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STEEL

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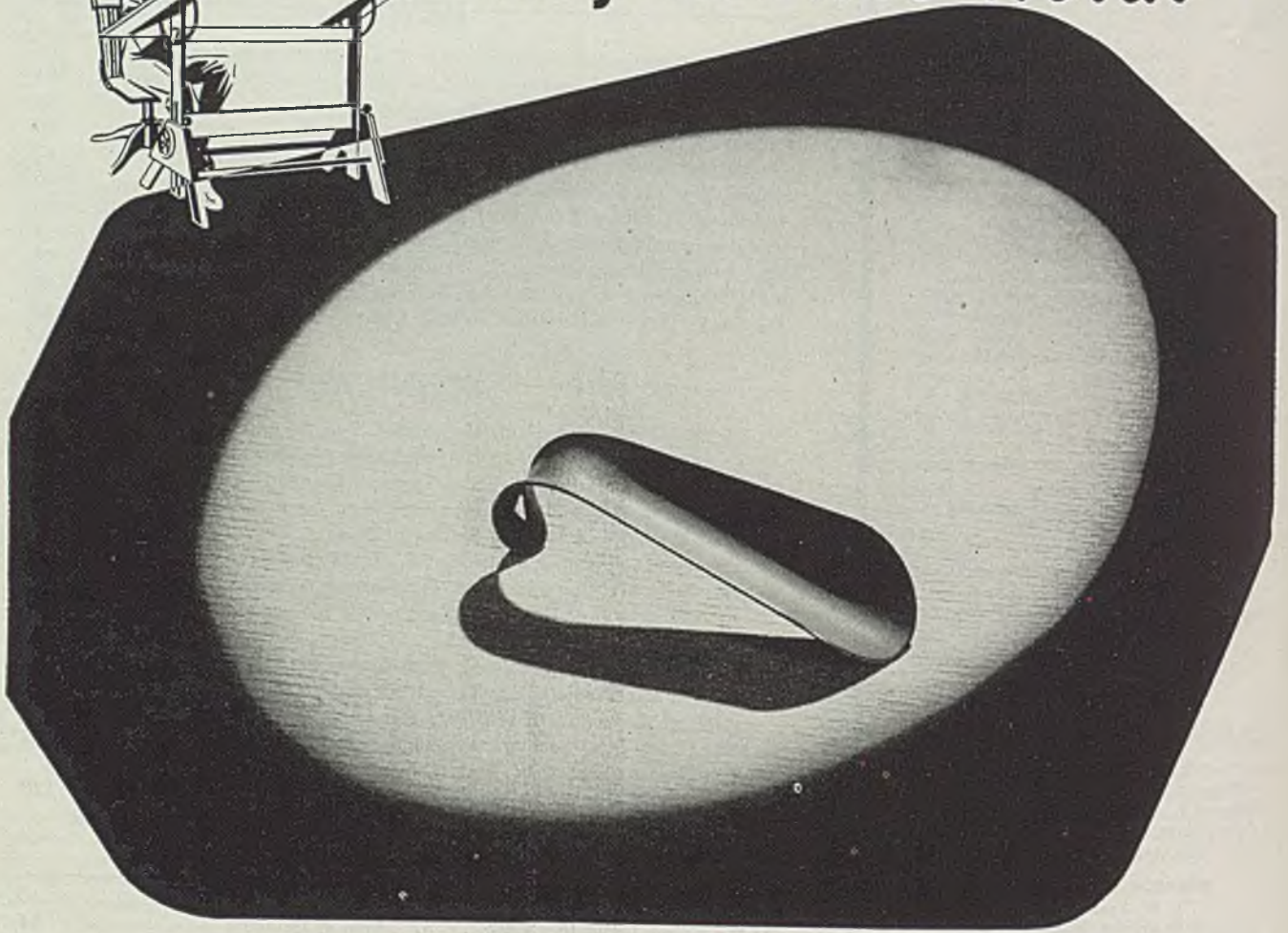
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The DESIGN ENGINEER who threw away his *SHOE HORN*



Here was a man of vision. On paper he could squeeze and stretch more performance out of a standard motor than anyone else would dream of—least of all the motor manufacturer. Of course, once the machines were built he seemed to have more than his share of trouble.

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Persistent Sabotage

In his essay on "Business and the Radical Indictment," which appeared first in the Summer 1945 issue of the Harvard Business Review and since has been reprinted and widely quoted, David McCord Wright cites four types of economic policy now being advocated in the modern world:

"1. Blind adherence to laissez faire.

"2. Planned monopolistic combination and logrolled stagnation by business, labor and government.

"3. Full-fledged socialism or fascism.

"4. A program of removing barriers to investment and production which will give the utmost possible freedom to capitalistic machinery, but which will stand ready to forestall disastrous deflation by the injection of purchasing power."

In the United States individuals who openly advocate the first three of these policies are few in number. An overwhelming majority of the people and all but a very few persons in high public office favor the fourth policy—continued adherence to the capitalistic system with such refinements as may improve it.

In view of this decisive advocacy of the capitalistic system, it is curious that we entertain such grave fear for its future. This fear does not come from a conviction that the proponents of laissez faire, planned economy, socialism or fascism will force one of their systems upon us. It comes from the danger that we will hamstring our present system so seriously that it will deteriorate through impotency and give way to some other system.

This danger is real. A notorious example is the report issued last November by the Department of Commerce that automobile manufacturers could increase wages 15 per cent in 1946 and 10 per cent in 1947, without raising prices, and still earn profits greater than those realized prewar. This absurd fallacy was taken up by gullible Washington and it actually colored national policies for months before President Truman repudiated it and Secretary Wallace said it was all a mistake.

Here is a blunder of great magnitude which has cost the nation billions of dollars. It is sabotage of the capitalistic system. It is typical of the all-too prevalent current practice in Washington to give eloquent lip service to the private enterprise system at the same time that termites in the top-heavy and unmanageable structure of bureaucracy are constantly undermining the foundations of that system.

It is time that the fine words spoken in behalf of the American system of private enterprise by persons in high positions be matched by something more constructive than persistent, if not malicious, sabotage.



March 25, 1946

INDUSTRY BOUNDS BACK: If evidence were needed to demonstrate the resilience of American industry, it is available in current statistics. Although a number of major strikes were settled only a few weeks ago, numerous strikes still are in progress and many government policies present difficult obstacles to production, the statistical record of industrial activity is extremely reassuring.

This publication's index of industrial activity in the metalworking industries stands at the highest point recorded since V-J Day. This reflects the

rapid recovery of the steel and automotive industries from strike-bound lows. During the week ended March 16, output of steel and assembly of motor cars touched new postwar highs.

A new high for soft coal production for 1946 was recorded in the week ended March 9. To date, coal output is running 4.5 per cent ahead of production in 1945. Revenue freight car loadings to date are only 4.5 per cent below loadings in the comparable period of 1945. Consumption of electric power thus far this year is off only 11 per cent from cor-

(OVER)

responding 1945 figures. Volume of building permits in February, except for that in December and January, is higher than in any month since October, 1929.

These figures mean simply that if industry is given half a chance, it will "go to town" in a big way.

—pp. 150, 151

SAWING BY FRICTION: Friction sawing of steel has made notable progress in recent years. It seems almost incredible that a band saw operating at speeds up to 15,000 fpm can cut through tungsten, manganese, nickel or other tough steels so rapidly and with so little punishment to saw by the heat generated by friction.

Credit for this achievement must be shared by the manufacturers of precision saw bands and the builders of friction sawing machines. The former had a start on the latter in that suitable saw bands were available long before machines of proper speed, power and rigidity were procurable. When sturdy equipment came into being, saw bands could be operated at speeds which introduced an almost revolutionary sawing technique. Imagine 3,240,000 saw teeth slicing through tungsten steel at a blade velocity of 15,000 fpm! This is what happens when a 255-in., 18-pitch band saw goes into action on a modern friction sawing machine.

—p. 95

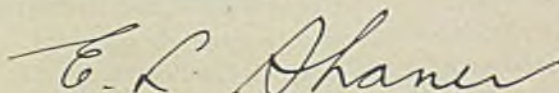
SHIFTS IN STEEL USE: American Iron & Steel Institute's breakdown of the distribution of finished steel in 1945 indicates that consumption since V-J Day is tending toward prewar patterns. Purchases of steel from jobbers topped consumption by any other consuming group. Other consuming classifications, in order of tonnage, were ordnance, steel for conversion, railroads, construction, containers, exports, pressed and stamped products, ships, automotive, machinery, oil and gas and agriculture.

The principal change from wartime consumption is found in the sharp drop in steel for ships, which shifts shipbuilding from first to ninth rank in tonnage consumed. Jobbers, railroads, construction, containers, pressed and stamped products and automotive classifications each advanced in rank in 1945.

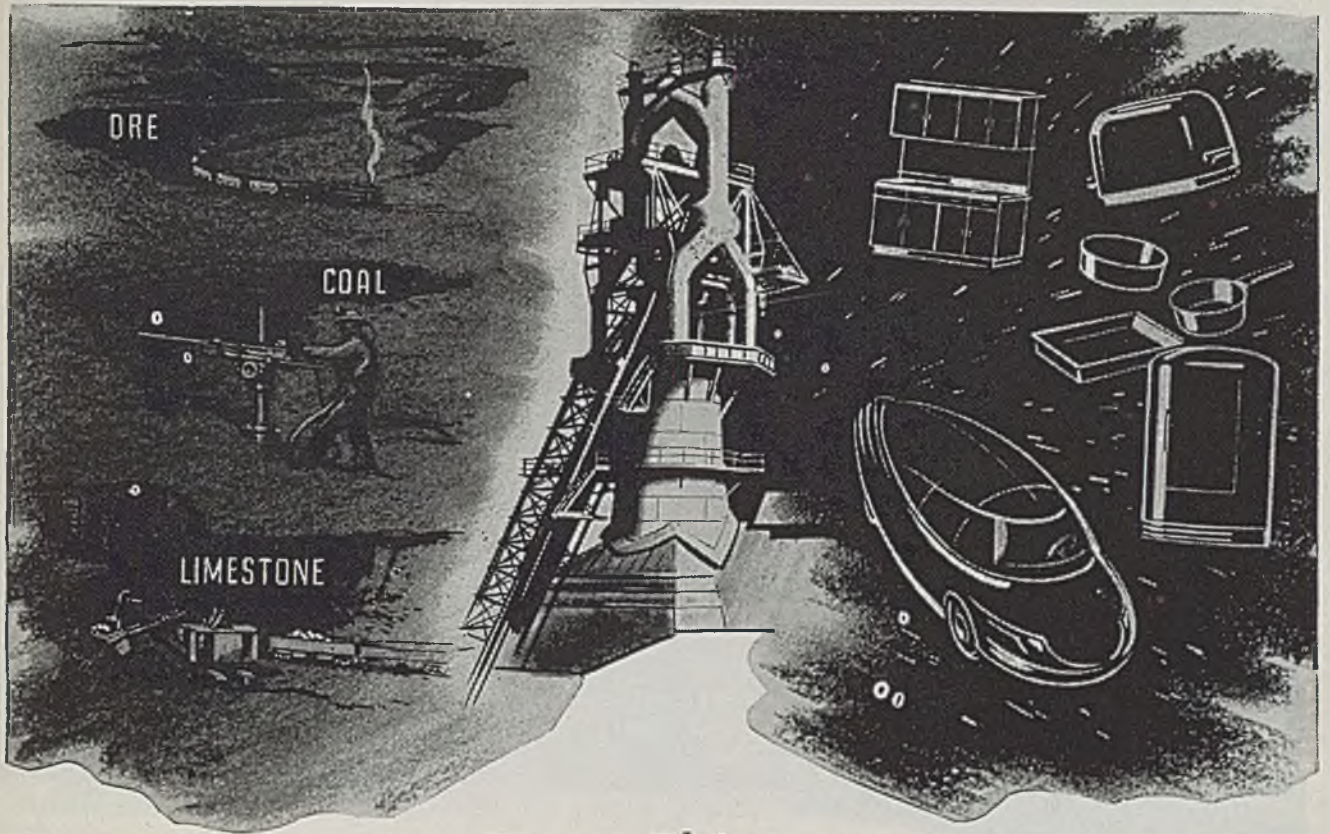
Another year may be required to bring consumption back to a peacetime pattern. In prewar years the chief consumers were automotive, construction, railroads, containers and jobbers. In 1945 these classifications, with the exception of automotive, were not far from their accustomed prewar positions. The next annual compilation probably will show automotive consumption in first or second rank.

—p. 66

SIGNS OF THE TIMES: Striking graphs and blown-up text type executed in poster effects—long a technique employed in advertising presentations—seem to appeal strongly to members of Congress. Chester Bowles, Robert R. Wason, new president of NAM, and others (p. 73) have used this type of presentation effectively in appearances before House and Senate committees. . . . To meet postwar demands for steel, steelmakers plan to spend \$327 million in 1946 (p. 74) for new equipment and additional facilities. . . . Removal of OPA ceiling prices on all parts going into truck manufacture as original equipment, except tires, batteries, radios and steel castings (p. 78), belatedly removes a barrier that had been seriously retarding truck production. . . . Setup time on a new 5-spindle automatic is reduced sharply (p. 90) through the use of a quadrant linkage instead of conventional cams. . . . House Territories Committee, reporting on opportunities in Alaska (p. 80), asserts that improved rail, water, highway and air transportation facilities must be provided before marked expansion of industrial activity can be expected. Attractive potentials are seen in Alaska's fishing, timber and fur industries. . . . Secretary of Commerce Wallace has practically repudiated the department's mysterious report of last November to the effect the automobile industry in 1946 and 1947 could raise wages 25 per cent without increasing selling prices. However, disavowal was not forthcoming until four months after the hoax was perpetrated (p. 78)—until so much harm had been done that the incident should go down in history as a "billion dollar blunder". . . . The Great Lakes iron ore fleet awaits the opening of the 1946 shipping season on about April 15 (p. 67) with the prospect of carrying to lower lake ports approximately 60,000,000 tons of ore this year. . . . Stocks of tin in the United States on Jan. 1 totaled only 91,623 long tons compared with 107,212 tons as of Jan. 1, 1945. The decline is due to limited imports (p. 89) and authorities predict that a reasonable balance between supply and demand cannot be expected before late 1947. . . . Installation of a 1000-kv x-ray unit in the steel foundry of Bethlehem Steel Co. at Bethlehem is noteworthy in that unusual provisions have been made (p. 122) to insure easy manipulation of x-ray unit and products with the utmost of safety. . . . OPA has lifted ceilings on pig iron prices by 75 cents (p. 64)—the third advance under OPA jurisdiction.



EDITOR-IN-CHIEF



Finer Things Are Coming Out of the Ground

From the ore ranges, the coal fields, and the limestone beds are coming vast quantities of blended iron ore, coking coal, and purest limestone — the principal ingredients for making steel, the “master metal” of our industrial age.

These ingredients are stored in huge stock piles at the Inland docks. Daily, thousands of tons of coal are made into coke, and this coke, with iron ore and limestone, is charged into blast furnaces—the first step in making controlled quality steel—the first step in producing the finer things that come to us from out of the ground.

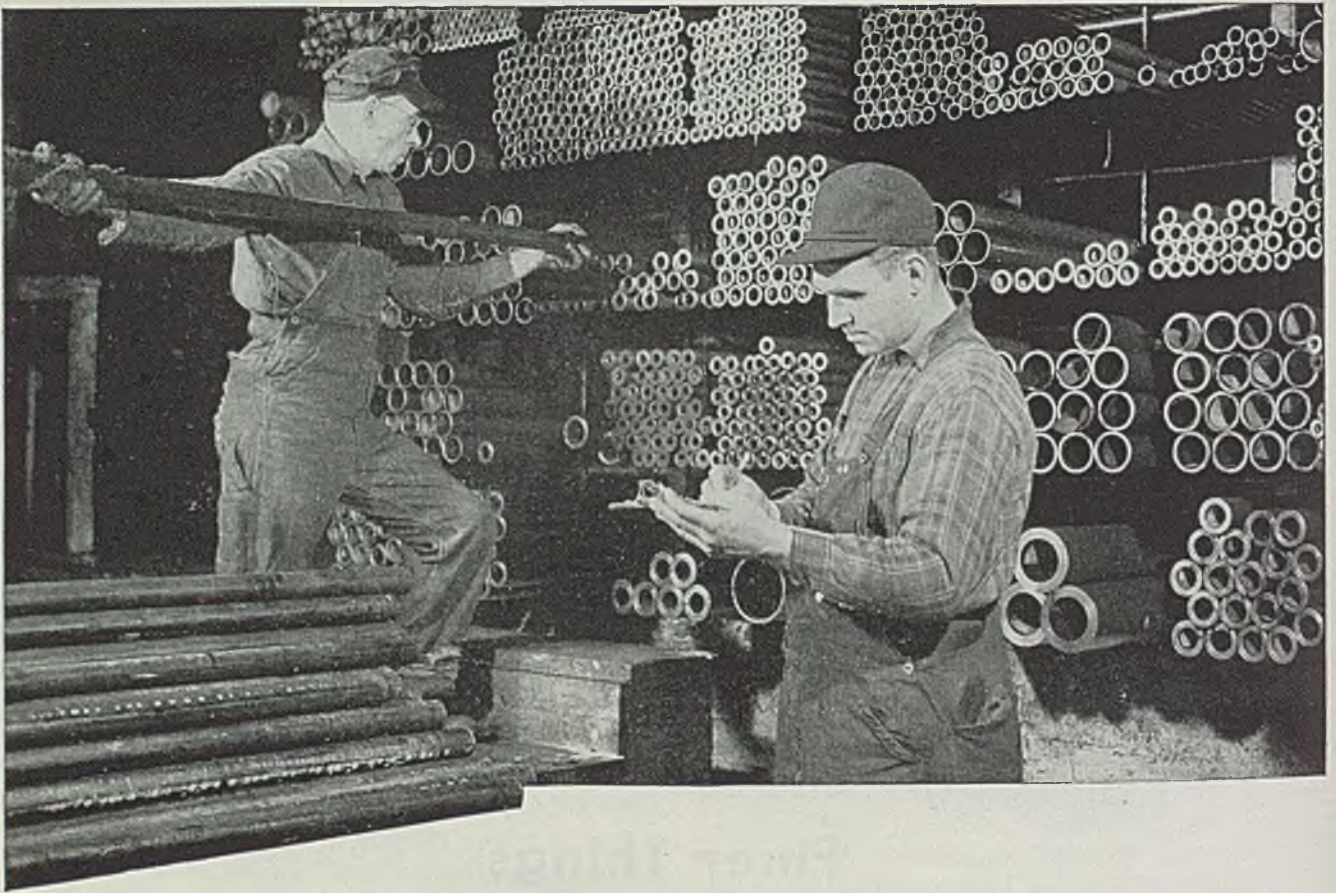
Inland metallurgists are constantly testing

and re-testing, melting and re-melting, adding one element and taking away another—always seeking for something better. Already they have contributed many new methods and new steels to American industry.

These, and the newer Inland steels which are coming from continued intensive research, will help you meet the needs of America.

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ting and shipment assures quick service. Mill shipments also handled promptly. Whatever your requirement or problem, call on the tubing specialist at your nearby Ryerson Plant.

