 pounds; ¹⁰—500 to 1499 pounds; ¹¹—one bundle to 39,999 pounds; ¹²—150 to 2249 pounds; ¹³—150 to 1499 pounds; ¹⁴—three to 24 bundles; ¹⁵—450 to 1499 pounds; ¹⁶—one bundle to 1499 pounds; ¹⁷—one to nine bundles; ¹⁸—one to six bundles; ¹⁹—100 to 749 pounds; ²⁰—300 to 1999 pounds; ²¹—1500 to 39,999 pounds; ²²—1500 to 1999 pounds; ²³—1000 to 39,999 pounds; ²⁴—400 to 1499 pounds; ²⁵—1000 to 1999 pounds; ²⁶—under 25 bundles. Cold-rolled strip, 2000 to 39,999 pounds, base; ²⁷—300 to 4999 pounds.

Ores	Indian and African	Rhodesian	Utah, and Pueblo, Colo., 91c; prices include duty on imported ore and are subject to premiums, penalties and other provisions of amended MPR No. 248, effective May 15, 1944. Price at basing points which are also points of discharge of imported manganese ore is for cars, shipside, at dock most favorable to the buyer. Outside shipments direct to consumers at 10c per unit less than Metal Reserve prices.
Lake Superior Iron Ore	48% 2.8:1 \$39.75	45% no ratio \$28.30	Molybdenum Sulphide conc., lb. Mo. cont., mines \$0.75
Gross ton, 51 1/2% (Natural)	48% 3:1 41.00	48% no ratio 31.00	
Lower Lake Ports	48% no ratio 31.00	48% 3:1 lump 41.00	
Old range bessemer \$4.95	South African (Transvaal)	Domestic (seller's nearest rail)	
Mesabi nonbessemer 4.55	44% no ratio \$27.40	48% 3:1 \$43.50	
High phosphorus 4.55	45% no ratio 28.30	less \$7 freight allowance.	
Mesabi bessemer 4.70	48% no ratio 31.00		
Old range nonbessemer 4.80	50% no ratio 32.80		
Eastern Local Ore	Brazilian—nominal	Manganese Ore	
Cents, units, del. E. Pa.	44% 2.5:1 lump \$33.65	Sales prices of Office of Metals Reserve, cents per gross ton unit, dry, 48%, at New York, Philadelphia, Baltimore, Norfolk, Mobile and New Orleans, 85c; Fontana, Calif., Provo,	
Foundry and basic 56-63% contract 13.00	48% 3:1 lump 43.50		
Foreign Ore			
Cents per unit, cif Atlantic ports			
Manganiferous ore, 45-55% Fe., 6-10% Mn. Nom.			
N. African low phos. Nom.			
Swedish basic, 60 to 68% Sph. Nom.			
Spanish, N. African basic, 50 to 60% Nom.			
Brazil iron ore, 68-69% fob Rio de Janeiro ... 7.50-8.00			

NATIONAL EMERGENCY STEELS (Hot Rolled)

	Designation	Chemical Composition Limits, Per Cent						Basic open-hearth Electric furnace			
		Carbon	Mn	Si	Cr	Ni	Mo	Bars per 100 lb.	Billets per GT	Bars per 100 lb.	Billets per GT
Chinese Tungsten Ore	NE 9415	.13-.18	.80-1.10	.20-.35	.30-.50	.30-.60	.08-.15	\$0.812	\$16.230	\$1.353	\$27.050
Wolframite, per short ton unit, duty paid	NE 9425	.23-.28	.80-1.20	.20-.35	.30-.50	.30-.60	.08-.15	.812	16.230	1.353	27.050
Chrome Ore	NE 9442	.40-.45	1.00-1.30	.20-.35	.30-.50	.30-.60	.08-.15	.866	17.312	1.407	28.132
(Equivalent OPA schedules):	NE 9722	.20-.25	.50-.80	.20-.35	.10-.25	.40-.70	.15-.25	.703	14.066	1.244	24.886
Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Ore., or Tacoma, Wash.	NE 9912	.10-.15	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.298	25.968	1.677	33.542
(S paying for discharge; dry basis, subject to penalties if guarantees are not met.)	NE 9920	.18-.23	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.298	25.968	1.677	33.542

Extras are in addition to a base price of 2.921c, per pound on finished products and \$58.43 per gross ton on semifinished steel major basing points and are in cents per pound and dollars per gross ton. No prices quoted on vanadium alloy.

Pig Iron

Maximum prices per gross ton fixed by OPA schedule No. 20, last amended March 15, 1946; placed on adjustable pricing basis May 29, 1946. Producers may collect present ceiling prices on deliveries after that date, subject to condition that purchaser agrees to pay also amount of any increase that may be granted later by OPA. Federal tax on freight charges, effective Dec. 1, 1942, not included.

	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	\$27.50	\$27.00	\$28.50	\$28.00
Newark, N. J., del.	29.03	28.53	30.03	29.53
Brooklyn, N. Y., del.	30.00	29.50	31.00	30.50
Birdsboro, Pa., base	27.50	27.00	28.50	28.00
Birmingham, base	22.88	21.50	27.50	27.00
Baltimore, del.	28.11	27.61	29.11	28.61
Boston, del.	27.64	27.14	28.64	28.14
Chicago, del.	26.72	26.22	27.72	27.22
Cincinnati, del.	26.94	26.44	27.94	27.44
Cleveland, del.	26.62	26.12	27.62	27.12
Newark, N. J., del.	28.64	28.14	29.64	29.14
Philadelphia, del.	27.96	27.46	28.96	28.46
St. Louis, del.	26.62	26.12	27.62	27.12
Buffalo, base	26.50	26.00	27.50	27.00
Boston, del.	28.00	27.50	29.00	28.50
Rochester, del.	28.03	27.53	29.03	28.53
Syracuse, del.	28.58	28.08	29.58	29.08
Chicago, base	26.50	26.00	27.00	26.50
Milwaukee, del.	27.60	27.10	28.10	27.60
Muskegon, Mich., del.	27.69	27.19	28.19	27.69
Cleveland, base	26.50	26.00	27.00	26.50
Akron, Canton, del.	27.89	27.39	28.39	27.89
Detroit, base	26.50	26.00	27.00	26.50
Saginaw, Mich., del.	28.81	28.31	29.31	28.81
Duluth, base	27.00	26.50	27.50	27.00
St. Paul, del.	29.13	28.63	29.63	29.13
Eric, Pa., base	26.50	26.00	27.00	26.50
Everett, Mass., base	27.50	27.00	28.00	27.50
Boston, del.	28.00	27.50	28.50	28.00
Granite City, Ill., base	26.50	26.00	27.00	26.50
St. Louis, del.	27.00	26.50	27.50	27.00
Hamilton, O., base	26.50	26.00	27.00	26.50
Cincinnati, del.	27.61	27.11	28.11	27.61
Neville Island, Pa., base	26.50	26.00	27.00	26.50
*Pittsburgh, del. N. & S. sides	27.19	26.69	27.69	27.19
Provo, Utah, base	24.50	24.00	25.00	24.50
Sharpsville, Pa., base	26.50	26.00	27.00	26.50
Sparrows Point, base	27.50	27.00	28.00	27.50
Baltimore, del.	28.49	27.99	28.99	28.49
Steelton, Pa., base	27.00	26.50	27.50	27.00
Swedeland, Pa., base	27.50	27.00	28.00	27.50
Philadelphia, del.	28.34	27.84	28.84	28.34
Toledo, O., base	26.50	26.00	27.00	26.50
Youngstown, O., base	26.50	26.00	27.00	26.50
Mansfield, O., del.	28.44	27.94	28.94	28.44

*To Neville Island base add: 55 cents for McKees Rocks, Pa.; 84 cents, Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Alliquippa; 97 cents (water), Monongahela; \$1.11, Oakmont, Verona; \$1.24, Brackenburg.

Exception to Ceiling 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.

High Silicon, Silvery

6.00-6.50 per cent (base) ... \$32.00;
 6.51-7.00 ... \$33.00 9.01-9.50 ... 38.00
 7.01-7.50 ... 34.00 9.51-10.00 ... 39.00
 7.51-8.00 ... 35.00 10.01-10.50 ... 40.00
 8.01-8.50 ... 36.00 10.51-11.00 ... 41.00
 8.51-9.00 ... 37.00 11.01-11.50 ... 42.00
 Fob Jackson county, O., per gross ton; Buffalo base \$1.25 higher. Buyer may use whichever base is more favorable.

Electric Furnace Ferro-silicon: Si 14.01 to 14.50%, \$45.50 Jackson co.; each additional 0.50% silicon up to and including 18% add \$1; low impurities not exceeding 0.005 P, 0.40 Si, 1.0% C, add \$1.

Bessemer Ferro-silicon

Prices same as for high silicon silvery iron, plus \$1 per gross ton.

Charcoal 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. \$26.00
 Valley base 28.00

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Buffalo, N. Y., \$32.00 base; \$33.24, del. Philadelphia. Intermediate phosphorus, Central Furnace, Cleveland, \$29.00.

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, of 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. \$76.05

High Heat Duty

Pa., Ill., O., Md., Mo., Ky. 60.40
 Ala., Ga. 60.40
 N. J. 65.90

Intermediate Heat Duty

Ohio 50.60
 Pa., Ill., Md., Mo., Ky. 54.80
 Ala., Ga. 49.15
 N. J. 54.80

Low Heat Duty

Pa., Md., Ohio 42.35

Malleable Bung Brick

All bases 70.45

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry Press 36.45
 Wire Cut 34.15

Silica Brick

Pennsylvania 60.40
 Joliet, E. Chicago 69.30
 Birmingham, Ala. 60.40

Magnesite

Domestic dead-burned grains, net ton fob Chewelah, Wash., net ton, bulk 22.00
 net ton, bags 26.00

Basic Brick

Net ton, fob Baltimore, Plymouth Meeting, Chester, Pa.
 Chrome brick 54.00
 Chem. bonded chrome 54.00
 Magnesite brick 78.00
 Chem. bonded magnesite 65.00

Fluorspar

Metallurgical grade, fob Ill., Ky., net tons, carloads, CaF₂ content, 70% or more, \$33; 65 but less than 70%, \$32; 60 but less than 65%, \$31; less than 60%, \$30. After Aug. 29, 1944, base price any grade \$30.00.

Ferroalloy Prices

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 3¢ 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, 21.05c; 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 0.06% P.

Silegelsien: 19-21% carlot per gross ton, Palmerton, Pa., \$36; Pittsburg, \$40.50; Chicago, \$40.60. 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 1/4¢ for hydrogen-removed metal.

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 82.50c; western 82.25c and 84.75c; fob shipping point, freight allowed.
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 1c 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 1c 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.

High nitrogen, low carbon ferrocrome: Add 2c to low carbon ferrocrome prices. For higher nitrogen carbon, add 2c for each 0.25% of nitrogen over 0.75%.
Special Foundry Ferrocrome (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 1c 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 Si 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 1c for c.i. and 1.85c 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 20.45c, ton lots 21.00c, less ton lots 22.00c, eastern, freight allowed, per pound contained chromium, 20.40c, 20.85c, 21.65c and 22.65c, central; 21.00c, 21.45c, 22.85c and 23.85c, 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.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and H 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.

CMSZ 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.

CMSZ 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, 13.00c, central; 13.25c, 13.75c, 14.50c and 15.00c, western; spot up 0.25c.

Ferro-Boron: (B 17.50% min., Si 1.50% max., Al 0.50% max. and C 0.50% max.) per lb of alloy contract 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.
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.

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.

Vanadium Oxide: (Fused; Vanadium oxide 85-88%, sodium oxide approx. 10% and calcium oxide approx. 2%, or Red Cake; Vanadium oxide 85% approx., sodium oxide, approx. 9% and water approx.

2.5%) Contract, any quantity, \$1.10 eastern, freight allowed per pound vanadium oxide contained; contract carlots, \$1.105, less carlots, \$1.108, central; \$1.118 and \$1.133, western; spot add 5c to contracts in all cases.

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-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.

Briquets, Ferromanganese: (Weight approx. 3 lb and containing exactly 2 lb Mn) per lb of briquets. Contract, carlots, bulk 0.0605c, packed 0.063c, tons 0.0655c, less 0.068c eastern freight allowed; 0.063c, 0.0655c, 0.0755c and 0.078c, central; 0.066c, 0.0685c, 0.0855c and 0.088c, western; spot up 0.25c.

Briquets, Ferrochrome: Containing exactly 2 lb Cr, packed, eastern zone, c.l. 9.50c, ton lots 9.80c, less than ton 10.10c, central zone, add 0.3c for c.l. and 0.5c for smaller lots; western zone, add 0.70c for c.l. and 0.20c for smaller lots. Deduct 0.30c for bulk carlots. Prices per lb of briquets; spot prices 0.25c higher.