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RYERSON STEEL



Strikers at Chevrolet Gear & Axle Division of General Motors vote to accept the national accord between the corporation and UAW-CIO, ending the four-month strike. NEA photo

Materials, Components Shortages Now Chief Obstacle to Peak Output

Major strikes, with exception of coal, settled or in final stages of negotiation. Industry faces period of acceleration to large-scale production after seven-month lag due to work stoppages and price controls

WITH most reconversion - plugging strikes settled or in the final stages of negotiation, the metalworking industries are setting their sights on making up the loss in time and production of badly needed civilian goods.

Manufacture of most hard items has lagged behind expectations in the more than seven months since the war ended, despite the fact that physical reconversion of plants was accomplished more rapidly than expected.

The lag in production has been particularly noticeable in automobiles, farm implements, building materials, steel, household appliances and electrical goods.

Primarily the lower-than-anticipated volume was due to work stoppages in the automotive, steel, electrical and related industries.

Another important cause has been the

price control policies of the Office of Price Administration.

Stemming from both these primary restrictions has been a shortage of materials and components. This scarcity of parts and materials now constitutes the greatest obstacle to large-scale production, although price ceilings in many industries still must be adjusted before all-out production can be attained.

Despite settlement of the steel, automotive and electrical strikes, labor difficulties still remain to be ironed out. Thousands of the smaller companies must be adjusted to the new wage-price plateau which the government has created for industry.

Overshadowing the labor picture at present is the possibility of a walkout in the bituminous coal fields in April. Miners and operators last week got down

to actual bargaining on a new contract following presentation of "negotiable" demands by both sides, Countering the miners' demands (STEEL, March 18, p. 75), the operators proposed:

"1. Suitable guarantee by the international union against wildcat strikes and slowdowns in production.

"2. A redefinition of qualifications for vacation pay.

"3. Elimination of pay for lunch periods.

"4. Substitution of 8 hours for 7 hours and 40 hours for 35 hours as the point at which overtime payment begins, to conform to the standard work-day and week established by federal legislation."

Although the operators are asking for overtime to begin after 40 instead of 35 hours, it was reported they were inclined to make an adjustment in rates to bring them above the \$1 hourly rate set in 1941.

Pending outcome of the soft coal negotiations, other segments of industry are proceeding cautiously. Some companies hesitate to expand operations to capacity and deplete coal stocks until they are assured the mines will continue to op-

erate. Lake shippers are loath to start shipping available coal to the upper lakes in the face of the possibility of a coal strike.

For many metalworking companies the period of accelerating production to peak levels is still ahead, instead of having been accomplished in October, November and December as planned.

The automotive industry reckons it has lost production of at least 1,000,000 vehicles due to strikes and other avoidable causes since V-J Day.

George Romney, general manager of the Automobile Manufacturers Association, says any approach to the goal of 3,320,000 cars and 750,000 trucks for the remainder of 1946 requires that "management, workers, suppliers and government—most of all government—must join hands and get going." Blaming government controls and regulations for much of the loss in production so far, Mr. Romney warns that "continued bungling could needlessly deprive the country of about 1,500,000 more vehicles this year, representing about \$1.5 billion in purchasing power."

The automotive supplying industries, said Mr. Romney, are handicapped by "more than 600 price regulations issued by OPA and hundreds of supplementary orders, supplementary regulations and amendments."

Production Off to Slow Start

Return to production after settlement of strikes is proving to be slow. Steel production reached the pre-strike rate for the first time last week. General Motors workers have lost more than a week since their 4-month strike was officially ended, and considerable more time will elapse before large-scale production can be attained.

General Electric workers started back to work last Tuesday, but company officials warned that several days to several weeks would elapse before many workers could be reinstated. "It may be a matter of weeks before some of the factories are where they were before the strike," President C. E. Wilson explained. He pointed out that engineering work had been seriously affected by the strike, scarce materials have been diverted by suppliers to other users during the stoppage and difficulties will be encountered in rechanneling materials.

Production of critical farm equipment has been slowed by strikes at the Oliver Corp. (recently settled after four and a half months), at International Harvester Co., J. I. Case and other companies. The Republican Congressional Food Study Committee estimates that "even under the most favorable conditions, production (of farm machinery) now con-



Blueprints for proposed changes in the Fisher Body die and machine shop at Detroit are examined by General Foreman Theodore Diawold, left, and Shop Foreman Bill Kennedy as General Motors readies plans for large-scale production after four months of idleness. NEA photo

templated for 1946 can hardly come up to the unsatisfactory output of 1945."

Despite the lag in production caused by strikes and price ceilings, the Federal Reserve Board last week reported:

"Production in the whole economy, including agricultural as well as nonagricultural types of activity, is now above the level of any previous peacetime period and substantially above the average for the years 1935 to 1939. Employment in

all major lines of activity, except agriculture, mining and construction, is above the advanced 1941 level."

Unemployment in February, according to the FRB, was around 2,700,000, compared with an average of 5,000,000 in 1941 and 9,000,000 in 1939.

Outlook for production through 1946 in leading manufacturing areas is presented in the following reports from STEEL's district editors.

Scarcity of Materials and Components To Retard Output through Most of 1946

PITTSBURGH

SCARCITY of steel and components will continue to be a retarding factor in production of civilian goods through most of this year.

Strikes among the metalworking and steel producing companies for the most part have been settled, but the effects of these stoppages will be felt for some time to come and high-volume output before autumn is unlikely.

Another obstacle to large-scale production is the price muddle, and still another is the inability of management to obtain from their employees a full day's work for a day's pay.

Steel fabricating plants in this district were closed during the recent steel strike and many remained closed for several

weeks after the basic steel strike was settled. Shutdown of these plants has contributed to the critical shortage of fractional horsepower motors, heating elements, ball bearings, housing materials and other components and materials.

The electrical industry has a tremendous order backlog on fractional horsepower motors.

Westinghouse would have a 12 months' backlog of these motors even if they had not been struck.

Under present price ceilings and steadily rising production costs, officials of many metalworking companies believe the only way profitable operations can be realized is through increased output per employee. While not incorporated in all union contracts there has been definite

understanding between company and union officials permitting reduction in working force for certain specific operations with no loss in production. Only through greater productivity per man through this means, or by installation of materials handling systems and other engineering production improvements, can most smaller companies weather the present squeeze on profit margins.

Upturn in Employment Expected at Cleveland

CLEVELAND

Settlement of local issues at struck automotive plants in this area continue to prevent full-scale resumption of manufacturing operations. However, prospects for expansion of civilian goods production are greatly improved with steelmaking operations in the district at about 95 per cent of ingot capacity, 10 points above the level in effect just prior to the calling of the steel strike Jan. 21.

Cleveland business and industry have been doing fairly well considering the troubled labor situation and material shortages.

Strikers returned to work at the plants of the Timken Roller Bearing Co., Canton, O., last week with the understanding that the issues involved would be negotiated.

Twenty-three plants in the area expect to increase employment in March while only four anticipate a decrease, and 35 look for no change. The average work week in the district dropped from 43.5 hours at the end of January to 41.9 at the end of February, the drop being due largely to the fact plant operations were scheduled in accordance with parts and materials supplies.

Prospects for Higher Production Encouraging

BUFFALO

Mixed tendencies mark the swing to civilian production in this area as labor disturbances, although diminishing, are still felt in many plants. While the employment-production outlook is favorable there are approximately 42,000 civilians seeking unemployment insurance payments and 15,000 idle veterans asking adjustment allowances.

Ford's local plant has resumed production with a shade over 200 units a day and 1400 workers. These figures are slated to hit 400 cars a day and approximately 2000 workers within 60 days. The General Motors Chevrolet Division plants here plan record-breaking production of motors and axles and a new employment peak of 10,000.

Outlook for Full Production of Civilian Goods Disappointing in Middle West

CHICAGO

ANYTHING approaching full production of civilian goods in this district is still weeks if not months away. Factors contributing to this disappointing outlook are lack of steel; lack of components, such as castings, electric motors and controls, etc.; and threat of a coal strike April 1.

Steel mills just last week attained an ingot production equal to that before the steel strike. Flow of finished rolled products is close to the pre-strike level, but is being so widely fanned out that individual consumers do not get enough either in tonnage or product variety to restore manufacturing operations to full capacity. Weeks will be required to overcome these handicaps.

Some strikes in the electrical industry continue and it will be some time before flow of electric motors and equipment needed in large quantities for civilian goods can be restored. A number of farm implement makers are still down by strikes and the end is not yet foreseen.

Most fabricators report they are just now getting shipment of material allocated to them for January.

New England Factories Hindered by Shortages

BOSTON

Material shortages, especially steel and parts, are retarding resumption of volume production in numerous instances, although most strikes have terminated or appear about to end. Work stoppages at the General Electric Co. and Westinghouse Electric Corp. plants in New England have dented the postwar programs seriously. At best these shops will not be producing products in high volume for some weeks, although steel will be moving to them in better volume before.

Output Accelerating, but Shortages Are Handicap

NEW YORK

Producers of civilian products are stepping up production on an increasingly faster scale, now that the steel strike is over and labor difficulties at many of the metal working plants are becoming adjusted. However, certain of the larger manufacturers, such as the General Electric Co., which have only recently settled their differences with labor and

which have been strikebound for a considerable time, expect that it will be at least another couple of weeks before they can get their operations sufficiently organized to get into normal production.

In practically all cases shortages of material are a severe handicap.

James M. Hill Heads New International Steel Corp.

James M. Hill, who has resigned as chairman of the Empire Steel Corp., Mansfield, O., has become president and chairman of the newly formed International Steel Corp. organized "to act as a management consultant and to acquire and operate steel companies, both here and abroad."

Mr. Hill will continue as director and consultant at Empire Steel.

Barium Steel Acquires Central Iron & Steel

Barium Steel Corp., Canton, O., has acquired control of the Central Iron & Steel Co., plate producer of Harrisburg, Pa., through purchase of the Vance McCormick interests.

Originally known as the Central Iron Works, which was formed in 1853, the Central Iron & Steel Co. was organized in 1897 by the consolidation of Central Iron Works with the Paxton Rolling Mills, which had been established in 1869.

Barium Steel announces that no change in the operating management of Central Iron & Steel Co. is contemplated.

White Heads Waste Trade Dealers Association

Paul J. White, Great Eastern Packing & Paper Co., New York, was elected president, National Association of Waste Material Dealers Inc., at the annual meeting in New York last week. Joseph Tyroler, Tyroler Metals Inc., Cleveland, was re-elected first vice president, Julius Muehlstein of H. Muehlstein & Co., New York, second vice president, and Robert Miller, R. & V. Miller Inc., Newark, N. J., third vice president.

In reviewing the outlook for steel scrap, E. C. Barringer, president, Institute of Scrap Iron & Steel, said the supply of steel grades will expand but that special action was needed to get out more cast iron for consumption.

Increase on Iron Is Held Inadequate

Prices of all grades, except charcoal, advanced 75 cents per gross ton. Producers contend it falls short of covering higher costs

INCREASE of 75 cents per gross ton in ceiling prices for pig iron, authorized by the Office of Price Administration as of March 15, is not adequate to cover the accumulative increase in costs, according to leading producers.

The price advance is applicable to all grades except charcoal pig iron.

This is the third increase in pig iron prices granted by OPA since 1941, when price control began, and in each instance the price agency has announced that action was taken to permit the industry to earn its 1936-1939 rate of return while the industry has maintained that each increase fell short of covering higher production costs. A recent survey by OPA revealed that producers have granted wage increases which would lower the industry's rate of profit, on the basis of former prices, below that for the base period.

The first price increase was \$1 a gross ton, granted Feb. 14, 1945. The second was 75 cents a ton, which became effective Oct. 23, 1945.

OPA issued the following statement in conjunction with the latest price advance announcement: "In determining the amount of the adjustment in maximum prices for pig iron needed to satisfy the standard prescribed in executive order 9697, OPA used as a starting point adjusted data reflecting the fourth quarter of 1945 experience of the eight representative companies included in the study.

"These figures were then corrected to give full effect to the increase in maximum prices made in October, 1945, and known cost increases which were not included, or only partially included, in the fourth quarter.

"Next appropriate adjustments, both upward and downward, were made on account of changes in costs and volume which may reasonably be expected to occur in the next 12 months, and the final result was converted to an annual basis."



DISCUSS WELDING PROBLEM: C. B. Voldrich, left, supervisor of welding research at Battelle Institute, Columbus, O., talks over a naval welding problem with Battelle Director Clyde Williams, center, and Dr. S. L. Hoyt, technical advisor. The research institute recently was awarded the Naval Ordnance Development Award in recognition of distinguished service to naval ordnance development

OPA Clarifies Amendment to Price Schedule No. 6 as It Applies to Steel Products

PARTIAL clarification of amendment 15 to revised price schedule No. 6, granting varying increases in maximum prices for iron and steel products, has been issued by the Office of Price Administration. Sellers are still awaiting further clarification of that portion of the amendment which stated that "all alloy steel products except stainless—increase the applicable maximum price (base price plus extras) otherwise established by schedule No. 6 by 4 per cent." Some producers are seeking an entirely new basis for advancing alloy product prices.

OPA pointed out in its interpretative letter that, of necessity, the product descriptions were stated in broad terms and a number of questions have arisen concerning the classification of particular items. In order to remove the possibility of error on the part of persons subject to the schedule, it was deemed advisable to make the following rulings:

1. Tight cooperage and slack barrel hoops are a variety of hot-rolled strip and customarily have been priced on the same basis as the latter commodity. Accordingly, their base prices may be increased by the applicable amount set forth in amendment 15 for hot-rolled strip. Tobacco hoghead hoops, have been customarily sold on a per cent basis and therefore received an increase of 8.2 per cent.

2. Culvert sheets receive the same in-

crease as galvanized sheets.

3. Wire tacks retain the classification of "a type of wire nails" for the purpose of amendment 15 and received an increase of 35 cents per 100 pounds.

4. Increase in the maximum price for roofing and siding is to be determined by reference to the flat rolled product from which it is made. Thus, the base price for galvanized roofing and siding was increased 35 cents per 100 pounds while roofing and siding made from hot-rolled sheets was increased 22.5 cents per 100 pounds.

5. Nitralloy is an alloy steel and received an increase of 4 per cent on base price and extras.

6. The applicable increases granted for low-alloy, high-tensile steels are to be determined by reference to the seller's customary pricing practice. If a producer customarily priced a particular low-alloy high-tensile steel product by the use of alloy steel extras, such product shall be considered an alloy steel for the purpose of determining the amount of the increase granted by amendment 15. If the producer customarily priced the product by the use of carbon steel extras, the increase shall be the same as that granted for the same product form made from carbon steel.

7. The dividing line between cold-rolled strip and cold-rolled spring steel is different for various producers. Each producer must follow his customary

practice in determining the applicable increase. Thus, material which the producer customarily sold as cold-rolled strip received an increase of 25 cents per 100 pounds while material customarily classified as cold-rolled spring steel takes an increase of 8.2 per cent on base price and extras.

8. Splice bars received an increase of 15 cents per 100 pounds, even though they are sold in pairs.

9. Mine ties take an increase of 8.2 per cent on base price and extras.

10. The increase on die rolled sections is to be determined by the producer's customary practice. If he customarily priced them on a hot-rolled bar base, they take the same increase as such bars (25 cents per 100 pounds); if he customarily priced them as a semifinished product base, they take the increase applicable to such products.

11. Red hard sheets are a variety of hot-rolled sheet and take the same increase (22.5 cents per 100 pounds).

12. Increases granted for pipe and oil country tubular goods may be computed by making the appropriate reduction in the applicable "off" discounts. Thus, the increase of \$8 per ton for butt weld and lap weld may be accomplished by reducing the applicable discounts by 3 points while the \$5 increase for electric weld and seamless may be figured by reducing discounts by 2.5 points.

Auto Repair Parts Price Relief Procedure Revised

Producers of automotive parts for repair or replacement use were given a new procedure by the Office of Price Administration last week to use in applying to the price agency for adjustments in ceiling prices where required to maintain production.

The procedure becomes effective Mar. 25, 1946.

Under the procedure, an automotive parts manufacturer may apply for an adjustment for all of his products, a line of his products, or a single item.

OPA also announced a modification of the method by which manufacturers of industrial machinery and equipment generally may obtain price adjustments to cover allowable costs plus allowable profit.

Features of the modification are:

1. A manufacturer may apply for an adjustment on the basis of a profit and loss statement filed for the division or divisions of his company which manufacture 90 per cent or more of the machinery products of the company.

2. In a case where the division of the company which applies for price relief is only a partly-owned subsidiary, the

price agency may permit adjustments to cover allowable costs plus an allowable profit.

3. In cases where extreme administrative burden to the manufacturer or to the price agency would result from a requirement that a manufacturer engaged in many lines of business file a profit and loss statement covering all his operations, OPA may permit adjustments

to cover allowable costs plus an allowable profit on the basis of a divisional statement only.

The price agency also announced that when a manufacturer of machinery products obtains an adjustment in his ceiling prices, resellers of the products may pass on to their customers the dollar-and-cent amount of the increase unless OPA specifically states otherwise.

Present, Past and Pending

■ NORTH WADE MINE ON MESABI RANGE TO BE OPENED

ISHPEMING, MICH.—North Wade open pit iron ore mine near Kinney, Minn., on the Mesabi Range will be brought into production this season as a joint operation by Inland Steel Co., Chicago, and Cleveland-Cliffs Iron Co., Cleveland.

■ EXPORT OF CERTAIN STEEL PRODUCTS RESTRICTED

WASHINGTON—Restrictions have been placed on the export of structural iron and steel buildings, prefabricated and portable houses, metal window frames and window sash, metal shutters, steel culverts, prefabricated doors, copper wire, roof ventilators, sheet metal duct and certain zinc products by the Department of Commerce.

■ POWERFUL BUZZ BOMBS BEING TESTED AT WRIGHT FIELD

DAYTON, O.—Buzz bombs with engines more powerful and reliable in flight than any devised by the Germans are being power-tested at Wright Field here.

■ COASTWISE SHIPPING REGULATIONS RESTORED

WASHINGTON—Prewar restrictions on Canadian vessels shipping between American ports are restored in H. R. 5316, passed by the House recently. Restrictions were suspended for the duration of hostilities by a special act passed in 1942.

■ U. S. STEEL GRANTED EXTENSION IN BASING POINT CASE

PHILADELPHIA—Third Circuit Court of Appeals has extended to April 8 the time within which United States Steel Corp. may decide to apply for leave to adduce new evidence to prove the Federal Trade Commission cease and desist order of 1928, affecting basing points, should be set aside because of changed conditions.

■ EXPECT HIGHER PRICES ON ALL METAL STAMPINGS

WASHINGTON—Increased ceiling prices on metal stampings in all classifications are expected to be announced soon.

■ E. C. BULLARD HEADS MACHINE TOOL COMPANY

BRIDGEPORT, CONN.—E. C. Bullard has been elected president and general manager, Bullard Co., machine tool builders, succeeding E. P. Bullard, who becomes chairman of the board.

■ DORMAN, LONG TO BUILD 10,000 STEEL CARS

MIDDLESBROUGH, ENGLAND—Dorman, Long & Co. Ltd., has received a contract from the director of Royal Ordnance Factories and the Ministry of Supply for 10,000 steel railroad cars for home railways.