Silicomanganese, 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 f.o.b. shipping point, freight allowed; spot prices 0.25c higher. Deduct 0.30c for bulk carlots.

Ferromolybdenum: 55-75% per lb contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Ferrophosphorus: 17-19%, based on 18% P content, with untillage of \$3 for each 1% of P above or below the base; gross tons per carload fob seller's works, with freight equalized with Rockdale, Tenn.; contract price \$58.50, spot \$62.25.

Ferrosilicon: Contract, lump, packed; eastern zone, 90-95%, low aluminum grade, c.l. 13.30c, ton lots 13.75c, smaller lots 14.15c; 90-95% c.l. 12.65c, ton lots 13.10c, smaller lots 13.50c; 80-90%, low aluminum grade, c.l. 11.05c, ton lots 11.55c, smaller lots 12.05c; 80-90% c.l. 10.35c, ton lots 10.85c, smaller lots 11.35c; 75%, low aluminum grade, c.l. 10.15c, ton lots 10.70c, smaller lots 11.20c; 75% c.l. 9.40c, ton lots 9.95c, smaller lots 10.45c; 65%, low aluminum grade, c.l. 10.10c, ton lots 10.70c, smaller lots 11.20c; 50%, low aluminum grade, c.l. 9.20c, ton lots 9.80c, smaller lots 10.40c; 50%

c.l. 7.90c, ton lots 8.50c, smaller lots 9.10c. Prices are fob shipping point, freight allowed, per lb of contained Si. Spot prices 0.25c higher. Deduct 0.85c for bulk carlots.

Grainal: Vanadium Grainal No. 1 \$7.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

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.

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.

Ferrotungsten: Spot 10,000 lb or more, per lb contained W, \$1.90; contract, \$1.85; freight allowed as far west as St. Louis.

Tungsten Metal Powder: Spot, not less than 97%, \$2.50-\$2.60; freight allowed as far west as St. Louis.

Ferrotitanium: 40-45%, R.R. freight allowed, per lb contained Ti; ton lots \$1.23; less-ton lots \$1.25; eastern. Spot up 5c per lb.

Ferrotitanium: 20-25%, 0.10 maximum carbon; per lb contained Ti; ton lots \$1.35; less-ton lots \$1.40 eastern. Spot up 5c per lb.

High-Carbon Ferrotitanium: 15-20% contract basis, per net ton, fob

Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C \$142.50; 3-5% C \$157.50.

Carbortam: 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.

Bortam: B 1.5-1.9%, ton lots, 45c lb; less-ton lots, 50c lb.

Ferrovandium: Va 35-55%, contract basis, per lb contained Va, fob producers plant with usual freight allowances; open-hearth grade \$2.70; special grade \$2.80; highly-special grade \$2.90.

Zirconium Alloys: Zr 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 1/4c 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.

Alsiifer: (Approx. 20% Al, 40% Si, 40% Fe) contract basis fob Niagara Falls, N. Y., lump, per lb 5.50c; ton lots 6.00c. Spot up 1/4c.

Siminal: (Approx. 20% each Si, Mn, Al) Contract, freight not exceeding St. Louis rate allowed, per lb alloy; carlots 8c; ton lots 8.75c; less-ton lots 9.25c.

Borasil: 3 to 4% B, 40 to 45% Si, \$6.25 lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Following prices are quotations developed by editors of STEEL in the various centers. For complete OPA ceiling price schedule refer to maximum price regulation No. 4. Quotations are on gross tons.

PHILADELPHIA:

(Delivered consumer's plant)	
No. 1 Heavy Melt. Steel	\$18.75
No. 2 Heavy Melt. Steel	18.75
No. 2 Bundles	18.75
No. 3 Bundles	16.75
Mixed Borings, Turnings	13.75
Machine Shop Turnings	13.75
Billet, Forge Crops	23.75
Bar Crops, Plate Scrap	21.25
Cast Steel	21.25
Punchings	21.25
Elec. Furnace Bundles	19.75
Heavy Turnings	18.25
Cast Grades	
(Fob Shipping Point)	
Heavy Breakable Cast	16.50
Charging Box Cast	19.00
Cupola Cast	20.00
Unstripped Motor Blocks	17.50
Malleable	22.00
Chemical Borings	16.51

NEW YORK:

(Dealers' buying prices)	
No. 1 Heavy Melt. Steel	\$15.33
No. 2 Heavy Melt. Steel	15.33
No. 2 Hyd. Bundles	15.33
No. 3 Hyd. Bundles	13.33
Chemical Borings	14.33
Machine Turnings	10.33
Mixed Borings, Turnings	10.33
No. 1 Cupola	20.00
Charging Box	19.00
Heavy Breakable	16.50
Unstripped Motor Blocks	17.50
Stove Plate	19.00

BOSTON:

(Fob shipping points. Boston differential 99c higher, steelmaking grades; Providence, \$1.09 higher)	
No. 1 Heavy Melt. Steel	\$14.06
No. 2 Heavy Melt. Steel	14.06
No. 1 Bundles	14.06
No. 2 Bundles	14.06
No. 1 Bushelling	14.06
Machine Shop Turnings	9.06
Mixed Borings, Turnings	9.06
Short Shovel Turnings	11.06
Chemical Borings	13.31
Low Phos. Clippings	16.56
No. 1 Cast	20.00
Clean Auto Cast	20.00
Stove Plate	19.00
Heavy Breakable Cast	16.50

RUFFALO:

(Delivered consumer's plant)	
No. 1 Heavy Melt. Steel	\$19.25
No. 2 Heavy Melt. Steel	19.25
No. 1 Bundles	19.25
No. 2 Bundles	19.25
No. 1 Bushelling	19.25

Machine Turnings	14.25
Short Shovel Turnings	16.25
Mixed Borings, Turn.	14.25
Cast Iron Borings	15.25
Low Phos.	21.75

PITTSBURGH:

(Delivered consumer's plant)	
Railroad Heavy Melting	\$21.00
No. 1 Heavy Melt. Steel	20.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Comp. Bundles	20.00
No. 2 Comp. Bundles	20.00
Short Shovel Turnings	17.00
Mach. Shop Turnings	15.00
Mixed Borings, Turnings	15.00
No. 1 Cupola Cast	\$20.00
Heavy Breakable Cast	\$16.50
Cast Iron Borings	16.00
Billet, Bloom Crops	25.00
Sheet Bar Crops	22.50
Plate Scrap, Punchings	22.50
Railroad Specialties	24.50
Scrap Rall	21.50
Axles	26.00
Rall 3 ft. and under	23.50
Railroad Malleable	22.00
* Shipping point.	

CLEVELAND:

(Delivered consumer's plant)	
No. 1 Heavy Melt. Steel	\$19.50
No. 2 Heavy Melt. Steel	19.50
No. 1 Comp. Bundles	19.50
No. 2 Comp. Bundles	19.50
No. 1 Bushelling	19.50
Mach. Shop Turnings	14.50
Short Shovel Turnings	16.50
Mixed Borings, Turnings	14.50
No. 1 Cupola Cast	20.00
Heavy Breakable Cast	16.50
Cast Iron Borings	13.50-14.00
Billet, Bloom Crops	24.50
Sheet Bar Crops	22.00
Plate Scrap, Punchings	22.00
Elec. Furnace Bundles	20.50

VALLEY:

(Delivered consumer's plant)	
No. 1 R.R. Heavy Melt.	\$21.00
No. 1 Heavy Melt. Steel	20.00
No. 1 Comp. Bundles	20.00
Short Shovel Turnings	17.00
Cast Iron Borings	16.00
Machine Shop Turnings	15.00
Low Phos. Plate	22.50

MANSFIELD:

(Delivered consumer's plant)	
Machine Shop Turnings	\$15.00

CINCINNATI:

(Delivered consumer's plant)	
No. 1 Heavy Melt. Steel	\$19.50
No. 2 Heavy Melt. Steel	19.50

No. 1 Comp. Bundles	19.50
No. 2 Comp. Bundles	19.50
Machine Turnings	10.50-11.00
Shovelling Turnings	12.50-13.00
Cast Iron Borings	11.50-12.00
Mixed Borings, Turnings	10.50-11.00
No. 1 Cupola Cast	20.00
Breakable Cast	16.50
Low Phosphorus	21.00-22.00
Scrap Ralls	20.50-21.00
Stove Plate	18.50-19.00

DETROIT:

(Delivered consumer's plant)	
Heavy Melting Steel	\$17.32
No. 1 Bushelling	17.32
Hydraulic Bundles	17.32
Flashings	17.32
Machine Turnings	12.32
Short Shovel, Turnings	14.32
Cast Iron Borings	13.32
Low Phos. Plate	19.82
No. 1 Cast	20.00
Heavy Breakable Cast	16.50

CHICAGO:

(Delivered consumer's plant; cast grades fob shipping point; railroad grades fob tracks)	
No. 1 R.R. Heavy Melt.	\$19.75
No. 1 Heavy Melt. Steel	18.75
No. 2 Heavy Melt. Steel	18.75
No. 1 Ind. Bundles	18.75
No. 2 Dir. Bundles	18.75
Baled Mach. Shop Turn.	18.75
No. 3 Galv. Bundles	16.75
Machine Turnings	13.75
Mix. Borings, Sht. Turn.	13.75
Short Shovel Turnings	15.75
Cast Iron Borings	14.75
Scrap Ralls	20.25
Cut Ralls, 3 feet	22.25
Cut Ralls, 18-inch	23.50
Rerolling Ralls	22.25
Angles, Splice Bars	22.25
Plate Scrap, Punchings	21.25
Railroad Specialties	22.75
No. 1 Cast	20.00
R.R. Malleable	22.00

ST. LOUIS:

(Delivered consumer's plant; cast grades fob shipping point)	
Heavy Melting	\$17.50
No. 1 Locomotive Tires	21.00
Misc. Ralls	19.00
Railroad Springs	22.00
Bundled Sheets	17.50
Axle Turnings	17.00
Machine Turnings	10.50
Shovelling Turnings	12.50
Rerolling Ralls	21.00

Street Car Axles	24.50
Steel Ralls, 3 ft.	21.50
Steel Angle Bars	21.00
Cast Iron Wheels	20.00
No. 1 Machinery Cast	20.00
Railroad Malleable	22.00
Breakable Cast	16.50
Stove Plate	19.00
Grate Bars	15.25
Brake Shoes	15.25

BIRMINGHAM:

(Delivered consumer's plant)	
Billet Forge Crops	\$22.50
Structural, Plate Scrap	19.00
Scrap Ralls Random	18.50
Rerolling Ralls	20.50
Angle Splice Bars	20.50
Solid Steel Axles	24.00
Cupola Cast	20.00
Stove Plate	19.00
Long Turnings	11.00
Cast Iron Borings	13.00
Iron Car Wheels	20.00

LOS ANGELES:

(Delivered consumer's plant)	
No. 1 Heavy Melt. Steel	\$14.00
No. 2 Heavy Melt. Steel	13.00
No. 1, 2 Dir. Bundles	12.00
Machine Turnings	5.50
Mixed Borings, Turnings	5.50
No. 1 Cast	20.00

SAN FRANCISCO:

(Delivered consumer's plant)	
No. 1 Heavy Melt. Steel	\$17.00
No. 2 Heavy Melt. Steel	17.00
No. 1 Bushelling	17.00
No. 1, No. 2 Bundles	17.00
No. 3 Bundles	9.00
Machine Turnings	7.00
Billet, Forge Crops	15.50
Bar Crops, Plate	15.50
Cast Steel	15.50
Cut, Structural, Plate 1 ft and under	18.00
Alloy-free Turnings	7.00
Tin Can Bundles	14.00
No. 2 Steel Wheels	21.50
Iron, Steel Axles	24.00
No. 2 Cast Steel	20.50
Uncut Frogs, Switches	18.00
Scrap Ralls	18.50
Locomotive Tires	20.50

SEATTLE:

(Delivered consumer's plant)	
No. 1 Heavy Melt. Steel	\$14.12
No. 2 Heavy Melt. Steel	14.12
Heavy Railroad Scrap	14.50
(Fob shipping point)	
No. 1 Cupola Cast	20.00

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) 15.25c; 88-10-2 (No. 215) 18.50c; 80-10-10 (No. 305) 18.00c; No. 1 yellow (No. 405) 12.25c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than 20 tons.

Zinc: Prime western 8.25c, select 8.35c, brass special 8.50c, intermediate 8.75c, high grade 9.25c, E. St. Louis, for carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.40c; under 2000 lb 0.50c.

Lead: Common 8.10c, chemical, 8.20c, corroding, 8.20c, E. St. Louis for carloads; 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., plus 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) 11.00c; No. 12 foundry alloy (No. 2 grade) 10.75-11.00c; steel deoxidizing grades, notch bars, granulated or shot; Grade 1 (95-97½%) 12.50c; grade 2 (92-95%) 11.50c; grade 3 (90-92%) 10.00-10.25c; grade 4 (85-90%) 9.25-9.50c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 1000-10,000 lb; 1c 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 lbs, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Stralts), 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, \$101-\$103 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 90.00c lb, del.; anodes, balls, discs and all other special or patented shapes 95.00c lb del.

Cobalt: 97-99%, \$1.50 lb, for 550 lb (bbl.); \$1.52 lb for 100 lb (case); \$1.57 lb under 100 lb.

Indium: 99.9%, \$2.25 per troy ounce.

Gold: U. S. Treasury, \$35 per ounce.

Silver: Open market, N. Y. 70.625 per ounce.

Platinum: \$53-\$56 per ounce.

Palladium: \$24 per troy ounce.

Iridium: \$110 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 28.53c; manganese bronze 32.01c; 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 25.95c; 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, 23.30c, 15,000 lb or more 23.55c, less carlots 24.05c.

Aluminum Sheets and Circles: 2s and 3s flat mill finish, base 30,000 lbs 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, 13.15c; 36,000 lb and over deduct 7%; Ribbon and strip 12.25c, 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 11.00c; 1-3 tons 12.00c; 500-2000 lb 12.50c; 100-500 lb 13.00c; under 100 lb 14.00c. Hull plate (over 12") add 1c to boiler plate prices.

PLATING MATERIALS

Chronic Acid: 99.75%, flake, del., carloads 16.25c; 5 tons and over 16.75c; 1-5 tons 17.25c; 400 lbs to 1 ton 17.75c; under 400 lbs 18.25c.

Copper Anodes: Base 2000-5000 lbs, del.; oval 17.62c; untrimmed 18.12c; electro-deposited 17.37c.

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: 500-2099 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 lbs 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 Grassell, 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 lbs fob shipping point. Add ¼c for 15,000-40,000 lbs; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	12.000	12.000	11.250
Tinned copper	10.500	10.500	.....
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	.....
Muntz 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 lbs of one group and ¼c for 20,000 lbs of second group shipped in same car. Typical prices follow:

(Group 1) No. 1 heavy copper and wire, No. 1 tinned copper, 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; babbit-lined 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 7.25c, old zinc 5.75c, fob point of shipment, add ¼c for 10,000 lb or more. New die cast scrap 4.95c, radiator grilles 4.95c, add ¼c for 20,000 lb or more. Unsweated zinc dress, die cast slab 5.80c, any quantity.

Nickel, Monel Scrap: Prices fob point of shipment; add ¼c for 2000 lbs or more of nickel or cupro-nickel shipped at one time and 20,000 lbs or more of Monel. Converters (dealers) allowed 2c premium.

Nickel: 98% or more nickel and not over ½c 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; soldered sheet 18.00c.

Sheets, Strip . . .

Sheet & Strip Prices, Page 164

Any hope of placing sheet and strip orders for delivery this year has practically disappeared, most mills being booked solidly for the entire year. Quotas for third quarter are being reduced by the tonnage in carryover from second quarter in many cases. Many consumers plan to close for part of the summer to allow mill shipments to build inventories to a point where production can be carried on economically.

New York — Scarcity of sheets will continue to cripple operations at metal fabricating plants in this district for some time. Not only will many programs originally conceived have to be revised, but even normal operations. Various fabricators, it is said, will likely suspend operations from one to four weeks this summer, because they have already used up most of their inventories and probably will be unable to obtain sufficient supplies for some time to operate economically.

Cincinnati — Sheet mills in this district have completed third quarter schedules in which nearly half of the tonnage is carryover from the current quarter. Normal quarter allocations to old customers have therefore been trimmed to allow for the carryover.

Cleveland—Flat rolled steel producers here have been sold for 1946 delivery for weeks and have not opened 1947 books. At least six weeks' production was lost during first half and, since orders had been accepted by many sellers for delivery through the yearend based on a larger output than can be attained, considerable tonnage must be carried over into next year. Producers who are selling on a quota basis have drastically reduced their third quarter tonnages. In many instances customers will receive only the tonnage which had been promised for second quarter. These producers hope they can establish normal fourth quarter quotas and can maintain shipments during that period on schedule.

Boston — Production of narrow cold strip is still restricted, due to lack of hot-rolled material, with inventories depleted and unbalanced. Rerollers expect spasmodic operations through the summer or until hot-rolled supply again is near normal. Efforts of cold strip producers to maintain schedules are stymied and consumer stocks are low, affecting operations in more cases. Carryover in strip has reached record proportions. Some sheet mills are asking cancellations on a good part of orders not entered, for which scheduling this year is doubtful. Some consumers are resisting this but most acquiesce. Third quarter sheet production will be mainly on carryovers, with mills filled through the year, with heavy carryover into first quarter. Producers are screening orders in rescheduling and in some instances where quotas are operating are revising allocations.

Philadelphia—Sheet sellers see little prospect for catching up on commitments for several months. One large independent is so far behind that a general revision of schedules is imminent. Most makers will be fortunate if carryover at the year end, is less than two to three months. Washington has reimposed distribution controls on some critical items for third quarter, including steel for the housing program and housing



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appliances, such as stoves and furnaces.
Pittsburgh — Steady upward trend is shown in sheet and strip output. It is still uncertain whether the recent sheet bar subsidy to aid nonintegrated sheet producers will develop into a broad program in other raw materials. Carryover by mills represents about three months capacity. On galvanized, hot-rolled pickled and cold-reduced sheets most mills have tonnage for the remainder of the year and most are not opening books for 1947.

Chicago — No sheetmaker in this district is in position to consider tonnage for this year and none has officially opened books for 1947. It is expected that some of the tonnage on books currently will be scaled down as manufacturing plants revise operations.

Steel Bars . . .

Bar Prices, Page 164

Barmakers generally find third quarter capacity completely covered, recent opportunity to place some large sizes for September delivery having disappeared. Some makers can take limited tonnage of larger sizes for fourth quarter, but this is becoming less possible. In smaller sizes mills are booked for the year and will have a carryover into 1947.

New York — All third quarter hot carbon bar capacity has now disappeared, regardless of specification. Until recently some larger sizes of hot carbon flats and rounds could be placed for September delivery. At present hot carbon bars, ranging from 1½ to 3½ inches and over, can be had in some quarters for delivery in fourth quarter, beginning with October; and certain producers are out of the market for that period on even these larger sizes. As for hot carbon bars smaller than 1½ inches, not only is no tonnage available against new orders for delivery this year, but there is in prospect a substantial carryover into 1947.

Sellers of cold-drawn bars, at least some, are in position to accept tonnage for fourth quarter shipment on specifications ranging from ½ to 6 inches; on smaller sizes they are booked up for the year, with a likely sizable carryover in prospect, as is probable in case of the small sizes of hot-rolled carbon bars. Hot alloy bars can be had in August, with cold alloy bars quoted on about the same basis as cold-finished carbon bars.

St. Louis — Merchant bar rolling schedules are filled to the year end and further orders are being accepted only for indefinite delivery. Tight allocations are being maintained and only emergency business is being accepted. Some rolling capacity is open in November and December for reinforcing bars but supply of rails for rolling is uncertain, billets being used for other products. Production is at capacity, furnace repairs being completed. Small rounds are tightest, though all sizes are booked far ahead.

Cleveland—Leading sellers are out of the market on carbon bars for this year. Stainless steel bars, however, are in comparatively good supply with third quarter still available. Sellers are accepting orders cautiously, however, so that they will be able to take care of their regular customers fully in case demand increases

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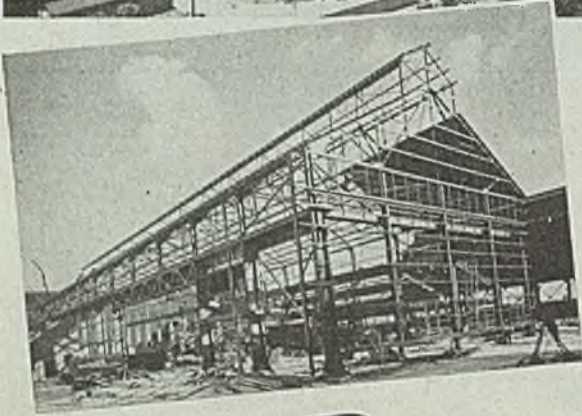
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later in the year. Some cancellations have been received for third quarter since some customers have been unable to increase operations to expected levels. Prices for alloy bars, except stainless, were increased last week, effective June 11, 8.2 per cent above base period prices. An increase of 4 per cent had been in effect since Feb. 15.

Philadelphia—Alloy bar deliveries average seven to eight weeks, while carbon bars are much further advanced. On hot carbon bars producers generally can offer nothing for this year except in wide flats and large rounds, the latter two inches and over. On the large sizes some tonnage can be accepted for late fourth quarter. Cold-drawn carbon bars are in much the same position.

Pittsburgh — Cold-finishers have been able to increase output somewhat, reflecting gradual improvement in mill shipments. However, it will not be until late this month before stocks are balanced sufficiently to attain normal production. Long expected upward revision in alloy prices was announced last week, raising the recent 4 per cent increase to 8.2 per cent over the former base prices, plus extras. In the interim producers have been billing customers at the old price, with the understanding that a rebilling will be made covering final decision as to extent of the advance. Deliveries on alloy bars are extended into late July and August, but on small carbon bars producers are booked through remainder of this year with larger sizes available early in fourth quarter.

Boston — Except for a few larger sizes mills are out of the market for carbon bars and cold-drawn and consumers, notably forge shops, are short of stock. Alloys are less scarce, although some small sizes in cold-finished are sold well through the year. Standard grades of hot-rolled stainless are available in three to four weeks and cold drawn in six to eight weeks. Backlog congestion is heaviest in smaller carbon sizes, for which demand and consumption is greatest in this district.

Steel Plates . . .

Plate Prices, Page 165

Plate producers for the most part are booked for practically all they can produce during the remainder of this year and have not opened books for 1947. Carryover into next year may be as much as two months' production. Many construction projects are being held back by lack of material. Fairly normal plate production is expected to be attained before July 1, which will relieve the situation to some extent, though depleted inventories can not be filled for some time.

Philadelphia—Plate production in the East is at the highest level since late March and early April. Most producers are about three months behind on current commitments and have little to offer for this year. New orders are light as 1947 books have not been opened.

New York—Plate sellers are falling further behind on schedules, although recently two eastern producers resumed operations after suspension of a week or longer and other producers are increasing output. There is heavy pressure from a variety of consumers, sellers simply being unable to cope with it. Meanwhile, virtually all producers are sold solidly for the remainder of the year and

are therefore turning down considerable tonnage as they have not opened books for 1947. Even as matters stand, they will probably go into next year with a carryover of two months production or more.

Boston—Most plate mills are filled with carbon plate orders through the rest of the year, with indications first quarter carryover in this grade will be substantial. While some flange and firebox plates in small sizes might be worked in during fourth quarter no definite promise is made. Floor plates still are available for July and some mills can ship from stock. Heads and flanged work extends six to seven months with shearing and blanking choke points. Demand for small tanks is active and the major problem with fabricators is co-ordinating inventories with plates.

Pittsburgh — Many construction programs, such as railroad cars and locomotives, miscellaneous tank and ship repair and barge construction, have been retarded by plate shortage. Fabricated structural and plate shops report heaviest backlogs and potential business in many years, but little headway has been made in recent months. Leading plate producers expect to attain normal production this week, but it is expected to take at least a month before fabricators' inventories will be adequately balanced to sustain full scale operations.

Seattle—Plates are in good demand but shops are unable to bid on large projects because of shortage of material. Fabricators are in receipt of inquiry for a large volume of small jobs, tanks of all kinds being sought. United States Engineer, Seattle, has called bids for June 14 for 33 fuel storage tanks 38 x 55 feet for the ordnance depot at Fort Lewis, Wash.

Wire . . .

Wire Prices, Page 165

Boston — Mill schedules are being drastically revised, aligned to critical shortage of rods. Consumers are getting only a fraction of tonnage earlier estimated as required. Starting with rods, nonintegrated wire drawers are hardest hit. Unbalance in production centers in prices and there is shortage of low margin items, low-carbon basis galvanized and upholstery spring wire, common wire and nails. Until prices are adjusted to permit profit on goods still under price control all evidence is that these shortages will continue. Wire mills are rejecting substantial volume and in revising schedules are asking some cancellation of orders which have slight chance of being processed soon.

Pittsburgh — To stimulate production of nails and bale ties OPA has advanced prices on these items \$10 and \$4 a ton, respectively, under amendment No. 17 to RPS 6, dated June 11. Nail requirements for 1946 are estimated at 795,000 tons and in 1947 at 825,000 tons. Bale tie requirements this year will approximate 110,000 tons, against indicated output of 80,000 tons.

Tubular Goods . . .