■ PRIORITIES REGULATION 28 CLARIFIED BY CPA

WASHINGTON—Priorities Regulation 28 under which bottleneck-breaking "CC" ratings are issued has been rearranged and clarified by the Civilian Production Administration.

■ WAGE INCREASE FOR REFRACTORY WORKERS APPROVED

WASHINGTON—Wage Stabilization Board has approved wage increases up to 18½ cents an hour for refractory industry employees.

■ STEEL STRIKE WAGE LOSS PLACED AT \$120 MILLION

NEW YORK—An estimated \$120 million in wages were lost by steelworkers in the recent steel strike, according to the American Iron & Steel Institute. Loss in production amounted to 7½ million tons of ingots, equivalent to about 5,250,000 tons of finished steel. Companies in the industry lost about \$330 million in sales and experienced heavy repair costs.

■ CONDENSER SERVICE ACQUIRES EDGE MOOR IRON

NEW YORK—Condenser Service & Engineering Corp., Hoboken, N. J., has acquired control of the Edge Moor Iron Works, Edge Moor, Del. William M. Kennedy, president of Condenser Service will head Edge Moor Iron.

Skilled Worker Shortage Acute On the Coast

Employment situation in area presents paradox with unemployment rising due to surplus of unskilled labor

SAN FRANCISCO

NEARLY seven months after the end of the war, employers on the West Coast find themselves still far from a stable employment situation.

Although, for example, the settlement of the machinists' strike in San Francisco has removed, at least temporarily, the unsettlement of labor troubles of that kind, manufacturers, retailers and enterprises of nearly all varieties are complaining seriously of shortages in working forces.

At the same time, in some parts of the West Coast, unemployment is on the increase.

There are several reasons for this seemingly paradoxical situation.

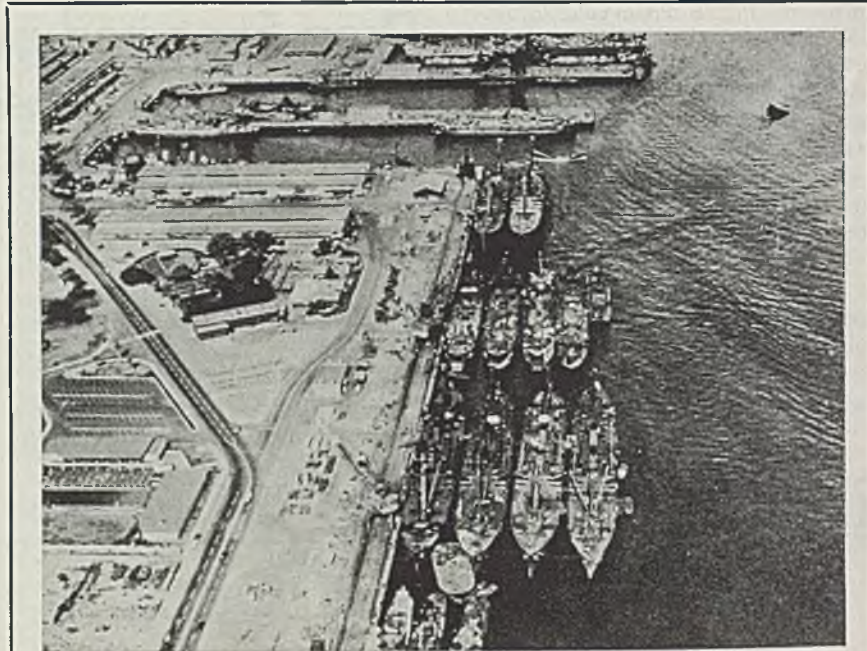
From the viewpoint of shortages, the crying need of many employers in the San Francisco area is for skilled workers. There also is a great demand for office help and stenographers. The United States Employment Service office in San Francisco now has job openings for about 10,000 persons. About 5000 of those are clerical and sales positions. Of the 10,000 total, about 6000 of the demand is for women. Manufacturing plants need about 2200 workers and service industries about 1500.

Unqualified Workers Being Hired

The lack of skilled workers is demonstrated time after time. One large company says its shortage is greater now than at any time in its history, including the war. An oil company, which needs technicians badly, is being forced to hire anyone "with any competence" at all in order to get an adequate staff, although normally many of the people it is acquiring would not be able to compete with trained personnel.

The fact that unemployment in many lines is increasing is because of a surplus of unskilled labor nearly everywhere. Most companies report supplies of this type of workmen either are adequate or that there is an over-supply.

Probably because of their experience in war plants, many job applicants have gained an over-optimistic view of their abilities, says one personnel manager. He



TARGET SHIPS: United States Navy ships assemble at the docks in Pearl Harbor in preparation for Operations Crossroads, first peacetime atomic bomb test. The ships on May 15 will be anchored in the lagoon of the Bikini Atoll group in the Marshall Islands to test the efficiency of the atom bomb against naval targets. NEA photo

reports, and his findings are confirmed by others, that many job-seekers still are selective about the type of employment they think they can fill. In other cases, employers are having trouble keeping workers. "They are hired, work a few days, then decide they don't want to work after all."

Employment service officials report veterans especially are selective about the jobs they take. At the same time, the number of war veterans who are going job-hunting is increasing steadily. During February, for example, about one-third of the 42,000 applicants at San Francisco Employment Service offices were veterans.

During the last week of February, latest available data, total unemployment claims filed in the San Francisco area were 70,152, including 17,300 veterans.

Operations at the Geneva steel mill in Utah virtually have reached a stage of suspension. At present only one coke oven and one blast furnace are being operated and production of pig iron has been reduced to about 17,000 tons a month. Employment has been cut to less than 600 workers from more than 3000 in November of 1944.

As a result of the curtailment, Utah interests who favor continued operation of the mill, and workers who stand to gain employment there, are becoming increasingly restive over governmental

"delays" in disposing of the property.

This attitude was expressed a few days ago by a Utah representative to the House, Walter K. Granger, who said he is becoming "concerned" over the War Assets Corp.'s extension of the bid deadline to May 1. Mr. Granger said it was his intention to protest any further postponement.

Meanwhile, rival labor unions have begun jockeying for control of the Geneva working force. Full participation has been granted to the International Association of Machinists and the International Brotherhood of Electrical Workers as intervenors in the Geneva Steel-United Steelworkers (C. I. O.) hearing relative to the C. I. O.'s petition for certification as bargaining agent for the steel plant.

The machinists and electrical unions, which are affiliated with A.F. of L., will seek to block the C. I. O. move. The A.F. of L. is now bargaining agent for the plant.

Los Angeles Fabricating Strikes Reach Settlement

With one notable exception, strikes in Los Angeles steel fabricating and processing industries have reached full or partial settlements. About 8000 workers have returned to jobs in 37 plants struck at the time of the strike in basic steel.

Labor Situation Becoming More Stabilized in Pacific Northwest

Many disputes resolved with granting of wage increase. Shortage of manpower less apparent, although skilled workers still are needed. Production estimated at 40 per cent of prewar level and expectations are for rise to 75 per cent by July 1

In general, wage increases of 18½ cents an hour were granted except in a few plants where different levels were equalized so that total hourly rates would not vary in various factories.

The exception is the General Motors Corp. South Gate plant where workers remain out pending the end of negotiations between the UAW and management over 14 still unsettled local points of difference.

Principal points, it was disclosed, involve: (1) Choice of shifts by workers; (2) agreements concerning transfer of a man from one job to another; (3) sharing of authority on speed-up plans, with the union helping set production quotas; (4) union objection to slot machines for dispensing soft drinks and foods throughout the factory being substituted for wagons.

Three iron and three steel plants were included in the final settlement pattern. These were Kinney Iron Works, Madsen Iron Works, Dayton Foundry Co. in the former category and Westlectric Steel Castings Co., Warman Steel Co., and Alloy Steel & Metals Co., in the latter.

Harold Ware of the Warman company, one of the negotiators for the management groups, told a STEEL representative that while the OPA has allowed a price increase of about 4 per cent in the field, some 10 to 12 per cent is needed in view of the fact that labor costs have now boosted costs about 20 per cent.

"The immediate future program of action will be aimed at convincing OPA that we can't make a profit at present prices," Mr. Ware said. "How long that will take is anybody's guess. It can't take too long, of course, or the industry will go broke."

Other industry spokesmen pointed out that wage increases as given could be listed on OPA price increase applications as added costs only after the increases were granted, not before, which puts industry on the defensive in the wage-price adjustment program.

Factory Employment Declines in February

Uptrend in California manufacturing employment which began late last year was checked seriously in February by strikes, the California state division of labor statistics reported.

At the middle of last month, the number of wage earners in California factories had dropped to 388,000 from 400,000 in January.

Approximately 10,000 of the total decline was in durable goods industries, which were most affected by labor disturbances. Employment in industries not affected by strikes either remained stable or showed moderate gains.

SEATTLE

STEEL labor troubles in this area are being resolved. Manpower shortages are less apparent although there still is a lack of skilled labor. The general situation is more stable as various crafts conclude negotiations for increased pay. Many men, terminated from war jobs, have refused to accept lower wages and have been receiving unemployment compensation. However, the six-month period for this aid will soon expire and employers are expecting many to return to work.

Differences with 800 foundry workers at Portland and 70 patternmakers have been settled and work has resumed. The agreement provides \$1.85 an hour, a 22-cent increase. The union had demanded \$1.88. Seattle boilermakers have accepted an offer of an increase ranging from 16 to 18 cents an hour, 15 to 17 per cent, plus vacations and other concessions.

Boeing has concluded an agreement with the union, retroactive to Feb. 1, granting a general wage increase of 15 per cent. The minimum wage for grade I workers was raised from \$1.60 to \$1.80 an hour, the general minimum from 82½¢ to \$1 an hour. This is said to be the highest airplane factory scale in the country. The new wage applies to 5000 workers.

Boeing To Add 3000 Workers

The company has announced a \$15 million contract for a fleet of ten 105-passenger, double-decked Stratocruisers for the Northwest Airlines. More than 3000 new workers will be added to the local plant and by early summer it is expected the total payroll will be 12,000. The new contract brings to \$46 million the Stratocruiser backlog at the Seattle plant, the others being 20 planes for Pan American and four for the Swedish International Airlines.

Aluminum Co. of America is reported to have purchased buildings and equipment at Edna Bay, Alaska, from the forest service, preparatory to exploring limestone deposits on Kosciusko Island. Drilling crews will be sent north shortly.

Kirsten Pipe Co., Seattle, originally organized to produce a metal tobacco pipe, has expanded its operations to include marine equipment such as steering engines, towing clamps and photo-electric

pilot. George Gunn Jr. is president. He announces that the company, which soon will move into a new plant, will take over a number of operations formerly handled by the Webster-Brinkley Co. Several staff engineers from that firm have recently joined Kirsten.

James E. Louttit, manager, industrial department, Seattle Chamber of Commerce, says reconversion in the Pacific Northwest has been more rapid than expected. Production, he says, is up to 40 per cent of prewar days, employment close to the prewar level; while by July 1 production is expected to reach 75 per cent of prewar figures.

"Although some materials still cannot be obtained," he added, "there has been much more activity than we anticipated, particularly in the past two weeks. Lack of steel has been the greatest difficulty and the pickup naturally has been slower among industries dependent upon steel in production. Aluminum is replacing steel in many instances. There is aluminum furniture, farm machinery and it is also used for window frames and radio tops."

December Manganese Ore Production Shows Decline

Manganese ore and manganese alloys in December were used in quantities varying from the prior month, the Bureau of Mines reports. A moderate increase in production of ferromanganese resulted in a 6 per cent rise in consumption of ore for metallurgical purposes while the small quantity of ore used in batteries and chemicals decreased 35 per cent and 13 per cent, respectively. Imports of manganese ore were 19 per cent less than during November but were 6 per cent in excess of consumption. Industry stocks of manganese ore on Dec. 31 were sufficient to last five months at the December consumption rate.

Domestic production of manganese ore containing (natural) 35 per cent or more manganese, in December was 11,000 net tons, shipments were 7600 tons and stocks at the end of the month were 5000 tons. In November production was 14,500 tons, shipments 13,200 tons and stocks at month end were 1600 tons.

Additional \$1 Billion Earmarked for Insuring Low-Cost Homes Under FHA

Subsidy provision of housing bill deleted over administration protest. Housing administrator given authority to direct OPA to make price adjustments to stimulate production of building materials

WHILE administration leaders suffered many disappointments in the housing bill as finally passed by the House, they are pleased with the provision earmarking an additional \$1 billion for insuring low-cost homes under the FIIA plan.

Believing that present building costs are due for a material reduction within six months to a year, lending institutions are unwilling in most cases to advance more than 60 per cent of the cost of building new homes. Without federal action this limitation would cut down the volume of home building substantially. With contractors and other builders able to get FHA insurance up to 80 to 90 per cent of the investment (the Senate is expected to concur in the House action), the financial hurdles largely will be cleared.

Would Authorize Price Revisions

While the House struck out the subsidy provision so ardently sought by the administration, it gave the housing administrator authority "regardless of any other legislation" to direct OPA to make price adjustments to stimulate production of building materials. If approved also by the Senate, this provision, plus the effects of the limitation order on use of building materials which the administrator now is readying, should ease the materials situation sharply in the near future. The limitation order will set up a code of deferrable construction which will be banned until a later date—probably until after Jan. 1. "It will not stop necessary railroad construction," says a spokesman, "but it will prevent building a railroad station. It will not prevent putting up new power lines, but it will prevent a utility company from building a new office structure." Exceptions to the order will be allowed only by special permission.

Administration leaders are pleased with the number of new housing projects started in recent months; these have been averaging around 30,000 new units monthly, which is unusual for the winter season. They hope the number of new starts will mount to 150,000—even to 200,000 monthly—during the summer months. The program which they now

contemplate as minimum provides for the start of work on at least 1,200,000 housing units from now till the end of the year. This would include 700,000 conventional type homes, 250,000 prefabricated homes, and 250,000 temporary homes to be built largely by re-use of material from dismantled wartime housing. A housing administration spokesman says that the prefabricated homes at the start will be almost entirely of wood and plywood construction, but encouragement will be given to an increasing use of steel and aluminum, steel particularly in the framework.

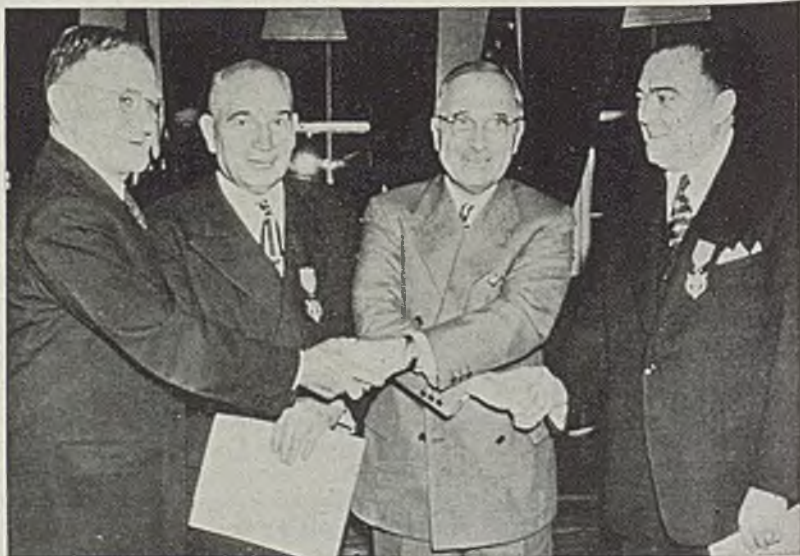
Housing authorities report that the shops of most prefabricators have been organized by AFL unions, and these interests propose to rely largely on union business agents to help clear away distribution barriers in the form of building code discriminations in the various cities. The prefabricators, incidentally, should be helped substantially by the OPA ruling under which plywood manufacturers may mark up prices on construction grades of this material by 20

per cent. The contribution of the prefabricators to the housing program should begin to become important around August or September, as it will take until then before some of the plants are properly tooled for production. A significant trend is the start of work on quite a few new prefabricating plants; one company alone is launching a program to build eight new prefabricating plants in various parts of the country.

Housing authorities believe that the limitation order postponing deferrable construction, even should the Senate refuse to go along with the House on giving the Housing Administrator authority over prices on building materials, will bring about a marked recession in building costs within two to three months following issuance of the order.

"Builders go to a lot of expense in sending out scouts to locate scarce building materials. Then they go to the expense of trucking these materials from distant locations. A Cleveland contractor recently hauled several truckloads of lumber from a point in the Pittsburgh district. A Chicago builder has been hauling a lot of lumber from Mississippi by truck. These costs will be eliminated when we iron out the materials bottlenecks," says a housing spokesman.

Federal housing officials also are devoting a good deal of study as to how to reduce costs by getting rid of many of the "featherbedding" practices which the unions instituted during the depression years of the 30s. This, they have



CIVILIANS HONORED: Medals of Merit were awarded by President Truman to these civilians for their work during the war. Left to right are: Col. J. Monroe Johnson, director, Defense Transportation; John J. Pelley, president, Association of American Railroads; Mr. Truman; J. Edgar Hoover, director, Federal Bureau of Investigation. NEA photo

FLEXIBILITY

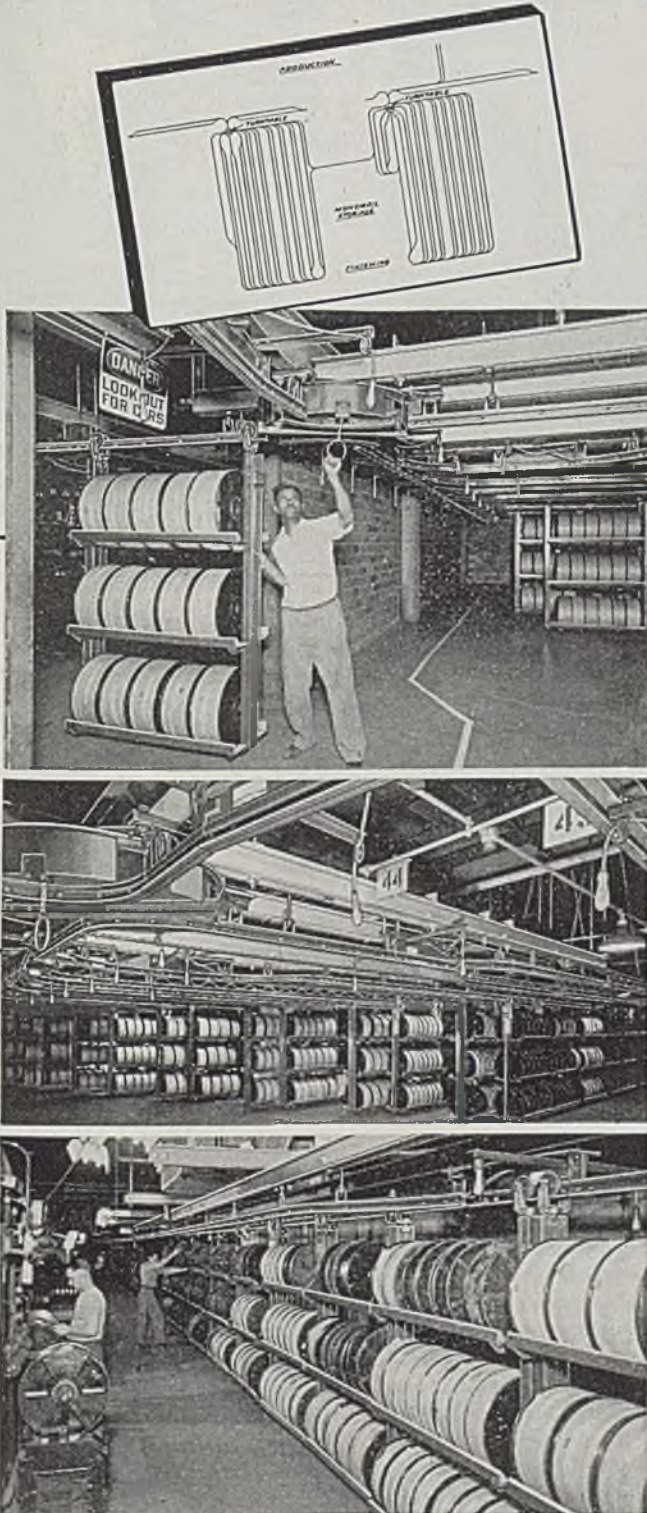
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concluded, is a job that will have to be done locally—not in Washington. They are preparing to organize a movement to set up committees all over the country—to be composed of representative citizens, officials of the building trades unions, and representatives from veterans' organizations. With proper steering from Washington, it is believed that when these committees come to realize how much "featherbedding" adds to the cost of housing construction they will get the desired co-operation from labor. One of the factors relied on to influence favorable action is the assurance that there is going to be full and steady employment for building trades workers for a long time to come—so that make-work rules need not be relied on to bolster up reduced earnings.