Tubular Goods Prices, Page 165

New York — Most merchant pipe producers estimate that they have lost about a month's production as a result of the recent soft coal strike, and accordingly are now shipping tonnage which would

Production Screwdrivers

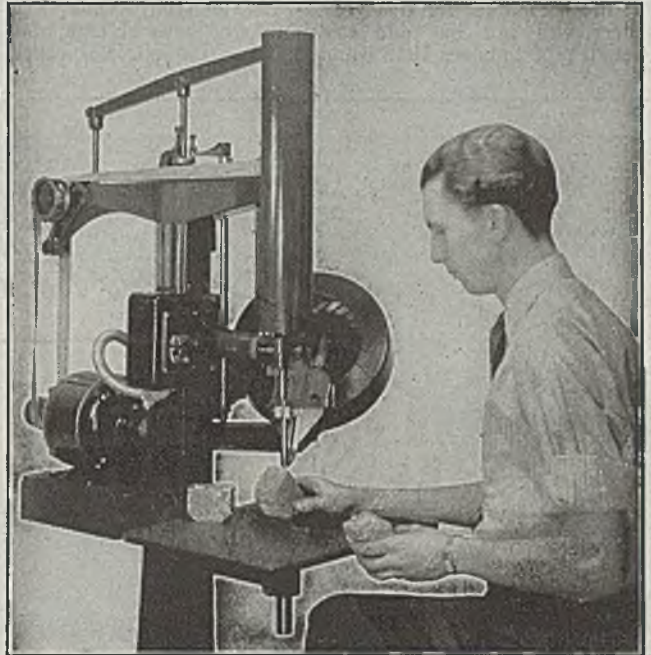
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3/16 to 1 1/2
Inches**

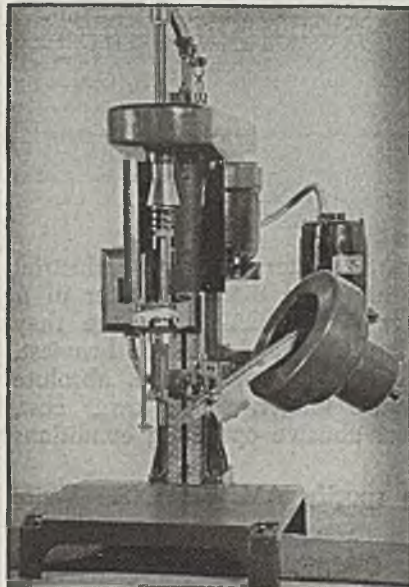
**All Screws
Driven to
a Uniform
Tension**

**No Marring
of Heads**



MODEL B

MODEL A



**Model A Is Designed
to Handle Small Screws
in Sizes
From No. 2 to No. 6
In Lengths
From 3/16" to 3/4"**

**Driving Time
One Second Per Screw**

**Send Sample Assemblies
for Production Estimates
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Detroit Power Screwdriver Co.

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have been moved in May. Most mills are getting back into production fairly rapidly, although at least one large producer estimates that his operations will not be restored to normal much before July 1.

The situation in mechanical and boiler tubing is perhaps relatively less tight than in merchant pipe, due to the sharp falling off in shipbuilding and to inability of engine and equipment builders to maintain production because of the shortage of various materials.

Cleveland—Demand for butt-weld and lap-weld pipe and oil country goods continues heavy with all leading sellers out of the market for this year. Many sellers will not be able to produce enough pipe to cover 1946 commitments.

Some space is still open late in fourth quarter, however, for cold-drawn pressure tubing. Alloy steel tubing is also in fairly good supply with some hot-rolled available in September and some cold-drawn in October.

Seattle — Cast iron pipe projects are developing although buyers know they cannot expect deliveries for months. Strategy is to order now to obtain high position on producers' books. Portland, Ore., has awarded 685 tons of cast iron pipe to Pacific States Cast Iron Pipe Co., Provo, Utah, with a tonnage of steel pipe to Oregon Culvert & Pipe Co., Portland, Ore., at \$76,063. Everett, Wash., has opened bids for 1360 tons of cast iron pipe and Bellingham, Wash., has called bids for June 20 for

335 tons of 4 and 6-inch bell and spigot.

Boston — Waiting for skelp, some pipe mills are still down and several may not be in production until next month, extending deliveries to three months. Butt-weld in smaller sizes is notably scarce. Mills are making few direct shipments of this type of pipe, concentrating on distributor needs on a restricted quota basis. Deliveries of pipe this month will be low, with warehouse stocks disappearing.

Tin Plate . . .

Tin Plate Prices, Page 165

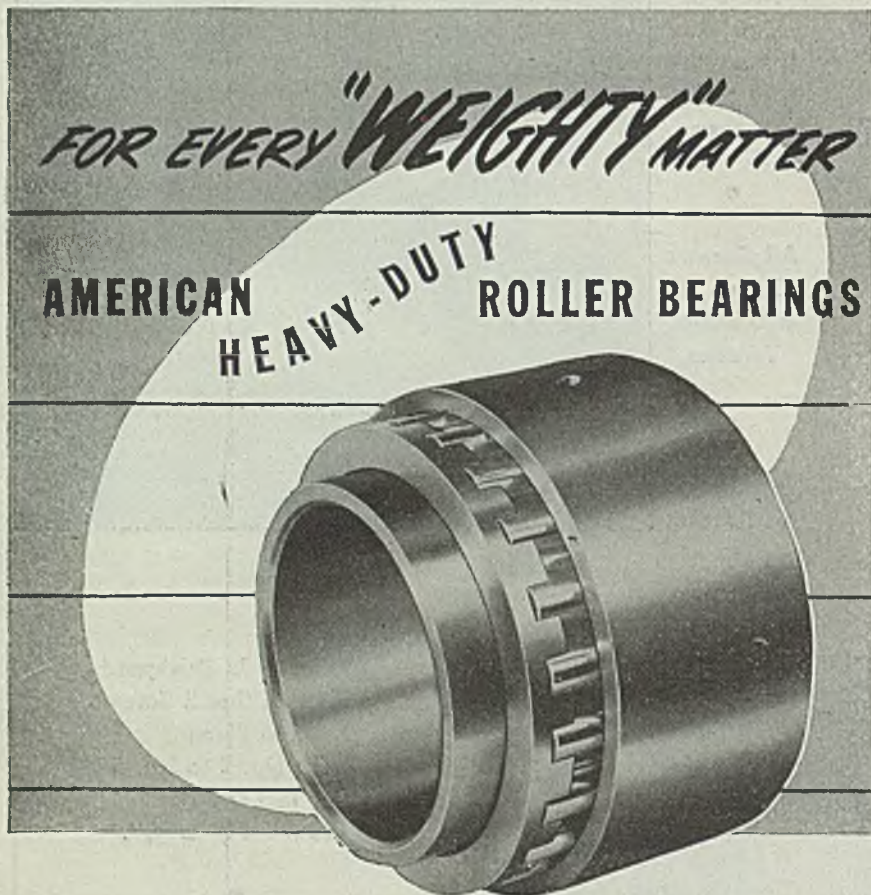
Pittsburgh — Export load directive for third quarter is being held up by CPA pending a check on extent of tin plate production losses incurred during the coal and steel strikes. Early estimates indicate domestic food pack program will absorb nearly all available supply. Producers are setting up July schedules on assumption entire output will be supplied to domestic consumers, as normal deadline for establishing July quota was May 15. The June 15 deadline similarly is expected to be passed up. Fortunately tin plate production was not adversely affected as in other steel products during the coal strike. However, there is some concern that supply will be inadequate to meet essential domestic requirements. Sellers are booked solid through this year and state potential needs will sustain capacity production through most of 1947.

Structural Shapes . . .

Structural Shape Prices, Page 165

Pittsburgh — Structural mills are expected to reach normal production this week. Fabricators report heaviest backlogs and potential business in many years. U. S. Steel Corp. announced plans last week to erect a new plant for the Birmingham operations of Virginia Bridge Co., which will enable the company to handle steel fabrication for all types of construction projects and increase capacity about one-third. As an initial step toward reopening the McKeesport Works at Port Vue, Pa., Jones & Laughlin Steel Corp. will spend \$75,200 on alterations to the steel mill. Before the plant is put back into operation a much larger sum will be spent on improvements. This plant produced a large volume of shells during the war and has been idle since. Another large project, recently approved by CPA, is the construction of a \$115,000 operating headquarters building for the West Penn Power Co., Arnold, Pa.

Boston — On most sizes of plain shapes deliveries extend into December and beyond, with shipments on fabricated material for medium tonnage projects ranging to February. However, on projects from 100 to 300 tons, by co-operating closely with mills for spot rollings and openings, fabricated work can be assembled in three months, provided design changes are held to a minimum and standard sizes are specified. Most New England shops handling these tonnages can hope for completion of structural frames by late fall under these conditions. Demand for plain material in smaller sizes is heavy, including that from warehouses. Small bridges account for about 500 tons.



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Since restrictions have been further tightened on nonhousing projects the Boston office of CPA has issued 84 authorizations and denied 24 applications, including a foundry authorization to Draper Corp., Hopedale, Mass. Industrial construction therefore has not been greatly retarded. The overall backlog of structural fabrication since the first of the year, booked for fabrication during the next four months, has increased about 300,000 tons, to nearly 750,000 tons, according to estimates.

Philadelphia — Shape mills are filled for the year in both standard and special sections. A carryover of at least two months is expected by most producers. District office of CPA from May 31 to June 6, inclusive, approved 99 projects, valued at \$878,311, and denied 129, valued at \$5,083,610.

Pig Iron . . .

Pig Iron Prices, Page 167

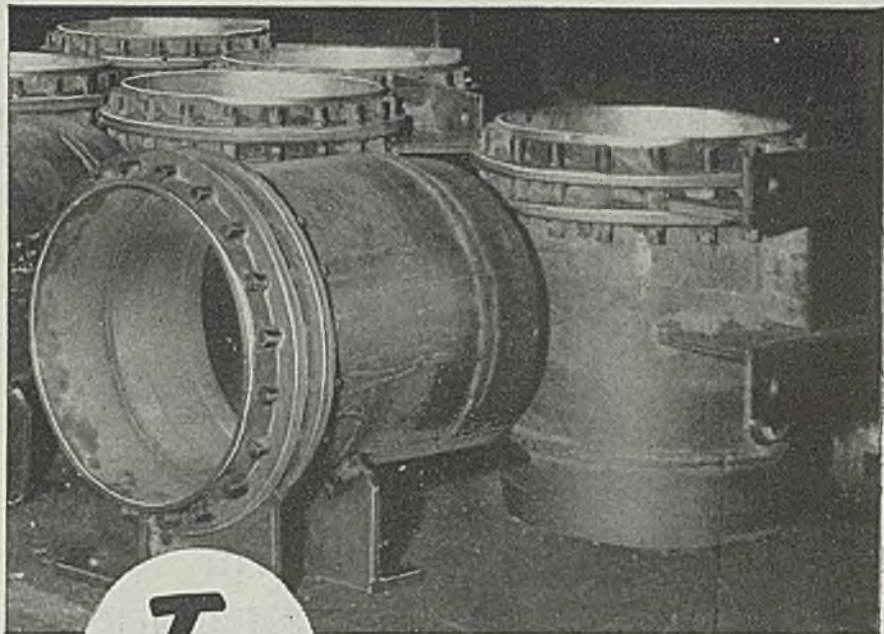
With blast furnaces resuming production as fuel supplies increase, the situation is easing somewhat, though iron still is far below needs and the shortage is expected to continue into next year. Melters practically depleted inventories during the coal strike and furnace shipments are not sufficient to allow any replacement, in fact, not supporting the desired rate of castings production.

New York — Pig iron melt is increasing, as blast furnaces recover from the soft coal strike. It is doubtful if consumption in this district will reach the April level, but it should surpass the mark for May. District foundries believe that it will be about another month before operations approach normal, however; and some believe it will be fall before a new peak for this year will be established. Hot weather and vacation season are expected to serve as a deterrent during the summer, along with shortage of pig iron and scrap.

Concern over the immediate coke situation is being voiced because of the possibility of a maritime strike. Tidewater ovens, it is declared, would be forced to curtail sharply within a week should there be a water tieup.

The effects of any such disruption on pig iron shipments abroad would be practically nil, at least as far as the East Coast is concerned, for there has been no movement of pig iron from eastern ports in considerable time, because of refusal by Washington to issue licenses in view of the present scarcity in this country, and no shipments have been contemplated, for the same reason.

Boston — As expected, pig iron shortage is becoming more critical, due to delay in blast furnace resumption. With inventories depleted most consumers are pressing for tonnage at a time when several furnaces normally supplying this area are still down or on reduced blast. Most consumers would increase melt, including several General Electric and Westinghouse plants, if iron were available, and the same is true of the automobile industry and its suppliers. It now appears the iron situation would have been still more serious but for the strikes in those industries earlier this year. Iron producers have delayed opening books for third quarter because of the large carryover from second and tonnage during that period will be ra-



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tioned, probably through the remainder of the year at least. More foundries have reduced melting operations and more will be forced to take similar action before the supply approximates normal.

Chicago—Pig iron situation is described as being tighter than at any time during the war, the cumulative result of the steel and coal strikes. Foundries seeking to get higher production are pressing for larger tonnages and quicker deliveries, both of which are impossible. Indications were that about 32 of the district's 41 blast furnaces would be in production by last weekend, compared with 26 the previous week and 34 when the coal strike started.

Cincinnati — Pig iron shipments into

this district lag in both northern and southern grades, although furnace interests expect improvement soon. Several major foundries are shut down and others will have a vacation period, including July 4, in hope that after that supply will be better. Although third quarter books have not been opened it is indicated that policies will call for cancellation of second quarter tonnage not shipped, or reduction of third quarter tonnage by that amount.

St. Louis — Pig iron supply is improving slightly, due to steel mill idleness or curtailments, allowing iron to be applied to shortage elsewhere. Gradual replenishment of fuel reserves is easing the situation. Melter's depending on eastern sources continue extremely

short, some operating from day to day. Pig iron production locally is at capacity.

Buffalo — Pig iron production increased 6½ points to 62 per cent of capacity last week but shortage of fuel prevented further advance. Merchant iron sellers are unable to meet foundry demands. Pressure for delivery was lessened somewhat by the fact coke shortage limited foundry operations. Foundries have heavy order backlogs but shipments are far behind schedule.

Birmingham — Pig iron continues short and in heavy demand. Foundries suffering for supplies see no immediate relief. Sloss-Sheffield Steel & Iron Co. still has one furnace on ferromanganese. Coal supply has picked up to practically normal after the strike.

Philadelphia—The smaller stack at Swedeland, Pa., went into blast last week on foundry iron. It is expected this stack will continue on foundry iron through this month and then switch to basic. There is considerable pressure for both grades with little likelihood of betterment for several weeks. Indications are that directives will be issued to relieve pipe foundries, especially those making soil pipe, needed for housing.

Pittsburgh — Strike of 250 employees of the Monongahela Connecting Railroad forced complete shutdown of five blast furnaces at the Jones & Laughlin Steel Corp. Pittsburgh Works, but otherwise a steady upturn in pig iron production was made here last week. By the close of the week 39 out of 54 units were active. Plans are under way to bring some high cost blast furnaces into production. Foundry operations here are gradually showing improvement, now that the merchant blast furnace interest has resumed normal production.

Rails, Cars . . .

Track Material Prices, Page 165

New York — Domestic freight car orders in May involved 2975 units, against 3405 in April, and brought the total for the first five months to 8895, against 14,096 in the corresponding period last year.

Awards so far this month have been spotty, and while considerable work is under contemplation there is some question as to whether June business will be sustained at even the May rate. Shortage of materials, steel, lumber and castings, has caused car builders to fall well behind on commitments and railroads to hesitate in placing new business in anything like the volume that they might otherwise award.

Chesapeake & Ohio has placed forty 2-8-4 high-speed heavy-duty freight locomotives, 30 being awarded to the Schenectady, N. Y., shops of American Locomotive Co. and 10 to Lima Locomotive Works, Lima, O.

Union Pacific has closed on a 6000-horsepower diesel-electric locomotive to Fairbanks Morse & Co., Chicago.

Nonferrous Metals . . .

Nonferrous Prices, Page 169

New York — Shortages of copper and copper products are becoming critical and production is suffering in most industries for lack of components fabricated from that metal. Electric industry will be further restricted before copper

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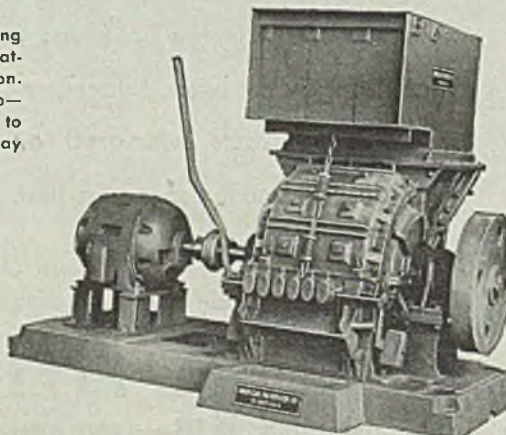
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supply approximates normal, this industry taking more than half primary output. Wire and cable mills are drastically affected and motors and transformers, already extended well into next year, are losing additional ground. Wire and cable production is curtailed 25 to 50 per cent from lack of copper and deliveries are quoted dependent on copper supply.

Government stockpile of about 400,000 tons will be drawn on substantially for primary requirements before domestic production gets under way in volume, but this reserve includes only about 50 per cent of electrolytic copper. Of this tonnage only an estimated 100,000 tons are available for wire bars and forms. Only 10,000 tons of bars are available this month, with requirements about 55,000 tons. Currently production of copper wire rods is about 20 per cent. As recently as April 31,000 tons of bars were available to wire mills and the sharp decline since will have severe effect on housing and many postwar programs. To refill pipelines and re-establish uninterrupted flow of materials, work in process and finished products from two to six months will be required after settlement of mine and refinery stoppages.

Alloy Steel . . .

Philadelphia — One large eastern producer of alloy steels has increased base prices plus extras by 8.2 per cent, retroactive to Feb. 15, on hot-rolled and cold-finished alloy steel bars and hot-rolled steel alloy bar shapes, billets, blooms and slabs. A similar increase also has been announced on hot-rolled and special steel sold by the alloy steel division, and on one special type of alloy bars, including rounds, squares and flats, prices have been increased 25 cents per 100 pounds, subject to carbon steel extras, except for chemistry.

Other alloy steel producers plan similar action, thus marking the end of the confusion existing with respect to pricing of most alloy steel since general increases were announced last winter. Some producers had advanced prices by 8.2 per cent, while others had taken no action except to attach a rider to invoices, providing for supplementary billing in case of a change.

Electrolytic Chromium Prices Reduced Sharply

Electrolytic chromium prices were reduced last week by Electro Metallurgical Sales Corp., a unit of Union Carbide & Carbon Corp. The price of the 3/4-inch size is now \$2 a pound, compared with \$4 a pound prior to Jan. 1, 1945, and \$2.25 a pound since then. Prices for the ground sizes were also substantially reduced to the following levels: 100 mesh size, \$2.50; 200 mesh, \$3; 325 mesh \$3.50. These prices are for the eastern zone. Corresponding prices are also effective for the central and western zones.

Scrap . . .

Scrap Prices, Page 168

(Concluded from Page 78)

in February to 10 or 12 at present. May average was 14½ cars. Scrap dealers attribute the shortage to two factors:

1—Inadequacy of OPA prices as an incentive to gather supplies from oil fields, farms and ranches, etc.; 2—emergency use of scrap parts by fabricators and maintenance and repair shops to keep machinery and cars going. Some reports indicate fairly good visible supplies in some yards, indicating possible hope of better prices from OPA.

Buffalo—With water receipts far short of a year ago and production material at a low ebb, outlook for scrap consumers is poor. Mills have been able to avoid immediate threats of ingot output cuts only because approximately 100,000 tons of scrap was not used during recent labor tieups. Stockpiles need replenishing, but mills have been unable to make much headway along this line as expecta-

tions for a seasonable pickup in supplies are not being fulfilled. Scrap arriving from the upper lakes and the Seaboard via the canal has been disappointing. Word passing through the trade is that no price relief will be granted to spur collections in steel producing areas.

San Francisco — Scrap shortage is worsening steadily, although the supply situation is not yet desperate. Virtually the only material coming on the market now is industrial scrap and supplies of that are not sufficient to meet needs. Scarcely any auto scrap is available, and movement of battlefield scrap from the Pacific is negligible. Approximately 40,000 to 50,000 tons of scrap are being prepared in Honolulu, but up to now a shortage of shipping space has prevented



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any movement of this material. Once bottoms are available, and if the scarcity continues, large quantities are expected to begin moving to San Francisco and Los Angeles.

As a result of the heavier demand, prices for open hearth grades of scrap have risen to ceiling levels.

Los Angeles — Scrap is exceedingly short. Dealers are getting ceiling of \$16.58 for all prepared No. 1 heavy melting they can find. Shipyard scrap, which kept area supplied long after rest of nation ran short, is now about exhausted. Imports of unprepared scrap from Australia are docking here in increasing quantities. All mills in area are operating on standing buying order system, paying \$7 to \$10 for unprepared scrap when obtainable.

Birmingham—Scrap, although somewhat easier this week, is seriously short supply. Steel mills are taking what tonnage they can get and providing springboards in most instances, but all grades are alarmingly scarce, especially cast. Industrial and railroad supplies have been short and dealers are not making special efforts to get scrap because of high preparation costs and what they term inadequate OPA ceilings.

Seattle—Scrap is coming to the mills in satisfactory volume, shipments having increased since the ceiling price, \$14.12 gross ton, fob mill, became effective. Bethlehem Pacific Coast has purchased 4000 tons from the Todd Seattle yards, product of scrapping a new navy vessel. Other major purchases have been made at Tacoma and Portland yards through dealers. Under present conditions the local market for scrap is more favorable than shipping to Eastern consumers. Shipyard scrap supplies are now approaching the end.

Cincinnati—Scrap shipments are at the lowest levels in years, although demand is pressing on brokers and dealers. Normal requirements were boosted during the coal strike when melters looked to scrap to continue operations. Reserves in yards were shipped to mills. Now production scrap has failed, yards have been stripped of tonnage, and terminal scrap dwindled in importance.

Market interests hold little tonnage is being stocked in anticipation of higher prices.

St. Louis—Scrap demand is heavy, but is based principally upon melters' worries for the future. Shortage is not acute except in cast grades. Last week nine foundries were shut down by strike, which is expected to ease pressure on cast grades. One steel mill had half of its furnaces off 10 days for repairs, during which it accumulated 90 days of scrap reserve. Scrap shipments to this area are slow, rated by some brokers at 50 per cent under May. This is attributed to rumors of an impending ceiling price increase, which rumors also tend to increase mill demand.

Boston—Unabated demand for scrap, well in excess of visible supply, finds a below-normal volume emanating from industrial, automobile and railroad sources and a slacking off in low phos from ship yards. Steelmaking and cast grades are both short and flow of unprepared reaching yards is not sufficient to keep presses operating steadily. Prices are strong at ceilings, with the exception of triple alloys. Relatively high production of alloy material during the war is still showing up in inspections.

Sees Europe Large Buyer of American Tools

Cincinnati—Western European countries have demonstrated remarkable recuperation and if economic conditions permit will provide export outlets for many types of American products, particularly machine tools and equipment, is the conclusion of William L. Dolle, president and general manager of Lodge & Shipley Machine Tool Co. He has just returned from an 8000-mile trip that included Great Britain, Belgium, the Netherlands, France and Switzerland and summarizes his observations by the statement that Western European countries have overcome wartime stress and will become good customers for American goods.

Cincinnati machine tool manufacturers were little affected by the major strikes, though normal supplies, including electrical equipment is a principal handicap. Foreign business continues up to 60 per cent of total bookings. Deliveries average six months.

Milwaukee—European countries will purchase substantial quantities of machine tools and other production equipment in the next 3 or 4 years with Russia and France probably the biggest buyers, Joseph Trecker, executive vice president, Kearney & Trecker Corp., told business paper editors and publishers at Wisconsin Club, Milwaukee, June 12. Trecker, who just returned from Europe, said: "The most remarkable and important thing is that no foreign country has as yet sought to buy our surplus machine tools. Each country has wanted the newest and the best machinery which will produce goods by use of the most modern methods." Foreign industrialists are thoroughly alive to the importance of increasing production of the individual worker, he said. While in this country there is a common impression that the job of making America is about over and that the only remaining problem is to sit down and divide up as little work as possible among the largest number of people. "I am convinced," he said, "that until the workers of this country and the public at large become sold on the fact that jobs depend upon productivity alone, adequate headway in creating and maintaining the degree of employment all of us want for this country, will be impossible."

St. Louis—Demand for machine tools and other industrial machinery is strong and order backlogs probably will not be substantially reduced for more than a year. Despite an undermining effect on standard tools, disposal of government surplus equipment has had only a moderately bad effect, not preventing manufacturers from being deluged with orders for new equipment. Tools obtainable in 30 to 60 days in peacetime now require up to 14 months. Electric motors are the principal bottleneck.

Cleveland — Full impact of the major strikes is being exerted on the machine tool industry this month. Orders dropped about 30 per cent in May and shipments declined 10 to 15 per cent, with further decline expected in June. This is attributed to shortage of components, electric motors especially, such deliveries being delayed as much as 55 weeks. Steel plates are scarce. Foundries are catching up to some de-

gree but still lag considerably. Export buying has declined to 20 per cent of total business. There is dissatisfaction in the manner of government surplus tool disposal, though it has not interfered with new tools as much as had been expected. The trade believes these tools should be released as rapidly as possible and put to work.