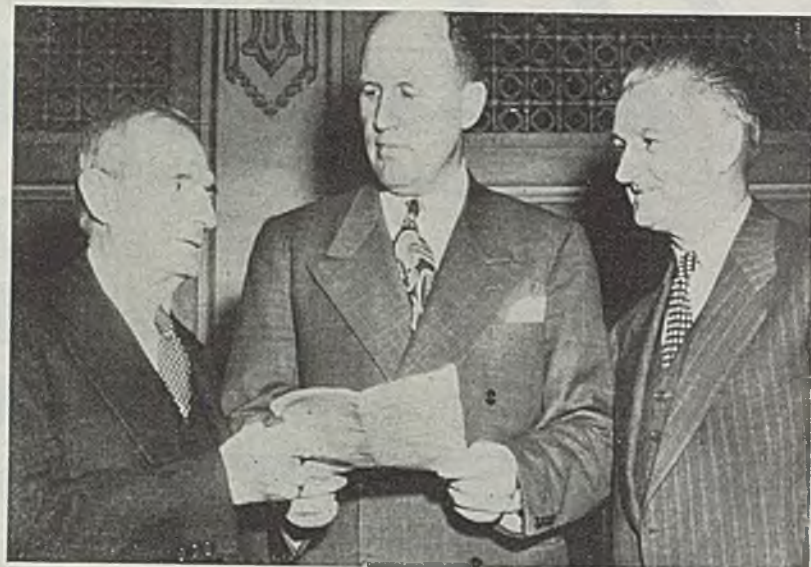
WORLD TRADE

Present plans call for convening the coming World Trade Conference late this fall instead of in the early summer as originally contemplated. One reason is the congressional delay in approving the British loan agreement of last December. But the principal reason is the expanding agenda for the meeting—at least insofar as activities to be initiated by the United States are concerned. The State Department is planning nothing less than the simultaneous negotiation of trade agreements with each of the other 15 nations to be represented at the conference; at the least it will lay the groundwork for subsequent conclusion of such agreements.

One big problem is that of policy in regard to foreign loans. The position of the Truman administration is that foreign loans should be handled by the International Bank—and according to information coming in from the conference now in progress at Savannah, Ga., the International Bank should be in shape to make such loans by the end of 1946, at least up to \$8 billion total.

The administration view is that the United States should make additional foreign loans only until such time as the International Bank gets going—and in the meantime should act only to take care of emergency rehabilitation needs. Loan applications now under tentative consideration by the Export-Import Bank include \$1 billion for Russia, perhaps \$500 million for France, and indefinite amounts for Saudi Arabia, Poland and perhaps other countries. The French loan would be in addition to the recent loan of \$500 million plus \$500 million credit on account of lend-lease.

Administration authorities are devoting intensive studies to what goods the



RAIL FACT-FINDERS: President Truman's railroad fact-finding panel are shown left to right: Frank M. Swacker, New York attorney; Leif Erickson, former Montana Supreme Court judge; Gordon S. Watkins, dean, economics department, University of California at Los Angeles. NEA photo

United States should agree to import in exchange for our exports. In particular, present ideas involve importation and stockpiling of foreign minerals on a large scale. The Commerce Department will be relied on to a large extent for setting up this program.

Administration spokesmen do not yet know the size of our export business over the coming year or two. They know that our shipments of food will be governed only by the quantities available for export; the situation has grown much worse lately by reason of droughts in the Mediterranean, India and Australia. Unless we have a drought here, we should have 12 million tons of wheat available for export, and perhaps the biggest problem will be where to send it so as to keep suffering at a minimum. We have a number of big deals under consideration, but financing details delay action.

The State Department is proceeding as actively as possible in pushing all lend-lease accounts to a conclusion, in order that such hangovers will not confuse the issues during the coming World Trade Conference. Basic policy is to cancel out all goods that were furnished under lend-lease and used up by the countries receiving them. On goods still usable the policy is to set realistic valuations; a lot of our surplus equipment is being sold at around 20 cents on the dollar, and being moved as fast as possible. Many of the problems present special difficulties, as making arrangements covering our fixed allocations on foreign soil. One of the puzzlers, for example, is what sort of a settlement to

make on the wrecked *Normandie*.

Administration leaders now are more hopeful that the Senate will approve the British loan agreement substantially as it was made. The Senate Foreign Relations Committee has been informed that the choice is one whether we will help Great Britain finance her imports until her exports catch up, or whether we will let her handle the problem without assistance—in which case we would encounter all possible barriers in our trade with countries in the sterling bloc. A number of senators who were distinctly hostile to the loan at the start have shown a more sympathetic attitude during the past week or two.

CONGRESS

The report of the LaFollette-Monroney committee may provide less foundation for the criticism that the Congress of the United States is the most poorly advised governmental body in the world. At present Congress has a research staff—the Legislative Reference Service—consisting of 75 persons and spending \$198,000 a year. This while Congress during the war years was appropriating in the neighborhood of \$100 billion annually. The LaFollette-Monroney committee recommends that the Legislative Reference Service at once expand its activities—to a scale of \$500,000 annually at first and to \$750,000 later. The committee also recommends a reduction in the number of standing committees of Congress, with an expansion of the number of experts serving those committees.

Manufacturers' Spokesman Urges Return of Control to Consumer

NAM's Wason calls OPA policies greatest handicap to all-out production, causes for continued shortages and gravest danger of inflation. Challenges assertion that prices would skyrocket if government ceilings were lifted

PRICE control by the consumer as a substitute for continuation of OPA regulation after June 30 was recommended last week by Robert R. Wason, president, Manning, Maxwell & Moore Inc., in his capacity as president, National Association of Manufacturers.

Without any reference to the recent attack on the NAM by Chester Bowles as a sponsor of an "irresponsible, reckless and greedy" lobby, Mr. Wason presented a long list of examples to show that "OPA is fostering inflation, enabling black markets to flourish, making it impossible for the public to buy low-cost goods, driving prices up and slowing down the peacetime production of goods."

His case was presented before the House Banking and Currency Committee which now is engaged in formulating a recommendation to the House as to what should be done about OPA now that the June 30 expiration date is in sight.

We earnestly ask Congress to endorse the only kind of price control that will assure that the right things get made in the right quantities, the kind of price control that has made America great, and the only kind that can keep America great—the kind of price control that compels producers to give the American housewife what she wants at a price that she thinks is fair, the price control of competition in free markets," declared Mr. Wason.

Inflation Warning Denounced

He denounced the OPA warning that prices would skyrocket if price controls on manufactured goods are removed before supply catches up with demand.

"Do you think women would stand in line to buy nylons at \$8 or \$10 a pair if they knew that next month they will be \$2? Do you think people would pay \$10,000 for an automobile if they are convinced that in three to six months they can buy the same car for \$1000? Do you think a store could sell a simple white shirt for \$10 if people know that in a matter of weeks they can buy all the shirts they want at \$1.95?" he asked.

It is the considered opinion of NAM

that today the greatest handicap to all-out production is the policies of OPA, said Mr. Wason. He presented a chart to show that it now takes \$1.39 to buy what could be bought for \$1 in 1939, adding that "this inflation does not include the rise of prices under the new wage-price formula; the rise in prices of meat, grain and clothing already announced by OPA; the higher prices the public is forced to pay because OPA policies have driven low-priced goods off the market, nor the inflation at present being hidden by government subsidies."

At the same time, added Mr. Wason, "this picture of existing inflation does not include the excessive prices being charged for the constantly increasing volume of goods sold in the black markets; OPA says that if Congress gave it 10,000 investigators it wouldn't have a chance of breaking up the black market in New York alone."

Lists Four OPA Hinderances

Emphasizing that he represents 15,000 manufacturers who produce 85 per cent of the manufactured goods of the country, and that if we are to get all-out production to stop inflation these companies will have to do the job, Mr. Wason summarized four reasons why, in the opinion of NAM, the OPA hinders production:

"1—With 3,000,000 businesses to regulate and 8,000,000 prices to set and police, it is not possible to prevent delays and confusion . . . with some prices too high, others too low.

"2—With some prices too high, others too low . . . production will remain out of balance, because producers will naturally concentrate on turning out those goods which are most profitable . . . And attempts to correct this unbalance by price adjustments will always create still more points of unbalance.

"3—Fixing prices on the basis of OPA's theoretical estimates of future production and costs . . . rather than established facts . . . will make production dependent upon the accuracy of OPA guesses, instead of upon the realities of the market place.

"4—Holding profits 25 per cent below

1936-39 and figuring profits upon net worth, instead of upon the volume of sales, destroys the incentive to try to get all-out production.

"Clearly, therefore, continuation of OPA means limited production . . . continued shortages . . . greater danger of inflation," Mr. Wason concluded.

ADVERTISING METHOD

When Chester Bowles took over the direction of OPA he introduced something new on the Washington scene. Making use of the lessons he had learned in the advertising business in New York about the effectiveness of striking graphs and short, pithy snappers in blown-up type, both specially designed for display on a stand with the aid of a pointer, Mr. Bowles dazzled various committees of Congress with his presentations as to what OPA had done and was doing for the country. His lectures, patterned after typical advertising sales presentations, had a lot to do with the fact that he has had much less trouble with Congress than his predecessors in OPA. Some of the members have been so impressed that they persuaded Mr. Bowles to supply them with thousands of copies of some of his charts for their constituents.

The path thus blazed by Mr. Bowles has been followed by numerous other witnesses eager to impress members of congressional committees with their arguments. Several businessmen appearing before the House Banking and Currency Committee in its current hearings on the continuance of OPA beyond June 30 have made use of striking graphs and blown-up type drawn up in poster effects. Most notable of these presentations was that of Robert R. Wason, president, National Association of Manufacturers, whose collection of graphs and posters was brought into the committee chamber on a hand truck. In addition to showing the large displays on a stand, Mr. Wason also distributed numerous copies of a 114-page book in which his graphs and snappers were reproduced on pages measuring 8½ x 11 inches. The book, too, was set in blown-up type, so that the messages on many of these pages consisted of 25 words or less. His presentation received close attention of the committee members.

Ceiling Price of 9.25c Set For Secondary Slab Zinc

A base ceiling price of 9.25 cents a pound, delivered at buyer's receiving point in carload lots, has been established for high-grade secondary slab zinc, effective as of March 20, the Office of Price Administration announced last week.

Steel Industry Improvements To Set Record

New high of \$327 million to be spent in 1946 for facilities, most of which will be rolling and finishing equipment

TO FILL postwar steel demands, steel producers plan to spend this year the record-breaking total of \$327 million for new equipment and additional facilities, the American Iron & Steel Institute, New York, reported last week.

Most of the expenditures scheduled for 1946 will be for new and improved rolling mills and finishing facilities. Because of the huge wartime expansion in blast furnace and steelmaking facilities, relatively little new construction is anticipated in those departments during the year. Instead, the bulk of the expenditures will go to buy new machinery and equipment for producing highly finished types of steel for civilian goods.

Included in the expenditures for 1946 are costs of several continuous mills for producing cold-rolled sheet and strip steel.

The industry's anticipated expenditure for new equipment in 1946 raises to \$2½ billion the total amount of money spent since 1935 by steel companies to expand and improve their plants. Half of that total was spent between 1940 and 1945 as the industry's share of the wartime expansion program. The other half, spent in peacetime years, represents the cost of the industry's continuous program of improving its extensive facilities for producing steel.

Anticipated new equipment expenditures for 1946 exceed by 10 per cent the peak reached in any year of the war and are more than double the amount actually spent in 1945.

At the beginning of 1945, steel companies estimated that during that year they would spend about \$200 million of their own funds to complete the wartime program of plant expansion. Ending of the war, however, made unnecessary the spending of the full amount. Actual expenditures in 1945 were \$148 million.

U. S. Steel's Output of Alloys Rose 320% for War

United States Steel Corp. increased its alloy steel output by 320 per cent during the war, and special steels were de-



PLAN MOTOR JUBILEE: Members of the initiating and working committee for Detroit's Golden Jubilee to be held in late May and early June in commemoration of the 50th anniversary of the motor car industry. Left to right are: George W. Stark, president, Detroit Historical Commission; D. P. Connery, United Automobile Workers-CIO; William H. McGaughey, public relations director for the Automobile Manufacturers Association; Edward M. Swan, regional director of the Fair Employment Practices Commission; Charles Boyd, executive secretary of the Detroit Retail Merchants Association; George Romney, general manager, Automobile Manufacturers Association; Morton Zimmerman, Wayman, Wayne County Federation of Labor

veloped which for practical purposes became "new steels." This is revealed in a new book, "Steel in the War," which has just been published by the corporation.

The American steel industry increased its annual production 70 per cent over 1939, and produced a total of 467 million tons of steel in five years, ending July 31, 1945. U. S. Steel's share of that amount was 161 million tons, which was more than that produced by any other American steel company. U. S. Steel's share of total American steel production, however, remained about the same.

Irving S. Olds, chairman of the board, declared in a foreword to the book that for every dollar of government money U. S. Steel spent for war emergency expansion, it used 65 cents of its own funds.

Mr. Olds said that the industrial output of the nation, which amounted to more than \$186 billion worth of ships, planes, guns and other material during the war, was made possible by the "incredible rapidity that our industry changed from a peace footing to a mighty arsenal."

He asserted that without the expan-

sion and modernization program of his corporation during even the period from 1929 to 1940, at a cost of about \$600 million, the nation's war program would have been handicapped, particularly after Pearl Harbor when shipyards, aircraft plants and the manufacturers of guns, shells, tanks and trucks were clamoring for steel.

Two Republic Steel Plants Win Safety Council's Award

In recognition of outstanding achievement in industrial safety, the Massillon (O.) plant, Central Alloy District, and the Cleveland plant, Steel & Tubes Division, Republic Steel Corp., have been awarded the National Safety Council's Distinguished Service to Safety award.

The award is based on attainment of an unbroken period of more than 1 million man hours worked without a lost-time accident. The Massillon plant achieved this record between Aug. 29 and Oct. 29 last year with a total of 1,045,391 man hours worked. The Cleveland plant received the award for having attained, as of Jan. 15, 1946, a total of 1,442,667 man hours worked without a lost-time accident. This total

had been increased to over 1,568,000 man hours by Mar. 1, and the plant had passed its 457th day without a lost-time accident.

**Carnegie-Illinois Licenses
Scotch Firm on Cor-Ten**

Carnegie-Illinois Steel Corp., Chicago, has announced that Colvilles Ltd., Glasgow, Scotland, has been licensed to manufacture Cor-Ten, corrosion-resistant, high-strength, low-alloy steel developed by Carnegie - Illinois. Until fall, 1944, when Lukens Steel Co., Coatesville, Pa., and Republic Steel Corp., Cleveland, were licensed to manufacture the material, it had been produced solely by United States Steel Corp. subsidiaries. More recently, Crucible Steel Co. of America, New York, has become a licensee.

The material is being widely used in the manufacture of railroad freight cars and light-weight passenger equipment as well as in mine cars, trucks and busses.

**Bell Aircraft Given First
Private Helicopter Order**

Confirming the first commercial helicopter order ever to be placed, Bell Aircraft Corp., Buffalo, has announced the order was placed by a large drug company. This and several other commercial orders have been placed since the Civil Aeronautics Board awarded Bell the No. 1 helicopter airworthiness certificate recently.

The order is for the new two-place machine, 500 of which will be built. The price is reported to be around \$25,000.

The company has plans to produce several models of helicopters, among them a four-place type.

**Engineering Society Seeks
Technical Book Donations**

A nation-wide campaign looking toward restoration of engineering libraries in war-devastated areas overseas was announced recently by the American Society of Mechanical Engineers, through its Committee on International Relations. An appeal was issued to engineers throughout the country to assist with gifts of technical books and periodicals to replace those lost or destroyed. Donations of money will be used to buy new books for foreign technical libraries.

Engineers having books to give are asked to send a list at once to George A. Stetson, Editor, the American Society of Mechanical Engineers, 29 West 39th St., New York 18.

BRIEFS

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

National Radiator Co., Johnstown, Pa., has purchased from Pullman Co., Chicago, the Middletown West End Car Shops, Middletown, Pa., and will operate it as a fabricating plant.

Colonial Smelting & Refining Co., Columbia, Pa., newly organized, has purchased Columbia Malleable Casting Corp., that city, and will smelt and refine nonferrous metals, bronze, brass and aluminum ingots.

Harvey Metal Furniture Co., Baltimore, has begun the manufacture of aluminum furniture at 714 Lemmon St., that city.

Ellinan Steel Co., Detroit, has moved to 2700 West Warren Ave., Detroit 8.

Jefferson & Co., Huntington, Ind., has moved to 1014 Main St., Rochester, Ind.

World Trade Inc., Chicago, has been organized to carry on export-import trade in metals, building materials, plumbing supplies, household appliances, etc. The company is located at First National Bank Bldg., Chicago, and is headed by Lt. Col. J. Albert Roesch, president, and John H. Crosby, vice president.

Liquefied Petroleum Gas Association, New York, has moved its national headquarters to 11 South LaSalle St., Chicago, and is represented by Howard D. White, newly appointed executive vice president.

Bethlehem Steel Co., Bethlehem, Pa., has acquired from the Maritime Commission the materials, equipment and facilities of the former Bethlehem-Fairfield Shipyard Inc., Fairfield, Md.

Heppenstall Co., Pittsburgh, has announced production of a new prehardened die steel, Silver Hardtem. The material is available in the form of die blocks and die block bars and inserts.