Pittsburgh — There is little prospect of machine tool builders increasing output until present shortage of steel and components is remedied. No significant increase in steel supply is expected for

several weeks and output of small electric motors is expected to be curtailed for a long period. Shortages are expected for the remainder of the year, order backlogs on small motors being extended 65 to 85 weeks. Latest reported offering of surplus tools and equipment, valued at \$2 million, at a government plant at Beaver, Pa., formerly operated by Curtiss-Wright Corp., will be on sale June 10 to July 12. This lot includes 2000-ton hydraulic presses and lathes, grinding and milling machines. Heavy demand for new and used machine tools is indicated for many months, as modernization of equipment is essential to combat rising labor and raw material costs.



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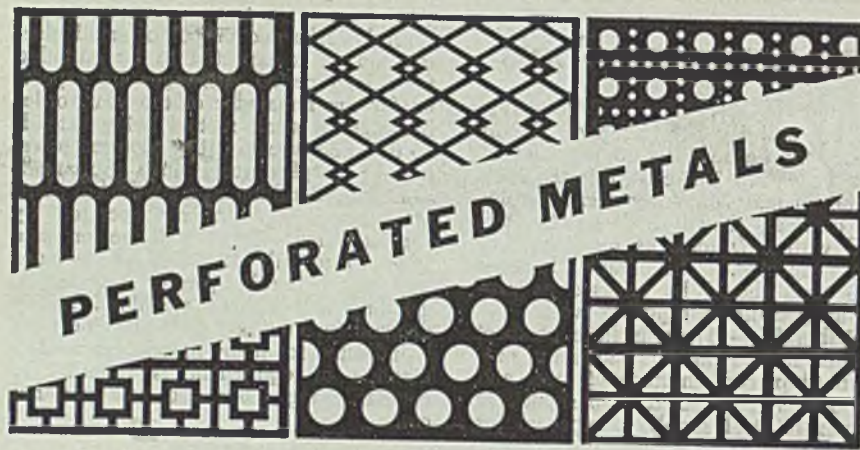
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STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

- 2500 tons, power plant for Consolidated Gas & Electric Co., Baltimore, to Belmont Iron Works, Philadelphia.
- 2350 tons, bridge, Lamberts Point, Va., for Norfolk & Western railroad, to Virginia Bridge Co., Roanoke, Va.
- 1660 tons, No. 2 toll office building, Chicago, for Illinois Bell Telephone Co., to American Bridge Co., Pittsburgh; bids March 11.
- 785 tons, shapes for 2400 houses, for National Homes Corp., Lafayette, Ind., to Bethlehem Steel Co., Bethlehem, Pa.
- 500 tons or more, addition to Securities Bldg., Seattle, to Isaacson Iron Works, Seattle.
- 275 tons, administration building, Whiting, Ind., for Sinclair Refining Co., to Joseph T. Ryerson & Son Inc., Chicago; Austin Co., Chicago, contractor.
- 250 tons, state bridge at Houlton, Me., to American Bridge Co., Pittsburgh, through A. P. Wyman Co., Augusta, Me.
- 170 tons, Green Ridge St. bridge, Lackawanna county, Pennsylvania, to Phoenix Bridge Co., Phoenixville, Pa.
- 160 tons, lighting towers, Fenway Park, Boston, to American Bridge Co., Pittsburgh.
- 150 tons, du Pont plant addition, Cameys Point, N. J., to Morris Wheeler & Co., Philadelphia.
- 140 tons, service station extension in Connecticut, for Connecticut Light & Power Co., to Berlin Construction Co., Berlin, Conn., through United Engineers & Constructors Inc., Philadelphia.
- 138 tons, highway bridge, Spec. 1294 Oakhurst, Calif., for Bureau of Reclamation, to Consolidated Steel Corp., Los Angeles.
- Unstated tonnage, coaster gates, Bureau of Reclamation, Denver, to American Bridge Co., Denver, \$167,815.20, spec. 1223.

STRUCTURAL STEEL PENDING

- 3700 tons, bridge, Milan, Ill., for state; Bethlehem Steel Co., Bethlehem, Pa., low; bids June 7.
- 2000 tons, two state bridges, Allegheny county, Pennsylvania.
- 1500 tons, various buildings, Plaster, Calif., for United States Gypsum Co.
- 1000 tons, mill building, Bartow, Fla., for International Minerals & Chemical Corp.
- 300 tons, coal processing plant, Herrin, Ill., for Freeman Coal Mining Corp.
- 285 tons, hangar, Chicago, for Chicago & Southern Air Lines Inc.
- 280 tons, administration building for Boston Housing Authority, Boston.
- 130 tons, centrifuge building, United States Naval Air Station, Philadelphia; bids June 11.
- 128 tons, building, Chicago, for Sam Cassel Co.; bids June 3.
- 110 tons, state bridge, Lackawanna county, Pennsylvania, bids June 14.
- Unstated, transfer bridge, navy magazine depot, Indian Island, Washington; general contract to M. P. Butler, Seattle, \$117,602.
- Unstated, 182-foot steel and concrete highway span, Tongue Point, Oreg.; bids to Navy, Seattle, June 17.
- Unstated, two steel bridges, Oregon highways; general contract to A. A. Doveri, Klamath Falls, \$49,960.
- Unstated tonnage, structural steel cofferdam, Bureau of Reclamation, Central Valley project, spec. 1279, Consolidated Steel Co., Los Angeles, low, \$165,300 fob Los Angeles.

REINFORCING BARS . . .

REINFORCING BARS PLACED

- 2500 tons, warehouses for Publicker Alcohol Co., Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.
- 685 tons, milling plant, Huron, O., for Eastern Mill Co-operative Association, divided between Carnegie-Illinois Steel Corp., Chicago; Joseph T. Ryerson & Son Inc., Chicago; and

- Concrete Steel Co., Chicago; James Stewart Corp., Chicago, contractor.
- 270 tons, highway work, Mills county, Iowa, for state, to Ceco Steel Products Corp., Omaha; Western Contracting Co., Sioux City, Iowa, contractor; bids April 30.
- 220 tons, plant, Sugar Creek, Mo., for Standard Oil Co., to Ceco Steel Products Corp., Cicero, Ill.
- 200 tons, highway work, Lyon county, Iowa, for state, to Ceco Steel Products Corp., Omaha; Western Contracting Co., Sioux City, Iowa; bids April 2.
- 100 tons, sanitary sewage system, Whiting, Ind., for Standard Oil Co. of Indiana, to Ceco Steel Products Corp., Cicero, Ill.

REINFORCING BARS PENDING

- 600 tons, Jacob Riis Houses; bids June 18 by New York Housing Authority.
- 220 tons, addition, Chicago, for Dole Valve Co.; bids June 17.
- 195 tons, three bridges, for Cook county, Ill.; bids June 11.
- 180 tons, steel joist, manufacturing building, Lincoln, Ill., for Lehn & Fink Products Corp.; B-W Construction Co., Chicago, contractor.
- 100 tons, wire mesh, paving of 76th street, Chicago, for city; bids June 7.
- Unstated, building, railway spring division, Chicago Heights, Ill., for American Locomotive Co.; bids June 7.
- Unstated, cafeteria and auditorium, Fenwick high school, Oak Park, Ill.; bids June 22.
- Unstated, Alaska army headquarters, Fort Richardson; Morrison-Knudsen Co., Seattle, general contractor, \$1,032,000.
- Unstated, civil engineering building, University of Washington, Seattle, Strand & Sons, Seattle, general contractors, \$894,700.

PLATES . . .

PLATES PLACED

- Unstated, Oak Lodge district project, Portland, Oreg., to Oregon Culvert & Pipe Co., \$76,063.

PLATES PENDING

- Unstated, 33 fuel storage tanks, ordnance depot, Fort Lewis, Wash.; bids to U. S. engineer, Seattle, June 14.

PIPE . . .

CAST IRON PIPE PLACED

- 685 tons, Oak Lodge district, Portland, Oreg., to Pacific States Pipe Co., Provo, Utah.

CAST IRON PIPE PENDING

- 1360 tons, Everett, Wash., bids in June 10.
- 420 tons, 10 and 12-inch, naval magazine, Port Chicago, Calif.; bids June 24, Mare Island naval shipyard.
- 335 tons, 30,000 ft. 6 and 4-inch, Bellingham, Wash.; bids June 20.
- 100 tons, six-inch, also 12,000 linear feet, 10-inch steel water line, missile test unit, White Sands Proving Grounds, N. Mex.; bids to U. S. engineer, Albuquerque, N. Mex.
- Unstated, north end district improvement, Tacoma, Wash.; bids soon; \$191,838 available.
- Unstated, system expansion, Kelso, Wash.; bids June 16.

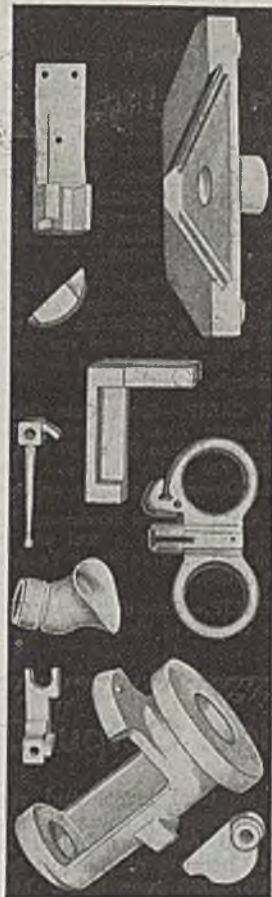
RAILS, CARS . . .

RAILROAD CARS PENDING

- Illinois Central, 1000 fifty-ton box cars and 400 fifty-ton hoppers.
- Missouri Pacific, 250 forty-ton refrigerators.
- Reading Co., 8 combination passenger-motor cars.

LOCOMOTIVES PLACED

- Chesapeake & Ohio, 40 heavy-duty 2-8-4 freight locomotives; 30 to American Locomotive Co., Schenectady, N. Y., shops and 10 to Lima Locomotive Works, Lima, O.
- Union Pacific, one 6000-horsepower diesel-electric locomotive to Fairbanks Morse Co., Chicago.



An OPEN LETTER on MODERN PRECISION CASTING

If you are now producing small metal parts by conventional methods of casting, forging or machining, you may be able to realize substantial savings in production costs by using precision casting methods.

Developed to meet wartime production demands, this new process may be applicable to your products particularly if machining costs are high or runs are short with high costs.

Precision casting is being used today to produce a wide range of parts in ferrous and non ferrous metals including high temperature alloys and varying in size from a fraction of an ounce to several pounds.

Compared to other industrial equipment, the cost of a complete precision casting plant remains surprisingly low.

As a dealer in precision casting equipment and supplies we offer detailed information to set up and operate a precision casting plant for your production.

Descriptive circulars of equipment and price lists of supplies furnished on request.

ALEXANDER SAUNDERS & CO.

Successor to J. Goebel & Co.—Est. 1865
PRECISION CASTING EQUIPMENT AND SUPPLIES
 95 Bedford St. New York City 14

Tops on Speed in Handling Coil Stock

COIL stock, fed by LITTELL Automatic Centering Reels, insures efficient, fast, accurate, economical production. It permits continuous feeding, prevents waste of material and provides automatic roll feeding direct from coils.

LITTELL Reels automatically center coils. Ball bearing, they are easy running and insure free-moving coils for accurate feeding. Adjustable stock support holds up loose loops of coils and permits very light brake adjustment.

Plain and motor-driven types. Capacities, 300 to 6,000 lbs. Coil Cradles can be supplied for coils up to 20,000 lbs.

LITTELL also makes Roll Feeds, Dial Feeds, Feeding and Straightening Machines, Scrap Winders, Air Blast Valves, Pres-Vac Safety Feeders and Mechanical Pickers.

REQUEST BULLETINS

F.J. LITTELL MACHINE CO.
 4165 RAVENSWOOD AVE., CHICAGO 13, ILL.

CONSTRUCTION AND ENTERPRISE

CALIFORNIA

LOS ANGELES—Western Iron & Metal Co., 2500 Santa Fe Ave., is building a steel frame warehouse 51 x 262 feet at 2417 East 25th St., to cost about \$24,000.

LOS ANGELES—Pacific Brake Co. has let contract to Buttress & McClellan, 1013 East Eighth St., Los Angeles, for a plant building at Ninth Ave. and Exposition Blvd., 100 x 200 feet, to cost about \$75,000.

MAYWOOD, CALIF.—O'Keefe & Merritt, manufacturers of stoves and ranges, are having plans drawn for a 50,000-ton per year capacity sheet mill on a 17-acre site, structure to be 85 x 780 feet. Loftus Engineering Co., Pittsburgh, is engineer.

SOUTH GATE, CALIF.—South Gate Gasket Co., 8440 Victoria Ave., is having plans made for a plant addition 95 x 157 feet, to cost about \$25,000. Roy A. Hatch, 515 LaReina Ave., Downey, Calif., is architect.