Louis Berkman Co., Steubenville, O., shop equipment and mill supply jobber, has purchased the assets of Parkersburg Iron & Steel Co., Parkersburg, W. Va., nonintegrated sheet producer.

Westinghouse Electric Corp., Pittsburgh, has developed a family of transformers for electronic heating units ranging in size from 2 to 50 kva single phase and from 2 to 100 kva three phase. They

are air cooled and can be insulated for test voltages as high as 20,000 volts.

Buffalo Bolt Co., North Tonawanda, N. Y., has formed a subsidiary to handle all overseas sales. The company, Buffalo International Corp., is located at 50 Church St., New York.

Cincinnati Planer Co., Cincinnati, has been acquired by a group including Sidney G. Rose, Philip L. and Ben Moskowitz.

Hungerford Plastics Corp., Murray Hill, N. J., has been formed to provide a complete thermoplastic service, including product and mold design, mold manufacture, material compounding and facilities for injection and extrusion molding.

Edgar T. Ward's Sons Co., Pittsburgh, steel distributor, has opened a warehouse at 809 North Ave., Dayton, O.

Kennametal Inc., Latrobe, Pa., has opened a branch sales and service office at 538 North Erie St., Toledo, O.

Peninsular Grinding Wheel Co., Detroit, has made available a series of twelve safety posters drawn by J. R. Williams, creator of "The Bull of the Woods." These posters promoting safety in grinding wheel operations are being offered to industry without charge.

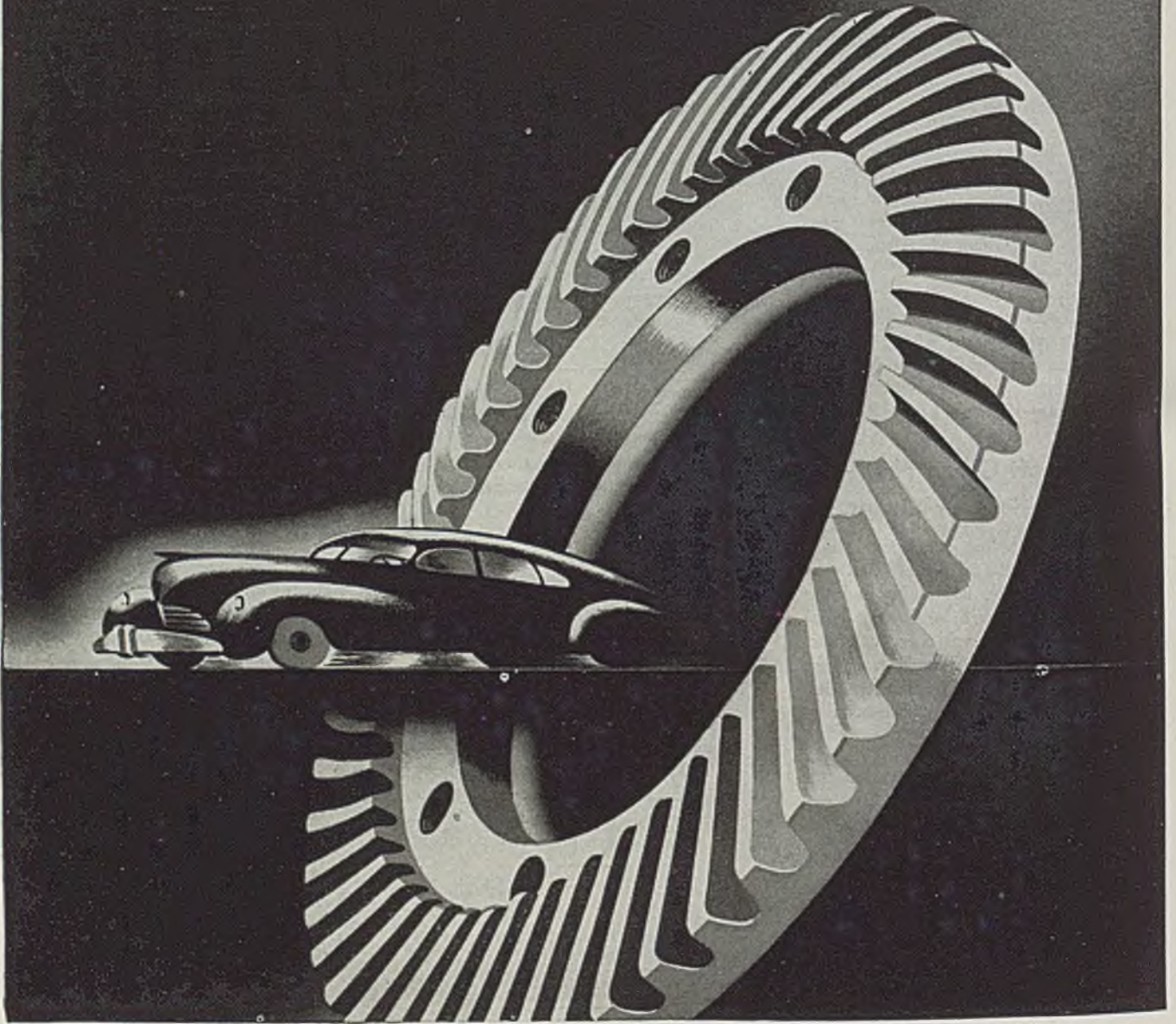
Simplicity Mfg. Co., Port Washington, Wis., implement and grinder manufacturer, has expanded its operations by adding a new plant unit and is currently celebrating its 25th anniversary.

Pennsylvania Railroad, Philadelphia, has announced celebration plans for April 13 to commemorate the 100th anniversary of the signing of its charter by the State of Pennsylvania.

National Bureau of Standards, Department of Commerce, Washington, has submitted a proposed simplified practice recommendation for open end and box wrenches to producers, distributors and users.

In the Mar. 18 issue of STEEL, p. 97, the name of Reliable Spring & Wire Forms Co., Cleveland, was incorrectly given as Reliance Spring & Wire Forms Co.

Molybdenum in steel is an answer to impact requirements—hardenability is improved and temper brittleness practically eliminated.



MOLYBDIC OXIDE—BRIQUETTED OR CANNED • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"
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Disputes on local issues slow return of General Motors workers. Wallace backs water on Department of Commerce report that auto industry could increase wages by 25 per cent in two years without increasing prices

DETROIT

ALTHOUGH the UAW-CIO was claiming as early as last Tuesday its new contract with General Motors was ratified by a majority of the membership, a number of extenuating circumstances stand in the way of resuming full-scale production. First is the fact a number of the union locals, while approving the national agreement, are refusing to return to work pending settlement of local differences. These include such things as abandonment of piecework systems or incentive pay plans down to complaints of abusive language by foremen.

The vast majority of GM working people want to go back, they have wanted to for weeks, but the vociferous and rebellious minority at the top of a local often is successful in preventing the will of the majority from governing action. Reports of votes held by a few of the 91 locals indicate in several cases these hot-headed leaders have been shouted down, in other instances those casting ballots numbered only 15-25 per cent of the total plant working force (at Buick, for example), thus it was not surprising the corporation informed the union following the voting that as long as any divisions remained on strike by virtue of local action, no production men would be recalled at any plant. A key factor is the interdependence of parts and assembly plants of course, which the union recognizes fully.

Contract Brings Compensation Demands

One reason for the union's rush to proclaim ratification of the agreement is the supposition idle workers will be entitled to unemployment compensation payments at that juncture. In fact, a UAW attorney gave the opinion such payments should be started as of the date of the signing of the agreement by the corporation and the International. Unquestionably the resources of a heavy percentage of GM workers were being stretched beyond their elastic limit and it will be at least a week after start of work before wage payments resume, so the problem of immediate and extra cash is pressing.

The UAW was able to solicit around \$600,000 in donations, including two of \$100,000 each from other CIO units, the Clothing Workers and the Steelworkers, but spread this over 175,000 strikers and there is about \$3.50 each, or the price of one day's food.

Many problems are confronting GM plant managers, in addition to negotiating remaining differences with unions. In the first place, a considerable but still undetermined number of men probably have taken other jobs, or started their own businesses. The unfortunate part is that this group represents a high-grade strata of labor, since in a long strike, the able and resourceful employees are the first to step out and figure some way to maintain a living, while the dullards and perpetual grievance-bleaters sit around and do nothing.

In the second place, it is believed ill feelings between those who supported

the strike and those who wanted to return to work will persist for a long time. One group charges the other with unnecessarily prolonging the tieup, while the other charges its opponents with disloyalty to the union. Contention of this sort is not settled by ratification of an agreement which brings no gains not enjoyed by other automobile workers who have not endured a withering strike.

Furthermore, there still remains the unanswered matter of productivity, and some supervisory forces must feel little has been gained in the new contract which avoids any mention of company security in the form of guarantees of unrestricted output and an end to wildcat strikes.

These are some of the pessimistic factors. On the credit side, it must be recognized GM, by sticking to its principles, won out against union attempts to usurp management functions and to dictate production and price policies. This alone may have been worth the fight, not only for GM but for other industries as well. As far as the tools and the materials of production are concerned, the position of the corporation is most comfortable,



SPEEDS PAINT DRYING: An assembly line installation of infra-red ovens that reduces the time of paint touchup processes by two-thirds has just been revealed by Studebaker Corp., South Bend, Ind. The 32-foot ovens, each containing 800 lamps on 20 different parallel circuits, are operated to dry primer coats of paint. Enamel is then applied and the surface baked in a conventional steam tunnel oven

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AMMUNITION FOR FOOD BATTLE: Where bomber parts were stored during the war, these parts for agricultural machinery are inventoried at Willow Run. They are handlebar bases for the Graham-Paige Rototiller farm machine which prepares ground for planting in a single operation

and a quick return to profitable operating levels is dependent only upon adjustment of labor strains. Up to the time of the strike, passenger car assemblies had totaled 24,468 in the five divisions—2481 at Buick, 1205 at Cadillac, 12,776 at Chevrolet, 3956 at Oldsmobile and 4050 at Pontiac.

Of the five, Oldsmobile should be the first to return to normal, thanks to an unusual agreement with the union local which permitted a force of around 800 to re-enter the plant some ten days before the strike was settled to undertake preparatory work which would facilitate a quick start on car assemblies.

Looking back to the early days of the GM strike and negotiations preceding it, a controversial issue was a report issued by the Department of Commerce and apparently endorsed by Secretary Wallace purporting to show the automotive industry could pay 15 per cent higher wages in 1946 and another 10 per cent in 1947, and, without raising prices, still realize greater than prewar profits. The report was transmitted to John Snyder of the OWMR, forming the basis of an extensive memorandum from this agency in the same tenor. It was also forwarded to the President who doubtless used it as the basis for his subsequent wage-price recommendations. It was vigorously protested by industry spokesmen who called upon the secretary for the supporting data used in fashioning the report. No

such data ever were forthcoming, the OWMR memorandum basing its contentions on such nebulous factors as reduction of overtime, downgrading and repeal of corporation excess profits taxes. All of these were thoroughly discredited in a brief issued by General Motors on Nov. 7.

As recently as March 1, the automobile industry asked Secretary Wallace again to correct public misunderstanding caused by his November analysis, and finally, four months after the harm had been done, the secretary issued a statement saying the calculations were only "an initial effort to develop statistical methods and technics to determine and project cost, price and profit relationships under varying assumptions as to volume of production and sales." Acknowledging inherent uncertainties in such projections, he added, "they were not intended, nor should they have been regarded, as official forecasts of costs, prices or profits for the automobile industry or for industry as a whole."

The entire analysis was the work of one Harold Wein of the Department of Justice who batted it out in his spare time and turned it over to the Commerce Department for editing and release. At best the material was only pseudo-scientific. The coincidence of its timing is too remarkable to have been anything but deliberate, and the report seems to have accomplished its nefarious purpose. Its

cost to the country will be staggering, and industry will await with interest the next "release" from the Commerce Department on its \$2 million appropriation for this sort of thing.

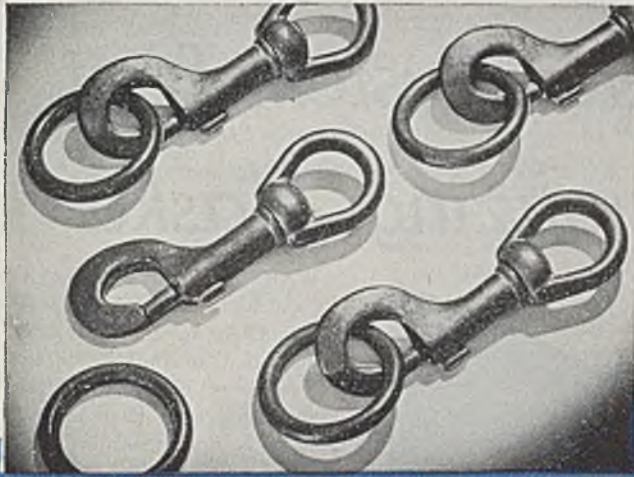
Removal of OPA ceiling prices on all parts going into truck manufacture as original equipment, with the exception of tires, batteries, radios and steel castings, dislodges a barrier which has become frightening to truck manufacturers who found their suppliers refusing to accept business under the old price schedule. The OPA said the change was made to relieve the great burden placed on its clerical staff, and this is probably as good an official reason as any. Retention of ceilings on truck parts which had been removed last fall from passenger car parts made little sense. Even now, ceilings still are in force on parts made for service and replacement purposes, which means that about the only way manufacturers can now furnish service parts is to buy them as original equipment, mark the price down to the ceiling level, and absorb the resultant loss.

Dealers Face Another Cut

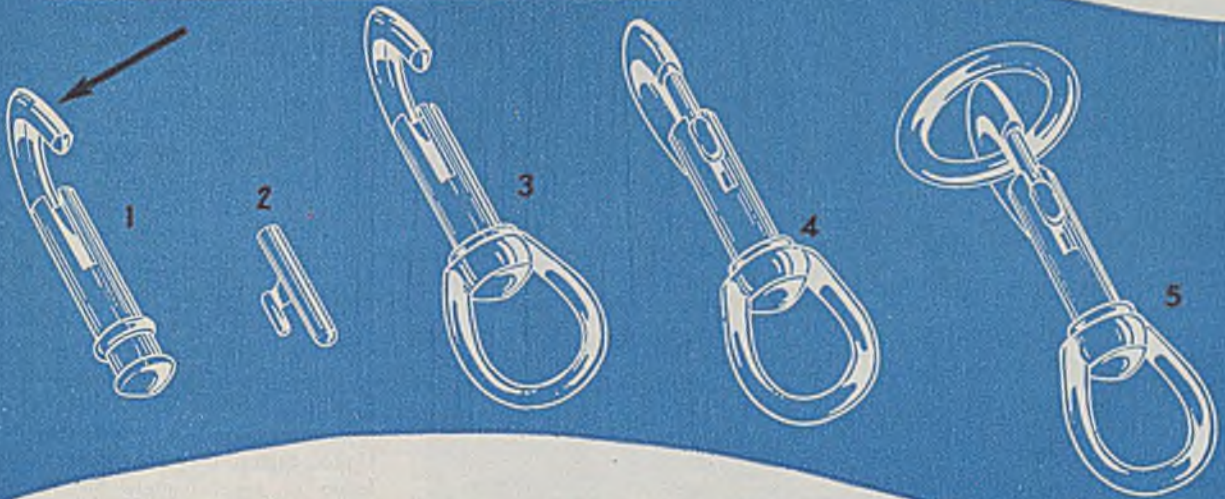
The OPA has stepped into more boiling water by informing automobile dealers they will be expected to absorb another 2 per cent in their discounts as a result of a proposed 2.6 per cent increase to be allowed manufacturers to cover increases in wages. The price agency called a dealer advisory committee meeting on four-day notice and caught representatives flat-footed. The current increase is said not to reflect further increases which might be caused by higher steel prices, higher parts prices and the like, and there is no guarantee dealers will not be asked to absorb further price adjustments. The National Automobile Dealers Association says it is determined to do everything possible to prevent this "grossly unfair action" and "will fight to the last ditch with every means it can muster."

This is just another inevitable result of government efforts to force wage and cost increases to be absorbed out of pre-empted profits. Admittedly it will not work, but the only recourse left for Washington is to ask Economic Stabilizer Bowles to prepare another castigation of those "greedy and irresponsible interests."

Revision of Ford plans to introduce 1947 models this fall has been confirmed by J. R. Davis, sales manager, who said specifically, "It would be unfair to the public to shut down our plants the several weeks needed for model changes this fall. It probably will be sometime after the first of the year before we discontinue 1946 models." Mr. Davis indicated similar statements may be expected from other producers.



DESIGNING FOR DIE CASTING



BENDING AND FORMING

In designing die castings, take advantage of the ductility of zinc alloys by bending or forming after casting. This ductility makes it possible to shape integral flanges to curving contours, to bend hollow arms, to spin out undercuts, to upset odd projections or to twist parts of the casting through 90° or more.

The step-by-step drawing above illustrates how the ductility of zinc die casting alloys was employed to good advantage in the production of a hal-yard snap hook. (1) The hook is cast with a bent angle (see arrow) to permit coring of the slotted shank and the

subsequent insertion of a die cast bolt (2). The shank end of the hook is then placed in a die and the swivel is cast around it* (3). After insertion of the bolt and a spring, the hook is heated and then straightened (4) in a punch press. A die cast ring completes the assembly (5).

Additional data on bending and forming 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 copy of this booklet.

*A special spacer coating on the shank is removed in a tumbling machine after the swivel is cast around it. The shank is then free to rotate in the swivel. The manufacturer of this assembly has applied for a patent on this method of fastening.



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Basic Transportation System First Need For Industrializing Alaska

WARTIME plans to industrialize Alaska and build up a large population there are unlikely to come to early fruition. While that territory is incredibly rich in resources of many different kinds, many things will have to be done before it is ripe for full exploitation. In the meantime, Alaska's economy will grow, and many businessmen will find opportunity there. But, unless the nation takes the situation in hand and removes the many hindrances to expansion of Alaska's economy, and does a big job at the expense of the taxpayers in general, it will be many years before Alaska has the population and rounded-out industries considered essential to making that area an adequate defense bastion in the north Pacific.

These are the principal conclusions in a House Territories Committee report on a trip which 13 of its members made to Alaska last summer. Alaska, with an area approximately one-fifth that of the United States, they found, has a population of approximately 80,000, about 45 per cent of which is composed of native Indians, Aleuts, and Eskimos. The white residents, although of good American stock, number only 36,000. Not only are they scattered thinly over immense

Built as a wartime measure, the Alcan highway may help in the development of Alaska. At left above, Army trucks are hauling supplies to northern outposts

Pipe for the line from Whitehorse, Yukon, to Norman Wells, subarctic oil field, moves north on the Alcan highway

80

Rail, water and highway facilities, co-ordinated with air transportation, essential to development of northern territory. War-time plans to build up large population unlikely to come to early fruition, but considerable opportunity is offered for business

distances, but it is exceedingly difficult to get from one place to another.