SOUTH GATE, CALIF.—Fred Sherbourne, 700 East 85th St., is building a tool and die shop 40 x 40 feet at 8714 Santa Fe Ave., to cost about \$6000.

VAN NUYS, CALIF.—General Motors Corp. is building a carloading plant at 7800 Van

Nuys Blvd., 50 x 385 feet, to cost about \$60,000.

VENICE, CALIF.—Western Air Lines Inc., 6331 Hollywood Blvd., Hollywood, Calif., is building a hangar at 6020 West Century Blvd., Venice, 250 x 510 feet, to cost about \$1,400,000. Austin Co. is contractor.

CONNECTICUT

MONTVILLE, CONN.—Connecticut Light & Power Co., Waterbury, Conn., has let contract to United Engineers & Constructors Inc., 1401 Arch St., Philadelphia; for reconstructing power plant at cost of \$4,300,000, including equipment.

ILLINOIS

ROCK ISLAND, ILL.—J. I. Case Co., Sixth St., has let contract to Priester Construction Co., Davenport Bank Bldg., Davenport, Iowa, for a one-story plant addition 200 x 260 feet, to cost about \$1,500,000, including equipment. (Noted June 3.)

MICHIGAN

BERKLEY, MICH.—Hamilton Products Inc., 3642 West First St., has been incorporated with \$20,000 capital to manufacture tools,

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SPECIAL WASHERS
AND
SMALL STAMPINGS

• Twenty-five years of specializing in the production of Special Washers and Small Stampings make it easy for us to solve your problems in this field. More than 10,000 sets of tools are ready to produce the washers and stampings you desire. Our expert Tool and Die Department is also ready to help—if none of the present sets of tools can give you what you want.

Special Washers and Small Stampings are available from steel, brass, copper and other metals. Just send your blueprints or specifications to us.

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MASTER PRODUCTS
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6400 PARK AVE. • CLEVELAND 5, OHIO

May Ingot Output Deeply Cut by Strike

Production of steel ingots and steel for castings during May was approximately 1,787,000 net tons below the total for April, because of the soft coal strike, and 3,376,000 tons below May, 1945, according to the American Iron & Steel Institute. May production totaled 4,073,465 tons, representing an average of 52.2 per cent of capacity. This compares with 5,860,258 tons produced in April, at 77.5 per cent of ca-

capacity. In May, 1945, output was 7,449,667 tons, at an average of 91.8 per cent of capacity.

During the ten-month period from August, 1945, when the war ended, through May of this year, the industry produced 51,276,314 tons of steel ingots and steel for castings, compared with production of 73,312,253 tons during the corresponding period from August, 1944, to May, 1945.

STEEL INGOT PRODUCTION STATISTICS

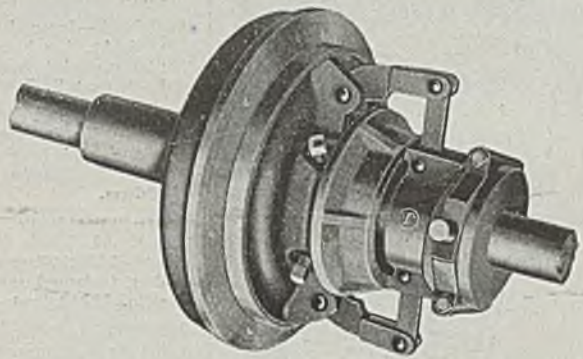
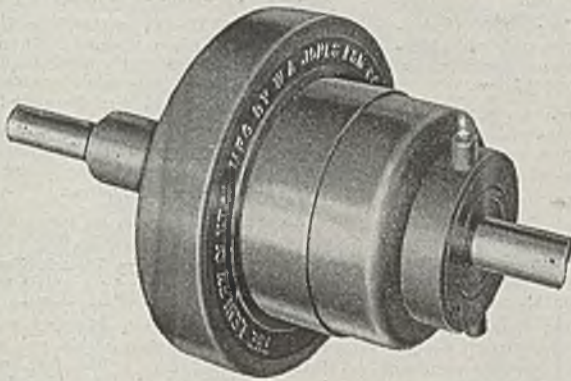
Based on reports by companies which in 1944 made 97.9% of the open hearth, 100% of the bessemer and 86.7% of the electric ingot and steel for castings production

	—Open Hearth—		—Estimated Production—		—All Companies—		—Total—		Calculated weekly production all of companies Net tons	Number of weeks in mo.
	Net tons	Per cent of capac.	Net tons	Per cent of capac.	Net tons	Per cent of capac.	Net tons	Per cent of capac.		
1946										
Jan.	3,528,090	51.1	207,512	47.4	136,452	29.2	3,872,054	49.6	874,053	4.43
Feb.	1,300,944	20.9	25,905	6.6	65,668	15.6	1,392,517	19.8	348,129	4.00
Mar.	5,946,698	86.2	363,949	83.1	196,400	42.0	6,507,047	83.3	1,468,859	4.43
1st qtr. ...	10,775,732	53.8	597,366	47.0	398,520	29.4	11,771,618	51.9	915,367	12.86
Apr.	5,333,139	79.8	286,088	67.5	241,031	53.3	5,860,258	77.5	1,366,028	4.29
May	3,708,790	53.7	153,718	35.1	210,957	45.1	4,073,465	52.2	919,518	4.43
1945										
Jan.	6,468,815	90.5	379,062	76.0	358,346	77.3	7,206,223	88.8	1,626,687	4.43
Feb.	5,967,842	92.4	347,227	77.1	339,520	81.1	6,654,589	90.8	1,663,647	4.00
Mar.	6,927,377	96.9	398,351	79.8	382,237	82.4	7,707,965	95.0	1,739,917	4.43
1st qtr. ...	19,364,034	93.3	1,124,640	77.6	1,080,103	80.2	21,568,777	91.6	1,677,199	12.86
Apr.	6,541,097	94.4	372,952	77.2	377,877	81.4	7,291,926	92.8	1,699,750	4.29
May	6,663,577	93.2	402,100	80.6	386,075	83.3	7,451,752	91.8	1,682,111	4.43
June	6,129,266	88.5	379,807	78.6	333,217	74.2	6,842,290	87.1	1,594,939	4.29
2nd qtr. ...	19,333,940	92.1	1,154,859	78.8	1,097,169	80.6	21,585,968	90.6	1,659,183	13.01
1st hlf. ...	38,697,974	92.7	2,279,499	78.2	2,177,272	80.4	43,154,745	91.1	1,668,139	25.87
July	6,318,463	88.6	381,832	76.7	286,713	61.9	6,987,008	86.3	1,580,771	4.42
Aug.	5,171,925	72.3	347,088	69.5	217,363	46.9	5,736,376	70.7	1,294,893	4.43
Sept.	5,435,358	77.8	352,847	73.2	195,156	43.5	5,983,361	76.3	1,397,982	4.28
3rd qtr. ...	16,925,746	79.9	1,081,767	73.1	699,232	50.9	18,706,745	77.8	1,424,733	13.13
9 mos. ...	55,623,720	88.3	3,361,266	76.5	2,876,504	70.4	61,861,490	86.6	1,586,192	39.00
Oct.	5,146,370	72.0	242,122	48.5	209,290	45.1	5,597,782	69.0	1,263,608	4.43
Nov.	5,640,850	81.5	358,664	74.2	201,866	44.9	6,201,380	78.9	1,445,543	4.29
Dec.	5,522,829	77.4	343,266	68.9	192,704	41.7	6,058,799	74.8	1,370,769	4.42
4th qtr. ...	16,310,049	76.9	944,052	63.8	603,860	43.9	17,857,961	74.2	1,359,053	13.14
Last hlf. ...	33,235,795	78.4	2,025,819	68.5	1,303,092	47.4	36,564,706	76.0	1,391,881	26.27
Total ...	71,933,769	85.5	4,305,318	73.3	3,480,364	63.7	79,719,451	83.5	1,528,950	52.14

For 1945 percentages are calculated on weekly capacities of 1,614,338 net tons of open hearth, 112,658 tons of bessemer and 104,640 tons of electric ingots and steel for castings, total 1,831,636 tons; based on annual capacities as of Jan. 1, 1945 as follows: Open hearth 84,171,500 net tons, bessemer 5,874,000 tons, electric 5,455,890 tons.

For 1946 percentages are calculated on weekly capacities of 1,558,041 net tons open hearth, 98,849 net tons bessemer and 105,491 net tons electric ingots and steel for castings, total 1,762,381 net tons; based on annual capacities as of Jan. 1, 1946, as follows: Open hearth 81,236,250 net tons, bessemer 5,154,000 net tons, electric 5,000,290 net tons, total 91,890,540 net tons.

JONES-LEMLEY FRICTION CLUTCHES



JONES-LEMLEY friction clutches are built for a broad range of shaft sizes and ratings in both enclosed and open types for sleeve and coupling work. In addition they are available in a line of Jones-Lemley friction clutch

pulleys. This clutch modification is also used for gears, V-belt sheaves, sprocket wheels, etc. Sizes, ratings, dimensions, prices and other data are contained in Bulletin No. 60. Your request will bring a copy.



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CUT AND MOLDED TOOTH GEARS • Y-BELT SHEAVES • ANTI-FRICTION
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SEAMLESS HIGH PRESSURE GAS CYLINDERS

FOR ALL COMPRESSED
and LIQUEFIED GASES
DIAMETERS UP TO 13"

HOT DRAWN
FROM CARBON MANGANESE
and CHROME MOLY STEELS

Carefully Made
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Other TISCO Products:

MANGANESE STEEL CASTINGS •
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INGS • FROGS • SWITCHES
SPECIAL TRACKWORK
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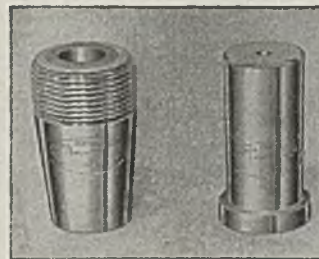
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WHEREVER BLASTING IS DONE!



Wherever there is
blast cleaning there
ought to be a Federal
Blast Nozzle. Made
of cast tungsten-car-
bide (the hardest

metal known to man) the Federal Blast Nozzle con-
centrates the blast, reduces air costs and outwears
any nozzle previously offered for the purpose.

Being cast, the tungsten-carbide is pure—as is not
the case when made by sintering.

The purity of the metal ensures long wear, reduces
air consumption and guarantees concentration of the
blast—all due to the extremely slow wear of the
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Made in several sizes; adapters can be furnished
to fit all makes of blasting equipment.

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CLEANED
and CONDITIONED
METAL SURFACE
Certified
FOR DURABLE
LUSTROUS FINISH

**CHEMICALS
ACP
PROCESSES**

ACP CHEMICALS
PROPERLY CLEAN
and PREPARE
METAL SURFACES for
ORGANIC FINISHES
Prevent paint failures
Minimize rejects
Assure enduring
lustrous finishes

COLD SPRAY-GRANODINE produces a dense smooth zinc phosphate coating that protects steel and paint for a durable, lustrous paint finish.

THERMOIL-GRANODINE creates a heavy coating of iron and manganese phosphate which when oiled retards corrosion and prevents excessive wear on friction surfaces. When painted provides unusual protection.

DURIDINE 210 B (formerly 210 B Decidine) assures proper cleaning and a thin, light and relatively hard phosphate coating so essential to a bright enduring paint finish.

DEOXIDINES—Phosphoric acid metal cleaners. Remove rust and rusters and prepare metal surfaces properly for lasting paint finish.

LITHOFORM—a phosphate coating that bonds paint to galvanized, zinc or cadmium coated surfaces.

American Chemical Paint Co.
AMBLER, PA. PENNA.

gages, jigs and machinery, by Thomas J. Llewellyn, 1122 Columbia Rd., Berkley.

DAVISON, MICH.—Wright & Co., 8326 Davison Rd., has been incorporated with \$25,000 capital to manufacture tools, machines and equipment, by Thomas Wright, same address.

DETROIT—Jaxon Screw Corp., 1800 Springwells St., has been incorporated with \$50,000 capital to manufacture screw products, by Hubert R. Britton, same address.

DETROIT—Chamco Products Inc., 1254 La Brosse St., has been incorporated with \$50,000 capital to manufacture metal weather strips, by Chamberlain Co. of America, same address.

DETROIT—Master Machine & Gear Works Inc., 32 Louck St., has been incorporated with \$150,000 capital to manufacture gears, dies, tools and stampings, by Ben L. Silberstein, 18240 Santa Barbara St.

DETROIT—Nason Co., 7663 Epworth Bldg., has been incorporated with \$10,000 capital to manufacture steam traps, pressure switches and powerhouse equipment, by Allen E. Hawks, 15067 Warwick Rd.

DETROIT—Motor City Gauge & Tool Co., 21813 Gratiot Ave., has been incorporated with \$40,000 capital to manufacture gages, tools, dies, jigs and stampings, by Edwan R. Haldeman, 1976 Van Antwerp Ave., Grosse Pointe, Mich.