"The first and foremost need in Alaska is a basic transportation system, to include rail, highway and water transportation facilities, and these should be co-ordinated with air transportation," says the report. "In order for such facilities to be of great value in developing Alaska they must offer rates low enough to make such facilities available to persons of moderate means. With this basic need supplied, Alaska's population and conditions generally within the territory should take on a normal, healthy and continuing growth. Other improvements and developments would then naturally follow in sequence. The lack of such a system now effectively precludes economic utilization of many of the territory's resources and the establishing of an industrial basis for a larger population which is needed for the realization of a sound economy and a well-rounded social and political development."

The committee found a most discouraging transportation situation. Because southeastern Alaska consists mostly of islands and a narrow strip of seacoast backed by difficult mountain chains, the most important single element of transportation in that vital area is the coastal steamship service "which at the present time is inadequate, irregular and excessively costly both for passengers and

freight. This is likewise true of the steamship service between the United States and southeastern Alaska and between southeastern Alaska and the main body of Alaska."

Furthermore, says the report, "the only regularly scheduled steamship service in southeastern Alaska at present is by foreign vessels which operate primarily to serve foreign interests and which give only secondary or incidental service to American interests. It was necessary for the committee to travel on such foreign vessels in going to Alaska. Every American using this service has to clear through foreign customs, and again clear through American customs before entering Alaska or before again entering the States. This is a very distasteful barrier to proper relations, and one that should be overcome or removed."

The government-owned railroad in Alaska is a fine property but it has only about 500 miles of track, and operates at an extremely high level of rates and fares. There are some fine gravel highways but they provide access to very limited areas. The Haines cut-off from southeastern Alaska through Canada to Fairbanks was built for military purposes and now is closed. The Alaska Highway to Dawson Creek, Canada, on which we spent \$100 million so far has been open only to military travel. If these roads are opened to civilians, and are

Railway transportation meets unusual difficulties in Alaska, due to weather conditions and to the steep grades. Three engines are used to haul a load up the slopes of Skagway on the White Pass & Yukon line. Shot at left below was made 14 miles north of Skagway

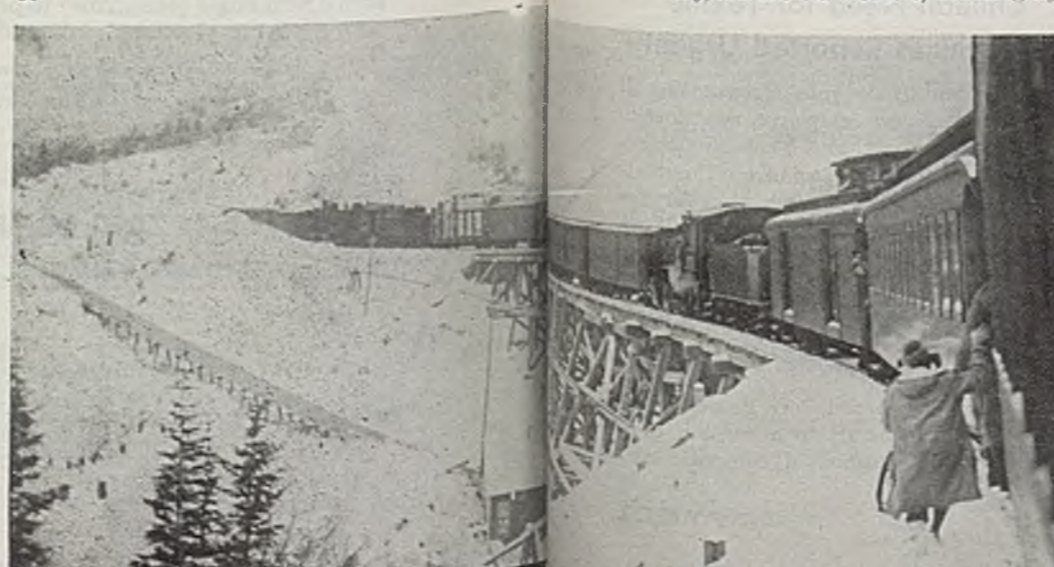
Modern transportation in the form of heavy trucks has invaded the Yukon territory, but the old means of traveling by dog sled still is in use. NEA photos

supplemented by regular, adequate and economical steamship service between Seattle and various Alaskan ports, the foundation will have been laid for industrializing Alaska and increasing its population.

Air transportation is widely used in Alaska but is very expensive. "At present but one air line is operating and the fares are about three times those in the States." The report recommends that the Civil Aeronautics Administration study this situation and bring about a reduction in rates through stimulating competition in air transport. In this connection the report makes mention of the great importance of Alaskan airfields in connection with air transportation to Siberia and Russia. It also bears in mind the importance of airfields and commercial airlines in rounding out the usefulness of our military bases in Alaska. The report recommends that the telephone system which we constructed alongside the military highway from Dawson Creek to Fairbanks be made available for civilian use. Also, the oil pipeline along this road should be made available to civilian needs.

While we have only scratched the surface in the programs of exploration conducted by the Bureau of Mines and the Geological Survey, the presence of important mineral deposits has been uncovered. "Among the important mineral products of Alaska are coal, copper, silver, lead, platinum, zinc, mercury, antimony, chromite, oil and tin." Gold mining still is the second industry in the territory. The great new future of Alaska, the report says, may be in oil. The Navy is actively investigating petroleum reserve No. 4, some 35,000 square miles at the northwest tip of the continent. A large oil company is about to embark on a big-scale exploratory program in Alaska.

The No. 1 industry continues to be fishing and fish processing, and salmon now is canned in over 100 separate plants. In addition to salmon and hali-



but, whose pack can be increased without depleting the supply, there are many varieties of valuable food fish in Alaskan waters which so far have not been fished commercially. Better utilization of the waste products of the fishing industry, now mostly discarded, is on the threshold. "One reduction plant now operates at Ketchikan on the waste products of the several salmon canneries located there, producing fish oil and fertilizer. Other such plants should be opened to prevent the present great waste of valuable products."

Alaska has enormous reserves of high-grade timber and there are now several modern sawmills in operation. This is an industry susceptible of great expansion if a solution is provided to the present problem of high transportation costs. In addition to the timber, there are extensive water power resources to support diversified activities in the timber areas. "The most promising early large-scale development," says the report, "is expected to be the establishment of a pulp and paper industry. It is estimated that the forests of Alaska can supply, on a sustained basis, approximately one-fourth of the total national requirements for newsprint."

Third most valuable industry in Alaska continues to be fur production and this is growing rapidly as trapping is augmented by fur farming. Not only is the climate ideal for this purpose but food for the animals, particularly fish products, is inexpensive. The University of Alaska has under way an experimental program to promote this industry.

Alaska To Be Important Playground

The committee—provided that present transportation difficulties are solved, and transportation be made available on regular and adequate schedules, and at reasonable rates—sees Alaska as one of our important future playgrounds. The scenic grandeur, and the fine hunting and fishing, combine with the invigorating summer climate to provide attractions to increasing thousands. The report predicts a big increase in the number of hotels and lodges in the territory, with an accompanying expansion in many service lines of business. The report makes clear that whereas much of the food utilized in Alaska is imported from the United States, there is a large acreage of potential fertile farm land with a growing and harvest season of well over 100 days.

The committee concludes with the opinion that "important gains in population can be expected in the years immediately ahead," and that the federal government should take an active part in the economic development of Alaska. But it finds that many of the factors need care-

ful study. "We hope to work with the citizens of Alaska in a continuing effort to recommend and enact legislation which is in the best interests of the territory and which will aid opening up and developing this great section of our country."

Alaskan Delegate E. L. Bartlett, who made the trip with the House Committee on Territories, told STEEL that businessmen and manufacturers who contemplate going into business in Alaska should read the new book, "Opportunity in Alaska," written by George Sundborg, and published by The Macmillan Co., New York. This book, said Mr. Bartlett, gives an accurate picture of the needs in the territory for such establishments as ship repair yards, and small boat building and repair plants, and miscellaneous repair and maintenance shops.

Still available to businessmen who want to know about opportunities in Alaska is the booklet entitled "Small Business Possibilities in Alaska." Copies may be had from the Government Printing Office. This contains a report by Maury Maverick, then head of the Smaller War Plants Corp., following a trip to the territory. Mr. Maverick listed the following plants as among Alaska's needs:

Sawmills, shingle mills, creosoting plants, machine shops, sheet metal shops, foundries, forge shops, small boat plants, concrete products plants, brick and clay products plants, chemical plants, warehousing and cold storage plants, quick-freeze lockers, boat yards and marine railways, also restaurants and a host of other service establishments.

Panama Plans Electrical, Radio Station Additions

Panama is making comprehensive plans for installing modern electric and radio equipment in the immediate future, according to reports from that country by American official observers.

Equipment for a new radio station already has arrived at Panama City, it is stated, and awaits only completion of the building for housing the transmitter and control equipment.

Modern apparatus, electrically operated, will replace the present system of acetylene lighthouses along both the Atlantic and Pacific coasts in Panama, it is further stated. An unusual feature of the program is the plan for running the lighting system by batteries controlled by solar relay, which will shut off the light when the rays of the sun strike the lighthouse.

The plan for a modern electric power plant to cost \$1,200,000 to furnish elec-

tric current to suburban areas of Panama City, calls for its installation this year. Equipment and parts are to arrive in Panama in September, but construction of building will be launched in June, so that the plant, with two 2000 kw units, is expected to be ready for operation by the end of the year.

Report Shows Brazil's Iron And Steel Imports from U.S.

Iron and steel imports into Brazil from the United States during the first nine months of 1945, with total imports in parentheses, included: Iron bars and rods, 3143 metric tons (3144 metric tons); iron strips, 821 tons (841 tons); iron sheets and plates, 8756 tons (8759 tons); steel bars and rods, 21,332 tons (22,001 tons).

Steel strips, 6946 tons (7107 tons); steel sheets and plates, 29,173 tons (29,414 tons); angles and tees, 6613 tons (8624 tons); tin plate sheets, 42,124 tons (42,124 tons); rails, light and heavy, 66,305 tons (67,707 tons).

Total value of the items imported from the United States during the period was 442,278,000 cruzeiros, and total imports were reported to be valued at 460,918,000 cruzeiros.

Plans Hydroelectric Power Project in Brazilian River

Brazilian authorities are making plans to parallel the Tennessee Valley Authority development in the United States in their Sao Francisco river of Brazil, at the Paulo Alfonso Falls.

The potential hydroelectric energy there, it is estimated, is 608,000 horsepower, or 448,000 kilowatts, which can be made available to Brazilian industries in the northeastern part of the country, and will open a vast irrigation possibility.

Chilean Need for Textile Machines Reported Urgent

Chilean textile mills are virtually all in need of new equipment, according to a survey reported to this country through the Department of Commerce. The shortage is said to be responsible for the country's inability to meet its textile requirements.

Two Ecuador Cities To Get Automatic Phone Systems

The government of Ecuador has awarded a contract to a Swedish company for installation of automatic tele-



STRIPPED FACTORY: General view of large rubber factory at Mukden, Manchuria, after being stripped by the Russians. Holes were blasted in the walls in order to remove all usable machinery. NEA photo

phone systems in Quito and Guayaquil, according to a report to the United States.

Each city will have an initial installation of 90,000 lines, with capacity for a substantial increase when required. The program will require about two years for completion, it is stated.

Brazil May Obtain Textile Plant Equipment in U. S.

Brazilian interests are reported to be considering the possibility of importing equipment from the United States for textile factories now contemplated in the country.

The program envisioned includes five or possibly six plants to be constructed over a 10-year period, work on the first to begin this year. Each factory is to contain up to 10,000 spindles, and the necessary washing and scouring equipment.

Pipe and Bolt Threading Machines Wanted in Brazil

Brazil offers a market for various pipe and bolt threading machines, die stocks, etc., according to reports by American official observers from Rio de Janeiro.

The yearly market includes 50 pipe and bolt threading machines, 1000 units of die stocks, 50 to 70 machine parts for screw machines, with a preference reported for tubular type threading dies. The country has one producer of pipe

and bolt threader machines, with an output estimated at 30 machines per year.

New Zealand Reports U.S. Electrical Goods Shipments

New Zealand imports of electrical goods from the United States had a value of £771,003, New Zealand currency, in the first ten months of 1945, according to an American trade survey just reported. Imports include the following: Wireless apparatus, £194,083; electrical apparatus, £523,914; insulated cable and wire, £53,006.

Number of French Vehicles Declines Over 50 Per Cent

The 1,850,000 motor vehicles in France in 1938 have been reduced over 50 per cent, according to foreign press reports which estimate the number of private cars in January, 1946, at 380,000 (compared with 1,400,000 before the war) and the number of trucks and vans at 230,000 (compared with the prewar 430,000), according to a report to the Department of Commerce. Plans for 1946 include production of some 116,550 vehicles, including 73,000 cars to carry freight, for which about 314,000 metric tons of ferrous metals will be required.

Forty types of cars will be manufactured instead of the 136 types made in the prewar period, and manufacture

will be organized into seven groups, each specializing in a few types.

In addition to purchases of allied military vehicles and the transfer of a number of motor vehicles from Germany, orders have been placed in North America for about 45,000 motor vehicles.

Easily-Machined Conical Ingots Used by Germans

A novel feature of steelmaking practice observed by a United States investigator at the Deutsche Edelstahlwerke, German steel mill, is the casting of truncated conical ingots. The Germans claim that making cone-shaped ingots facilitates subsequent machine turning and eliminates the chipping and grinding operations usually necessary on billets rolled from ingots.

Annealing is required for ingots that are to be machine turned. For this purpose, the Edelstahlwerke uses a long, continuous, gas-fired, car bottom annealing furnace. A battery of lathes for rough turning the ingots also is required.

New Tractor Is Reported Developed in Russia

Development of a new tractor combining some of the advantages of the tank, the auto and the tractor, is reported from abroad, based on Russian reports.

The new apparatus is described as having a load capacity of two tons, a tractive force of 8 tons, and a maximum speed on good roads of 37 kilometers. The tractor is said to be a product of a Soviet plant that turned out self-propelled guns during the war.

British Textile Machinery Firms' Deliveries Reported

Deliveries by British firms manufacturing textile machinery totaled £681,000 in the last half of 1945. More than half of this total was for export, according to a report on the progress of reconversion in that country received recently in Washington.

Farm Machinery Imports In Ireland Reported

Irish imports of agricultural machinery for the first ten months of 1945 totaled £396,098, according to American sources in Dublin. Imports include 367 complete agricultural machines and 282 tractors in October; and for the ten-month period, 3485 agricultural machines and 981 tractors.

MEN of industry

Samuel C. Avallone, who joined the Spencer Wire Co., West Brookfield, Mass., as a sales engineer on fine wire specialties in 1944, recently was promoted to general manager of sales and chief metallurgist of the company.

J. Adams Holbrook recently was named to the staff of Morgan Construction Co., Worcester, Mass. Mr. Holbrook is a graduate of Worcester Polytechnic Institute, and since graduating in 1939 has served as an instructor in that school's Washburn shops.

W. A. Haven, vice president, K. A. Barron and E. H. Collister, Arthur G. McKee & Co., Cleveland, are en route to China where they will serve in a consulting capacity for the National Resources Commission of China for the next few months. W. C. Buell Jr. and J. H. Bodie, also of the McKee company, have left for India to be gone for 6 to 8 months.

S. R. Hiner Sr. has succeeded Leonard Gerhardt as superintendent of the Baltimore plant, National Can Corp.

Clinton E. Stryker, formerly vice president and assistant to the president, Nordberg Mfg. Co., Milwaukee, has been elected president and general manager, Adel Precision Products Corp., Burbank, Calif.

Charles R. Reeves, with Kalamazoo Stove & Furnace Co., Kalamazoo,

Mich., since 1942, has been named works manager. Mr. Reeves formerly was production engineer with Associated Engineers, Ft. Wayne, Ind., production manager, Rayon Machinery Co., Cleveland, and earlier was associated with Link-Belt Co., at Indianapolis.

H. O. Pihl has been elected to succeed his father, O. F. Pihl, as secretary-treasurer, Louis Allis Co., Milwaukee. The elder Mr. Pihl, with the company more than 40 years, continues as a member of the board of directors. Paul M. Haaack is assistant secretary-treasurer, Louis Allis Jr., sales manager and member of the board, E. J. Taylor, assistant sales manager, Frank O. Kovich, works manager, and Roy Schneider, superintendent.

Joseph F. Heil has been elected president, Heil Co., Milwaukee, succeeding his father, Julius P. Heil, founder and president for many years, who retains his position as treasurer and member of the board. Joseph Heil has been executive vice president of the company since 1938, joining the company in 1923. He is a director of the National Association of Manufacturers.

Carl E. Jones has been appointed assistant sales manager, Agiloy Tubing Co., with headquarters at the company's plant in Springfield, O.

L. R. Rothenberger has been appointed general sales manager, Doall Co., Minneapolis and DesPlaines, Ill. Mr.

Rothenberger, associated with the company 7 years, has been active in its sales program for the past 3 years.

G. Gordon Lloyd has been named general superintendent of the Buffalo plant, Wickwire Spencer Steel Division, Colorado Fuel & Iron Corp., to succeed Alvin F. Franz, who has been named works manager at Pueblo, Colo.

Charles F. Hauck has been placed in charge of the special department to handle problems of industrial waste and stream pollution recently established by Hall Laboratories Inc., Pittsburgh.

Francis H. Beaupre and Bruno II. Ramthun have been added to the staff of the application engineering department, Wheelco Instruments Co., Chicago.

John Smyly has been appointed general sales manager, J. M. Dalglisch & Co., St. Paul, manufacturers of metal products for the home, farm and industry. Mr. Smyly joined the Dalglisch company in January, 1944, as an engineer, serving in that capacity until the end of the war.

P. J. Patton Jr. has been appointed regional manager, Industrial Division, Ransome Machinery Co., Dunellen, N. J., and his territory includes: Chicago, Detroit, St. Louis and Cleveland. He will make his headquarters in Chicago.

F. J. Hoenigmann, for the past 6 years executive vice president and general manager, Cribben & Sexton Co., Chicago, has been elected executive vice president, Florence Stove Co., Gardner, Mass.

Edward S. Perot has been elected president, Ford Instrument Co., Long Island City, N. Y., a subsidiary of Sperry Corp. Mr. Perot is a director of the company and is assistant to the president of Sperry.

Thomas F. O'Brien has been appointed metallurgist, Kali Mfg. Co., Philadelphia. Mr. O'Brien will have charge of sales and engineering on the metallurgical chemicals manufactured by that company.

William H. Hugus has been appointed manager of sales, Caspers Tin Plate Co., Chicago. Formerly he was associated with the Tin Plate Division, Carnegie-Illinois Steel Corp., Pittsburgh.