DETROIT—Ray-Plastics Co., 21341 West McNichols Rd., has been incorporated with \$50,000 capital to manufacture service molds and tools for plastic products, by Catherine M. Nauth, 120 Pingree St.

DETROIT—C. B. L. Mfg. Co., 14817 Wyoming Ave., has been incorporated with \$50,000 capital to manufacture machine parts, by William Blatt, 17144 Northlawn Ave.

DETROIT—Fractional Motors Inc., 1126 Dime Bldg., has been incorporated with \$25,000 capital to manufacture electric motors and kindred products, by Harry A. Smith, 19111 Saratoga Blvd., Birmingham, Mich.

DETROIT—Frankenstein Mfg. Co., 5455 Oakman Blvd., has been incorporated with \$50,000 capital to manufacture machine tools and operate a machine shop, by Richard T. Frankenstein, 18625 Rosclawn St.

DETROIT—Detroit Alloy Steel Co., 282 Iron St., has been incorporated with \$25,000 capital to conduct a general foundry business, by Detroit Gray Iron Foundry Co., same address.

DETROIT—Kost-Wright Co., 2056 Penobscot Bldg., has been incorporated with \$50,000 capital to manufacture metal stampings, by Harold Kost, 4500 Detroit Ave., Toledo, O.

EAST DETROIT, MICH.—Induction Steel Castings Co. Inc., 18021 East Nine Mile Rd., has been incorporated to manufacture ferrous and nonferrous castings and metal products, by Karl E. Ness, 4200 Bishop St., Detroit.

EAST DETROIT, MICH.—Warren Tool Co. Inc., 21311 Groesbeck Highway, has been incorporated to manufacture tools, dies, jigs and fixtures, by Albert Krause, 8426 St. Cyril St., Detroit.

FERNDALE, MICH.—Victor Tool Co., 2305 Hilton St., has been incorporated with \$75,000 capital to manufacture tools, gages and burnishers, by Milton H. Denker, same address.

GRAND RAPIDS, MICH.—Kent Screw Products Co., 2825 28th St., has been incorporated with \$50,000 capital to manufacture metal products, by Adaline B. Small, 2327 Wilshire Dr. SE., Grand Rapids.

GRAND RAPIDS, MICH.—Lamont Brass Corp., 1340 Front Ave., has been incorporated with \$50,000 capital to manufacture brass products, by Robert M. Dyksterhouse, Lamont, Mich.

HANOVER, MICH.—Hanover Products Co. has been incorporated with 250 shares no par value to manufacture mechanical appli-

ances, by Arthur W. Poole, 231 West South St., Hanover.

HUNTINGTON WOODS, MICH.—Hautau Stamping Co., 26690 Huntington Rd., has been incorporated with \$50,000 capital to manufacture stampings and machinery, by Charles F. Hautau, same address.

JACKSON, MICH.—Beyer Machine Co. Inc., 808 East Michigan Ave., has been incorporated with \$200,000 capital to manufacture tools, dies, jigs and machinery, by Frank W. Beyer, 142 West Prospect St.

LANSING, MICH.—Orr Engines Inc., 425 South Grand Ave., has been incorporated to manufacture internal combustion engines, by Wilfred G. Orr, same address.

MISSOURI

St. LOUIS—Westinghouse Electric Corp., 717 South Twelfth St., has let contract to Grove, Sheppard, Wilson & Krugs, Jefferson Hotel, for a one-story 146 x 351 foot warehouse and one and two-story office and manufacturing building 240 x 336 feet, estimated to cost \$750,000. L. W. Mechling, care owner, is architect.

NEW JERSEY

BURLINGTON, N. J.—Hercules Powder Co., 900 Market St., Wilmington, Del., has let contract to Buck & Donahue, 790 Broad St., Newark, N. J., for a chemical plant to cost about \$1,500,000. (Noted May 13.)

OHIO

CLEVELAND—Amalgamated Steel Co., 7835 Broadway, H. S. Meshorer, president, will build a warehouse addition of 5000 square feet, to cost about \$15,000.

CLEVELAND—National Advisory Committee for Aeronautics, Edward Sharp, manager, Cleveland Airport, is taking bids on four additional burner test cells to be housed in a building 80 x 100 feet.

NILES, O.—General Electric Co., V. C. Fugman, Nela Park, Cleveland, in charge, will spend \$40,000 in plant improvements, half for an addition and half for equipment.

WOOSTER, O.—Buckeye Aluminum Co., Spruce St., manufacturer of aluminum products, will build a plant addition costing \$13,500.

PENNSYLVANIA

AMBRIDGE, PA.—A. M. Byers Co., Clark Bldg., Pittsburgh, has let contract to Fort Pitt Bridge Works, Pittsburgh, for a cold-finishing mill 400 x 412 feet and 50 x 400 feet, estimated to cost about \$800,000.

CORAOPOLIS, PA.—Homestead Valve Mfg. Co. has let contract to Rose & Fisher, 200 East Ohio St., NS Pittsburgh, for a plant building 100 x 400 feet, to cost about \$200,000.

EASTON, PA.—Binney & Smith Co. will let contract soon through J. N. Hettel, architect, 501 Cooper St., Camden, N. J., for an industrial laboratory costing about \$60,000.

PHILADELPHIA—Atlantic Refining Co., 260 Broad St., has let contract to M. W. Kellogg Co., 225 Broadway, New York, for a refinery addition to cost about \$250,000.

SHARON, PA.—Westinghouse Electric Corp., Maloney Bldg., Pittsburgh, has let contract to Paul W. Glenn, 17 South Dock St., for a one-story 100 x 170-foot transformer plant, to cost about \$150,000. L. C. Mechlin, Maloney Bldg., is architect.

RHODE ISLAND

PROVIDENCE, R. I.—Monowatt Corp., 66 Russell St., has let contract to Rowley Construction Co., 260 Central Ave., Pawtucket, R. I., for a one-story 80 x 135-foot plant building costing about \$100,000.

PROVIDENCE, R. I.—Nicholson File Co., 23 Acorn St., has let contract to F. A. Menzies, 522 Hospital Trust Bldg., for important plant alterations, to cost about \$75,000. L. A. Gardiner, 49 Hanover St., is architect.

TO SELECT—

"Industrial Gear" as your ONE source for gears, racks and sprockets and to make "Industrial" dependability an integral part of your production—is your sure way to the right road of supply.

ONE-WAY

Industrial

Devotes its entire facilities exclusively to gears, racks and sprockets. Machinery manufacturers who look for outstanding performance can thoroughly depend upon "Industrial". Our big plant equipped with the latest machinery and manned by craftsmen with ability to manufacture fine gears consistently, is at your service.



GEARS • RACKS • SPROCKETS

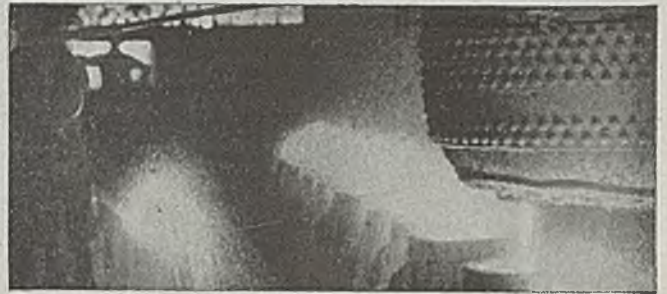
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272 page catalog and handbook—a valuable work book sent when requested on company letterhead.

INDUSTRIAL GEAR MFG. CO.

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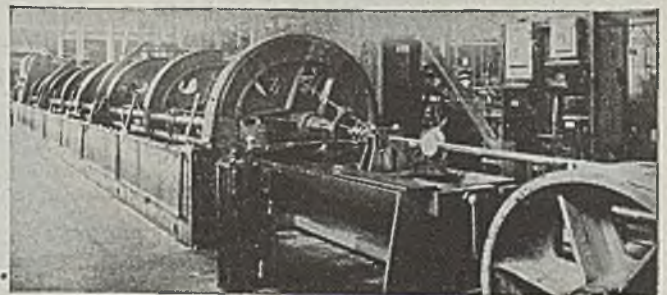
FROM THE MAKING OF THE STEEL—



THROUGH PROCESSING THE WIRE—



TO FABRICATING THE WIRE ROPE—



WICKWIRE SPENCER WIRE ROPE

is safeguarded by continued, careful control to assure the utmost in performance, safety and long life. Wickwire Spencer Wire Rope is available in all sizes and constructions—both regular lay and WISSCOLAY *Preformed*.

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Thousands of wire rope users—old hands and new—have found "Know Your Ropes" of inestimable value in lengthening life of wire rope. Contains 78 "right and wrong" illustrations, 41 wire rope life savers, 20 diagrams, tables, graphs and charts.

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DRY-CYANIDING

Solves many problems in case-hardening light sections made from mild steels

- 1 Harder case
- 2 Tougher core
- 3 Far less warpage
- 4 Low price per lb.
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BETTER HARDENING—
BETTER RESULTS

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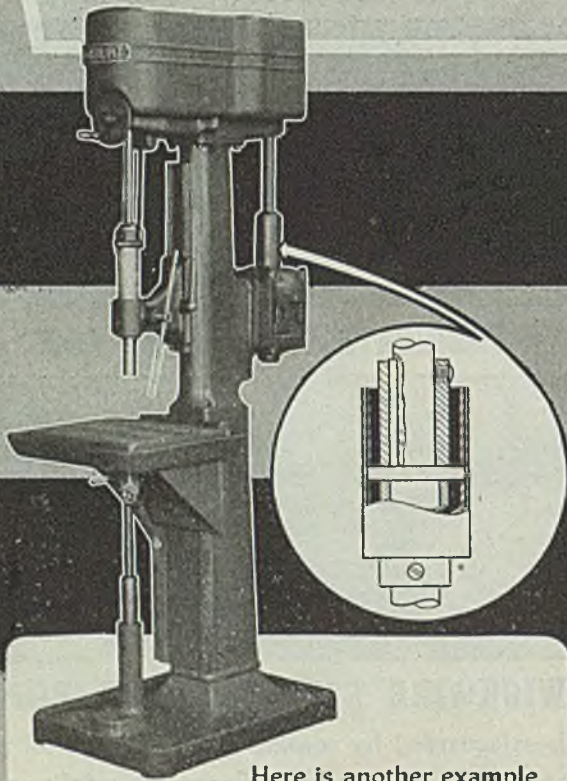


PERFECTION

TOOL & METAL HEAT TREATING CO.

1740-58 WEST HUBBARD STREET CHICAGO 22, ILL.

MODERN high speed drills *equipped with* HARRIS BEARINGS



Here is another example of how Torflex Bearings have been successfully used as a coupling in a modern machine tool—in this instance a Foote-Burt Number 2 Sensitive Drill.

In this case Torflex Bearings are used to simplify alignment problems between two shafts and smooth out vibration. The Coupling also eliminates the danger of shaft breakage.

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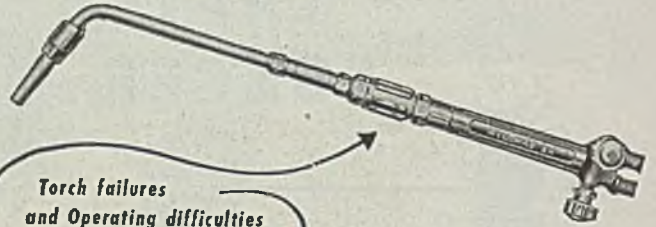
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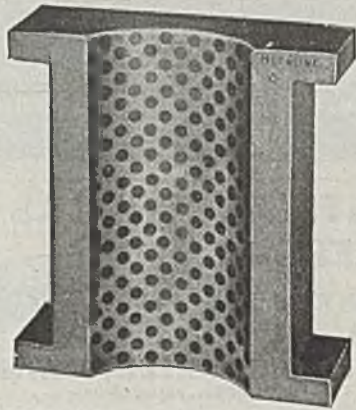
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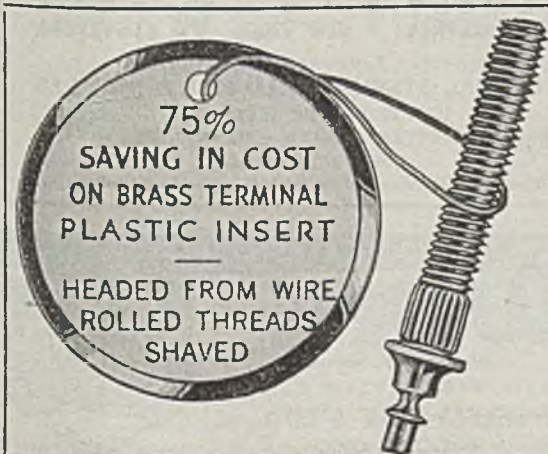
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