E. C. Conary has become affiliated with the department of engineering research, National Engineering Co., Chicago. Since graduation from Missouri

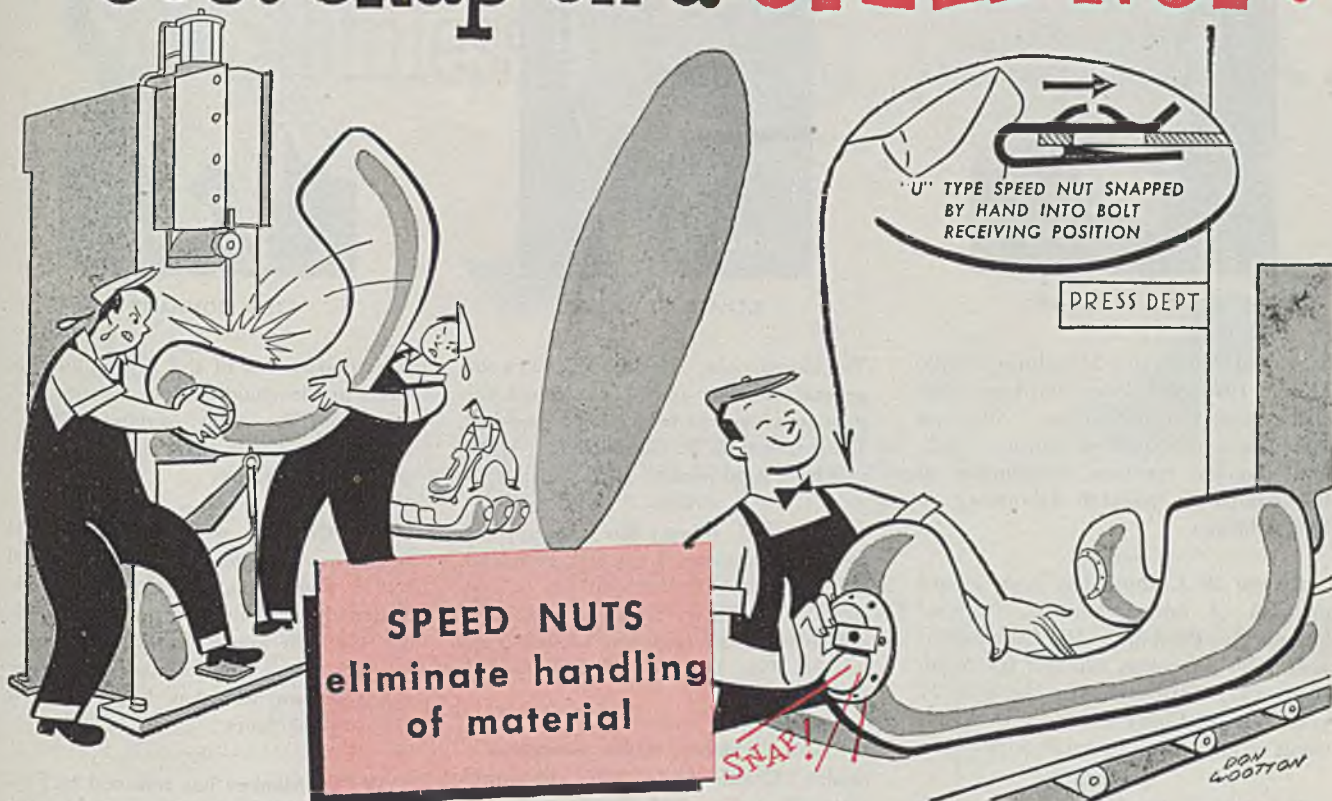


CHARLES R. REEVES



L. R. ROTHENBERGER

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One car builder used four welding machines to attach cage nuts on fender stampings for head lamp assembly. Three men were needed for each machine . . . one hauled stampings from the press department and two more wrestled the stampings and located them in fixtures on the welder. Because of all this handling, stampings were frequently damaged. And after painting, threads had to be re-tapped.

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P R S T E S T T H I N G I N F A S T E N I N G S



GEORGE B. CUSHING

School of Mines and Metallurgy, Rolla, Mo., in 1942, Mr. Conary has been chief chemist, cast armor plant. American Steel Foundries at East Chicago, Ind., and foundry research metallurgist at the company's research laboratory in East Chicago.

—o—

George B. Cushing has been named manager of sales promotion, National Supply Co., Pittsburgh. Mr. Cushing has been sales promotion manager for A. M. Byers Co., Pittsburgh, for the past 17 years. A. P. Colby continues as advertising manager of National Supply Co.

—o—

Dr. Jerome C. Hunsaker has been elected to the board of directors, Sperry Corp., New York, to succeed O. Max Gardner, new undersecretary of the United States Treasury Department.

—o—

Dr. Paul O. Powers has been named to the staff of Battelle Memorial Institute, Columbus, O. Dr. Powers will aid in research on plastics, organic coatings, synthetic resins, plasticizers and other phases of synthetic chemistry.

—o—

David E. Lukens has been appointed engineering representative, Autogiro Co. of America, Philadelphia. He will continue also as sales engineer for the Sumner Tubing Co., Bridgeport, Pa.

—o—

F. B. Hornbrook has been appointed assistant director of research, Master Builders Co., Cleveland. Since 1930, Mr. Hornbrook served as assistant to section chief of the Cement and Concreting Materials Section, National Bureau of Standards.

—o—

Leonard M. Freeman has been appointed manager of the newly established works laboratories, B. F. Goodrich Co., Akron, O. Joseph C. Herbert has been named factory manager of the company's recently acquired tire plant at



RICHARD H. WHERRY

Tuscaloosa, Ala. Stanley W. Caywood, general manager of the company's foreign activities, has been named president, International B. F. Goodrich Co., which will have headquarters in Akron.

—o—

Richard H. Wherry has been appointed chief engineer, Liquefied Petroleum Gas Division, Weatherhead Co., Cleveland. Mr. Wherry formerly was assistant to the chief engineer, Liquefied Petroleum Gas Division, Skelly Oil Co., Tulsa, Okla.

—o—

Frank G. Moore, traffic manager, Columbia Chemical Division, Pittsburgh Plate Glass Co., and the Southern Alkali Corp., has been elected chairman of the traffic committee, Manufacturing Chemists Association of the United States.

—o—

W. S. Colson, St. Louis, has been appointed sales representative by Gibson Electric Co., Pittsburgh. His territory includes Missouri, Kansas, Arkansas and Oklahoma.

—o—

Walter E. Brian, for several years advertising and sales promotion manager, Northwestern Steel & Wire Co., Sterling, Ill., has joined the staff of Gebhardt & Brockson Inc., Chicago, advertising agency, as account executive.

—o—

Raymond W. Andrews, formerly a commander in the Navy, has been appointed merchandising manager in the Radio Division, Sylvania Electric Products Inc., Ipswich, Mass.

—o—

William H. Thomas Jr. has been appointed sales manager, Pressure Castings Inc., Cleveland.

—o—

Alvin L. Krieg has joined the public relations department, American Steel & Wire Co., Cleveland. From 1941 to 1943 Mr. Krieg served with the public rela-



J. B. CONNALLY

tions department of the Army Ordnance office in Cleveland, and in August, 1943, went into the Army, serving with the Ninth Army headquarters in France, Belgium and Germany.

—o—

J. B. Connally, who has served for 33 years as manager of purchases and traffic, Mesta Machine Co., Pittsburgh, retired from active service March 15. Mr. Connally joined the Mesta company 43 years ago. He is succeeded by Russell Clarkson who has been with the company 29 years.

—o—

W. Art Mankey has returned to Ryan Aeronautical Co., San Diego, Calif., after an absence of 20 years, as assistant to the president. Mr. Mankey will act as co-ordinator of aircraft engineering and experimental manufacturing departments.

—o—

Vincent R. Kelly, Indianapolis, has been appointed by Udylite Corp., Detroit, as sales engineer for the Indiana territory.

—o—

Richard C. Taylor, secretary, Scate Co., Oakmont, Pa., has resigned, effective April 1, to become general manager, Harris Calorific Sales Co. of St. Louis, distributors of gas welding and cutting equipment.

—o—

Walter C. Weed has been elected president, Weed & Co., Buffalo, succeeding the late Shelton Weed.

—o—

Ferd Luyben, formerly tool superintendent, Ft. Wayne, Ind., works, International Harvester Co., is works manager of Weddell Tools Inc., Rochester, N. Y.

—o—

Ampco Metal Inc., Milwaukee, has announced the following appointments: J. R. G. Harris, manager resistance welding sales; D. S. Goebel, manager, mill products sales; G. E. McCulloch, manager, safety tool sales; F. C. Hawks, field

For the Answers

to Stainless forming problems...

like

Spring-Back? How much spring-back should we allow for in designing dies to dish 12-in. dia., ES 18-8 (Type 302) reflector bowls 2 in. deep, from 10-gauge sheet?

Best Finish for Drawing? What sheet finish is best for deep-drawing, and how can we obtain the highest drawn finish—without after-polishing—on heavy ES 18-8LC (Type 304) hospital ware?

Bending Cylinders? Can we form 3-ft. dia. cylinders in ES 12 Stainless plate (Type 410) on bending rolls? Can it be done from the flat in one pass?

Scratch Protection? What is the best way to protect polished Stainless sheet from scratching on a bending brake?

Deep Spinning? Can ES 18-8LC sheet (Type 304) be spun deeper with a bar or roll spinning tool? What do you recommend as a lubricant and how should it be applied?

How Many Operations? How many draws and reanneals will be necessary to cup an 8-in. dia. 20-gauge shell 6-in. deep in ES 17 (Type 430) sheet?

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PAUL K. POVLSSEN

Recently named vice president and general manager, Maguire Industries Inc., Bridgeport, Conn., noted in STEEL, March 4 issue, p. 116.

engineer, mill products, with headquarters in Chicago. Al Jense has been named manager of the licensing bureau.

Otto F. Seidenbecker has been elected president, Stefco Steel Co., Michigan City, Ind. For the past 7 months Mr. Seidenbecker has been assistant to the president, Chicago Steel Service Co.,



CLEVE W. RITZ

Who is in charge of the recently opened warehouse of Edgar T. Ward's Sons Co. at Dayton, O., noted in STEEL, March 18 issue, p. 98.

Chicago. In April, 1945, Mr. Seidenbecker resigned as vice president, Wisconsin Steel Co., Chicago, a subsidiary of International Harvester Co., with which he had been associated 32 years.

Roscoe M. Smith is superintendent of all village plants of the Ford Motor Co., Dearborn, Mich., and not president as



LARS E. EKHOLM

Who has joined the metallurgical engineering staff, Climax Molybdenum Co., New York, and noted in STEEL, March 18, issue, p. 100.

was incorrectly stated in the March 18 issue of STEEL, p. 103.

George D. Lain has been appointed research engineer of the Committee on Steel Pipe Research, American Iron & Steel Institute. Until recently, Mr. Lain was production manager, Consolidated Machine Tool Co., Rochester, N. Y.

OBITUARIES...

Brent Wiley, who retired recently as managing director, Association of Iron & Steel Engineers, died at Sarasota, Fla., March 19. He had been associated with Carnegie Steel Co., Wellman-Seaver-Morgan Co., Westinghouse Electric Corp., and became managing director of the association in 1936.

Frank Parker, 56, chairman, Iron & Steel Products Inc., Chicago, died March 17 in that city. Mr. Parker was a past president of the Chicago chapter, Institute of Scrap Iron & Steel Inc., and also had served as vice president of the national organization. Prior to founding Iron & Steel Products in 1930, Mr. Parker was president, Railway Car & Equipment Corp., Chicago, and before that was associated with Republic Iron & Steel Corp. as assistant general superintendent of its Western Division handling purchasing and operating details.

Joseph W. McLean, who retired Nov. 1, 1945 as president, Simonds Abrasive Co., Philadelphia, died in that city recently. Mr. McLean had been associated 44 years with Simonds Saw & Steel Co., parent company of the abrasive concern.

Walter Hindley, 72, president and treasurer, Hindley Mfg. Co., Valley Falls,

R. I., died March 10. Mr. Hindley was manager of the organization from 1897 to 1937 when he retired, carrying on as president and treasurer until his death.

Charles E. Van Norman, 86, chairman of the board, Van Norman Co., Springfield, Mass., died at his home in that city recently. In 1882 Mr. Van Norman entered the business founded by his father, the Waltham Watch Tool Co., Waltham, Mass., which manufactured watchmakers' lathes and tools. That company later discontinued watch tools to manufacture larger milling machines. Mr. Van Norman served as president of the company from 1912 to 1940 when he became chairman of the board.

Frank L. Boutet, 52, president and owner, Farnham Mfg. Co., Buffalo, died recently.

John Y. Sloan, 73, since 1928 vice president in charge of sales, Pullman-Standard Car Mfg. Co., Chicago, died March 13 in Highland Park, Ill. He had been associated with the company 45 years.

Harry E. Hartman, with the Wire Branch of WPB, and the Civilian Production Administration since 1941, died recently in Florida. Mr. Hartman, before retiring several years ago, had been

associated with the Indiana Steel & Wire Co., Muncie, Ind.

Clifford T. Ward, 55, superintendent of the rod and wire mill, Johnstown, Pa., plant, Bethlehem Steel Co., died March 11, at his home in that city.

Frank W. Chew, 42, president, Arrow Engineering Co., Hillside, N. J., died recently at his home in Orange, N. J.

Albert W. Balderson, 69, one of the original founders of the Beloit Foundry Co., Beloit, Wis., died recently in that city.

Frank Campsall, 62, a director of the Ford Motor Co., Dearborn, Mich., died March 16 in Savannah, Ga. Mr. Campsall joined the Ford company in 1912, later becoming general secretary to Mr. Ford. In 1943 he was named assistant general manager of the company.

William H. Hirst, 64, president of the H. & H. Scrap Iron & Metal Co., Wauwatosa, Wis., died March 11 in Pasadena, Calif. Mr. Hirst served as purchasing agent for the Rundle Mfg. Co., Milwaukee, for approximately 20 years prior to organizing the H. & H. company in 1931 with A. J. Hammer-schlag.

Tin Stocks Drop As Imports Continue Light

Although consumption in 1945 was less than in 1944, stock piles continue decline. Balance not expected until late-1947

ADDITIONAL relaxation of controls over consumption of tin cannot be predicted, Civilian Production Administration says, because the current prospects for additional new supplies during 1946 are not bright and existing stocks will have to be spread over such time until there is a regular flow of metal from the Far East.

Stocks of tin in the United States as of Jan. 1 totaled only 91,623 long tons compared with 107,212 tons as of Jan. 1, 1945. Stocks at the beginning of the year included 68,026 tons of government stocks of which 32,536 tons were in the form of concentrates and 35,490, pig tin. Government stocks included 12,140 tons of Treasury and Navy reserve stocks which are not available for allocation. Privately-owned stocks amounted to 23,597 tons of which 14,951 tons were pig tin and the balance in other forms, including small amounts of bar tin, anodes, powder, tin in process, and recoverable tin in alloy scrap.

Consumption of tin in 1945 was about 6000 tons less than in 1944, largely because of a sharp curtailment of military consumption during the latter half of the year. For the first time since 1942 tin plate regained its lead as the chief category of consumption, while consumption in bronze is falling toward its normal peacetime rate.

Unsettled Conditions Slow Production

Prospects for supplies of tin are not firm beyond the first six months of 1946. During that time, the United States probably will receive about 15,000 tons of tin in concentrates and about 6650 tons of metal. During the second half of the year, CPA is not counting on more than 15,000 tons of tin in concentrates and 6650 tons of metal. Only relatively small tonnages were found in the Far Eastern areas and government reports show that production of concentrates in Malaya during 1946 will not be more than about 12,300 tons. Production in the Netherlands East Indies promises to be very small due to unsettled conditions in that area. Reports from Bolivia and Belgian Congo indicate that pro-

duction in these countries will be much less in 1946 than in 1945. Therefore, CPA predicts a new supply of tin from foreign sources of not more than 42,000 tons in 1946.

Balance between available supplies and demand is not indicated until sometime in late 1947 or 1948. Production of secondary pig tin declined 22 per cent last year, reflecting the greater use of lighter coatings and the decline in tin can collections. Imports of tin declined from 36,544 tons in 1944 to 33,529 in 1945, the latter including 25,984 tons from Bolivia and 7401 from Belgian Congo.

Based on present restrictions, consumption of virgin pig tin in 1946 is estimated at 65,000 tons compared with 58,620 tons in the previous year. Compared with an estimated new supply of 42,000 tons, this indicates a deficit of 23,000 tons, or withdrawal from stocks at the rate of nearly 2000 tons per month. The net reserve stock at the end of 1946 is estimated at only about 15,000 tons. At 1946 rates of withdrawal, this amount would last to just about midyear of 1947.

Dutch Tin Output To Be Upped by 4 New Dredges

Production of Banka and Billiton tin this year, largely as a result of American assistance, is expected to be somewhere between 6000 and 10,000 tons. With further help from this country the production of those two areas should reach a level of somewhere between 30,000 and 40,000 tons annually. Achievement of this enlarged output from the Dutch East Indies is expected to be reached about the middle of 1947 on the assumption that four new dredges will be put into operation about that time.

Two of these dredges are being built

in Holland, and two are being built by Bucyrus Erie Co., South Milwaukee, Wis. The two dredges being built here were procured by a Dutch interest, Mining Equipment Co., New York, and represent an outlay of \$3,700,000. It is hoped that these two dredges can be shipped in December of this year.

Rehabilitation of the tin properties in British Malaya also is going forward, but because the necessary equipment will be shipped from United Kingdom shops, not much is known in this country as to when full production in that part of the world can be achieved. The only help from the United States to production in British Malaya is being furnished to Pacific Tin Co., an American interest with properties in that district.

Products of Tomorrow Show Postponed Indefinitely

Due to the uncertainty of products and delivery schedules of large numbers of the nation's manufacturers, the Products of Tomorrow Exposition scheduled to open at the Chicago Coliseum, April 27, has been indefinitely postponed, according to Marcus W. Hinson, general manager of the exposition.

Packaging Exposition Is Planned for Atlantic City

Reflecting the great strides made in the fields of packaging and shipping during the past twenty years and particularly during the war years, the Packaging Exposition of 1946 will be held in the Public Auditorium, Atlantic City, N. J., Apr. 2-6, it was announced by the American Management Association, sponsoring organization.

Calendar of Meetings . . .

Mar. 26, Blast Furnace & Coke Association of the Chicago District: Meeting, Del Prado Hotel, Chicago. Association headquarters are at 3500 South Pulaski Rd., Chicago 23.

Mar. 28, Association of Steel Re-Distributors: Annual meeting, Congress Hotel, Chicago. Association headquarters are 39 Broadway, New York 6.

Mar. 28-29, American Gas Association: Conference on industrial and commercial gas, Commodore Perry Hotel, Toledo, O. Harry A. Sutton, chairman.

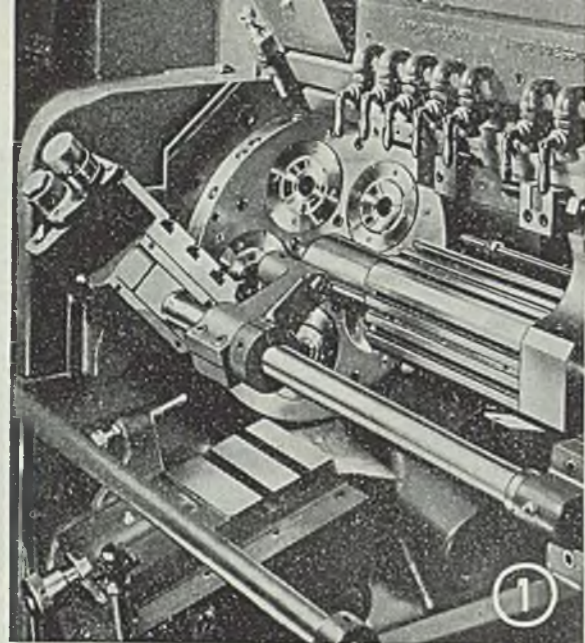
Mar. 29, Central District Enamellers Club: Meeting, Hollenden Hotel, Cleveland. William N. Noble, Ferro Enamel Corp., 4150 E. 56th St., Cleveland 5, is acting secretary.

Apr. 1, Packaging Machinery Manufacturers Institute: Semi-annual meeting, Hotel Dennis, Atlantic City, N. J. Association headquarters are at 342 Madison Ave., New York 17.

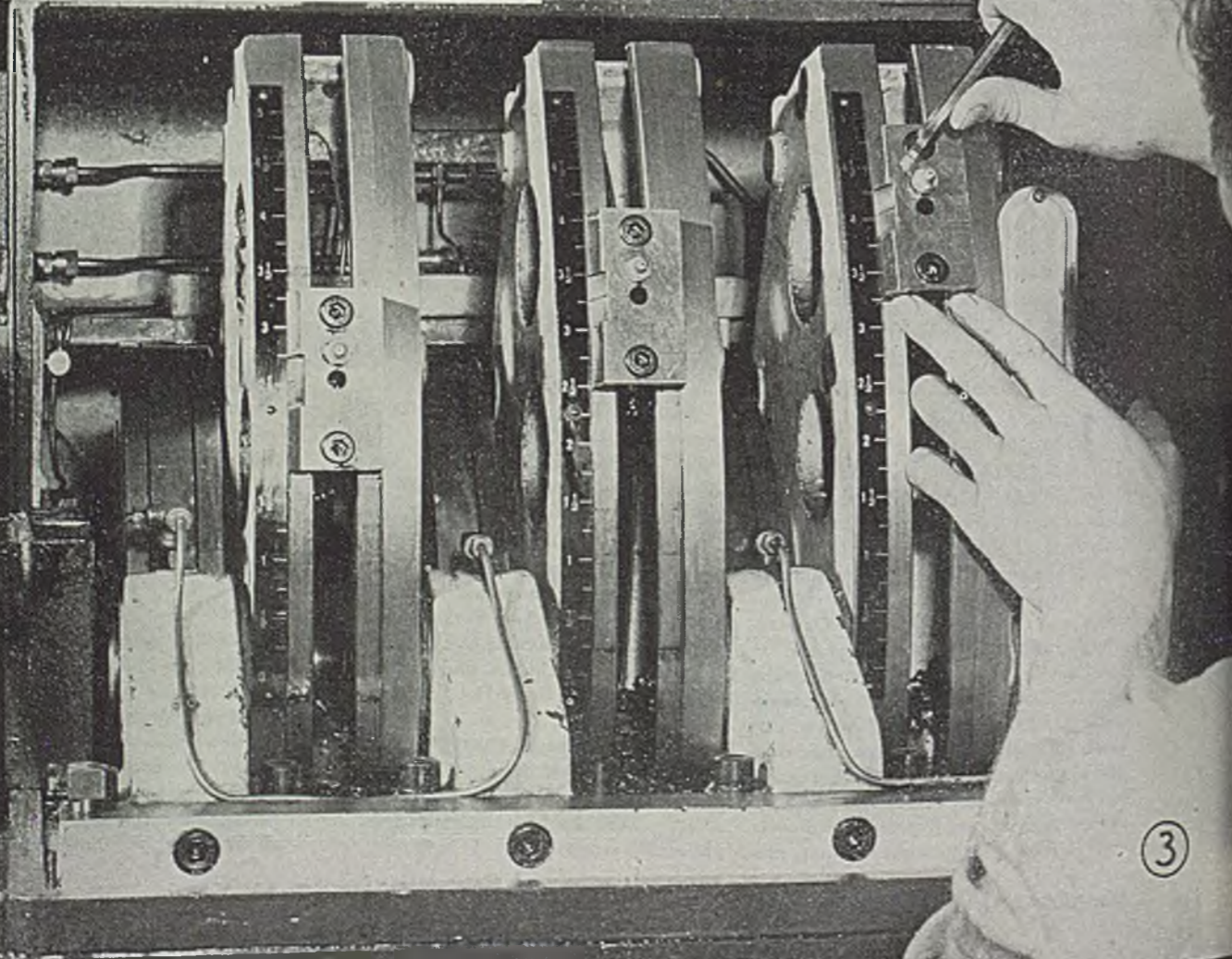
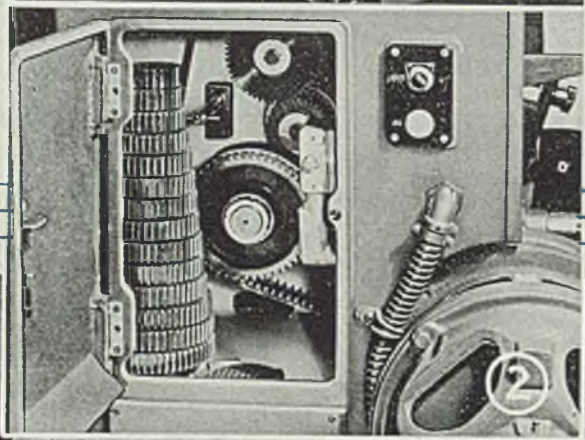
Apr. 1-3, American Society of Mechanical Engineers: Spring meeting, Chattanooga, Tenn. C. E. Davies, 29 West 39th St., New York 18, is secretary.

April 2-6, American Management Association: Packaging Exposition of 1946, Public Auditorium, Atlantic City, N. J. Association headquarters: 330 West 42nd St., New York.

Apr. 3-5, Society of Automotive Engineers: Aeronautical meeting, Hotel New Yorker, New York. John A. C. Warner, 29 W. 39th St., New York, secretary.



Cam-less 5 SPINDLE Automatic



Setup time is reduced on new machine with quadrant linkage used to control length of feed strokes. Desired adjustment of turret and cross-slide movements is made by setting sliding block on graduated face of quadrants

NECESSITY for sets of interchangeable cams of various "throws", commonly employed to control the length of feed stroke in bar machines, has been eliminated in a new 5-spindle automatic. In their stead a convenient quadrant linkage arrangement is used. On this machine length of working stroke, ranging from 0 to 5 in., is obtained through the medium of an adjustable sliding block that requires only 2 to 3 min to adjust as against 30 - 60 min for the conventional methods. Warner & Swasey Co., Cleveland, maker of the machine, is the only manufacturer in the U. S. licensed to use the cam device patented by A. C. Wickman, Ltd., England.

Saving of time is especially important in present manufacturing techniques, and all the more so when many setups are required as when dealing with runs of small lots. Inasmuch as setup time has been so greatly reduced, these automatics are said to fill the gap between hand and conventional automatics and to be adaptable to either large or small production runs.

Five spindles are carried in an indexing drum. This does not have the type of lock bolt mechanism ordinarily employed. Indexed by a Geneva motion, this spindle carrying drum accelerates and decelerates during this cycle, being brought to stop slightly beyond working position. Then a toggle latch clamps it in exact location against a rigid stop. The drum is lifted hydraulically and rides on an oil film during its rotation. There is no shock during any part of the cycle.

A range of 24 spindle speeds in logical increments is obtainable by eight sets of comparatively small pick-off gears. These gears are light and easily changed. Storage space is provided for them in an easily accessible cabinet built into the "tailstock" end (Please turn to Page 144)

By JOHN PARINA, JR.
Assistant Editor, STEEL

Fig. 1—Closeup of spindles and working positions shows ampleness of tooling space. Cross-slides of spindles are equipped with micrometer adjustments

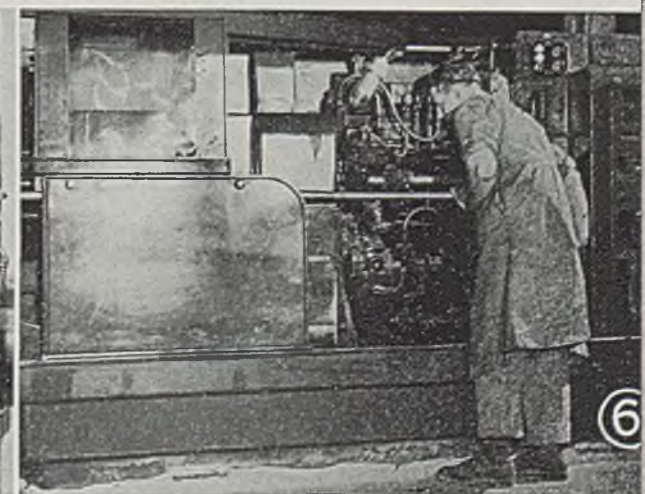
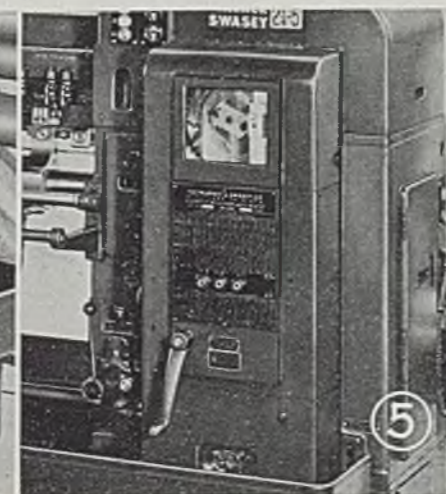
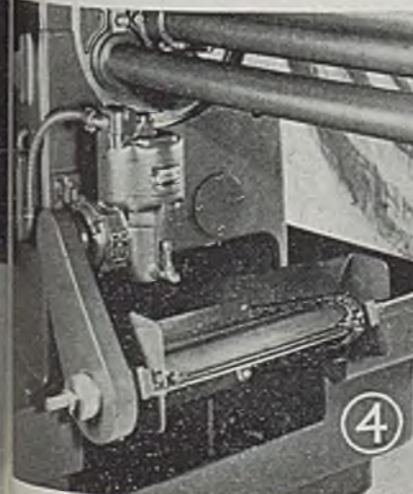
Fig. 2—Cabinet in tailstock end of machine for pick-off gears. Sliding shift lever for setting spindle speed is also located in this compartment

Fig. 3—Quadrant linkage that replaces interchangeable cams commonly used on bar machines is major feature of Warner & Swasey automatic. As illustrated, accurate control of feed strokes is obtained by relatively simple and easily made adjustment

Fig. 4—End view of chip conveyor located at headstock to mechanically remove chips and feed them into a container (container not shown)

Fig. 5—Quick change selective gear box eliminates necessity for separate, loose feed change gears

Fig. 6—View of the multiple spindle automatic in operation. Sufficient working space and tool clearance is incorporated in the basic design of the machine thus providing accessibility to tooling



GREASE

Lubricants

Great majority of the greases on the market today are of seven types. A knowledge of the properties and limitations of these seven types is an aid in determining what grease is best suited for a specific application and why

USE of greases has become so diversified in modern industry that large suppliers manufacture well over a hundred different products in order to meet the many demands. Greases, for example, are required to lubricate: Aircraft controls subjected to temperatures as low as minus 100° F in the stratosphere; steel mills for which extreme pressure qualities are demanded; electric motors which normally require a product having low starting and running torques combined with high resistance to oxidation; and construction machinery which is exposed to dirt and water in all kinds of weather. These are only a few of the many uses to which greases are put.

No single grease has been developed which might be termed a "universal grease", although this is the ideal goal of every grease research chemist. Greases have many inherent properties; to better understand these it is necessary to have a fundamental knowledge of the part each ingredient in a grease plays and the method of manufacturing greases.

Ingredients of a Grease

Fundamentally, greases are an intimate dispersion of soap and oil alone, or in combination with certain additives, the latter being added at times to impart certain desirable properties to the finished grease. To better understand the effect of each ingredient on the properties of a grease, a brief summary of their functions is as follows:

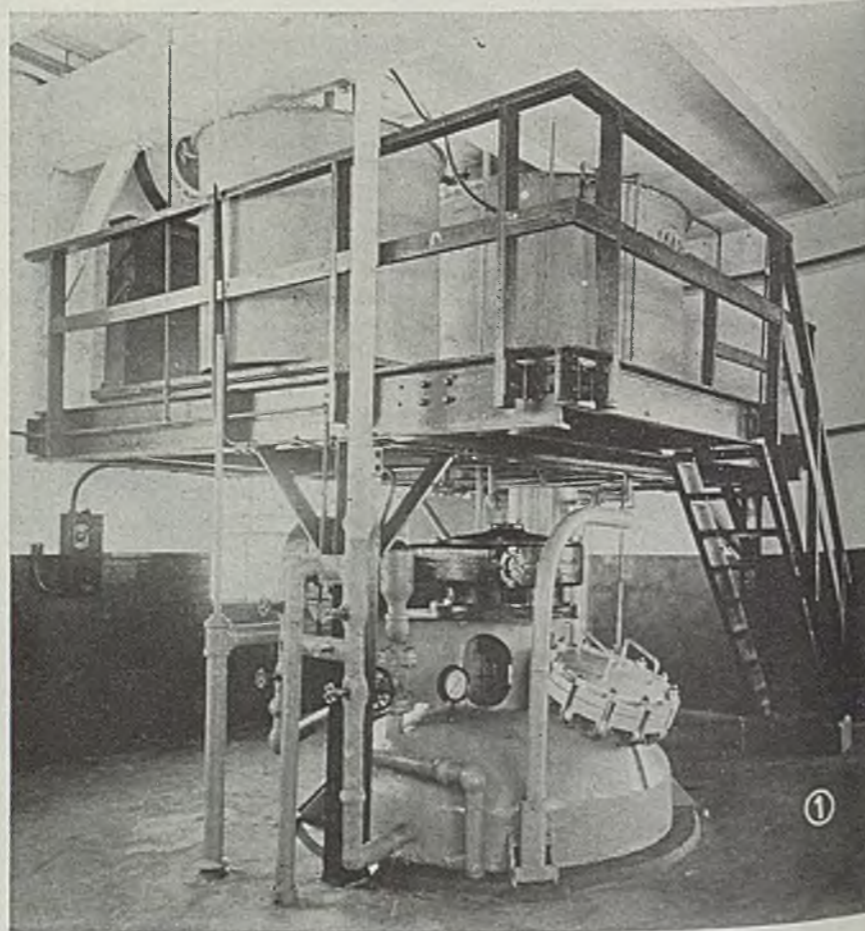
Primary purpose of soap in a grease is to serve as a thickener for the oil, not only at room temperature but throughout the entire temperature range in which greases are used. Different soaps, however, have radically different effects on the final product.

Soap results from the chemical reaction of a fat or fatty acid and an alkali, such as sodium or calcium hydroxide.

Alkali used is a predominating factor in the resultant qualities of the soap and ultimately the grease. For example, soap made from calcium hydroxide is insoluble in water and

usually results in a grease which is smooth, buttery and has a melting point of approximately 180° to 225° F; soaps made from sodium hydroxide produce greases which may be fibrous or stringy, having melting points ranging from 300° F to 400° F or higher, and are popularly termed soluble in water.

The choice of fat or fatty acid used in the manufacture of soap contributes materially to the final properties of the grease; some have a tendency to give larger yields of grease, i.e., the necessary hardness in the final grease can



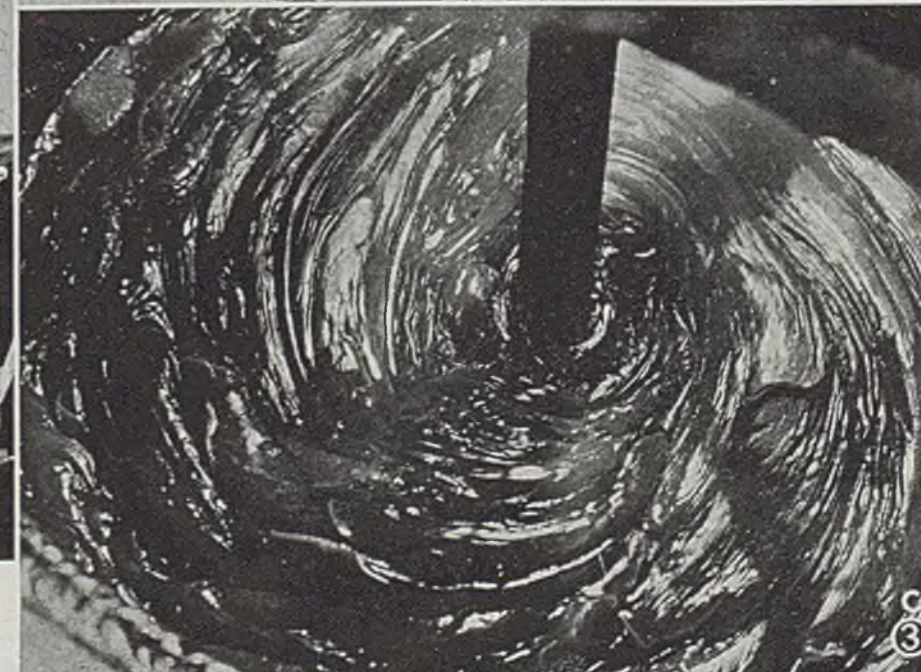
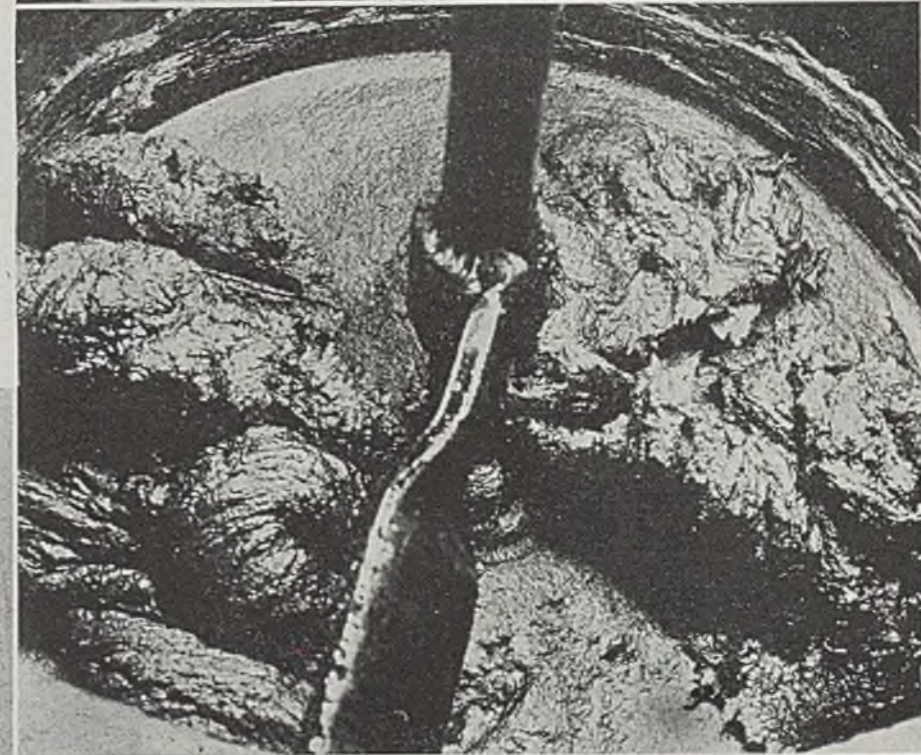
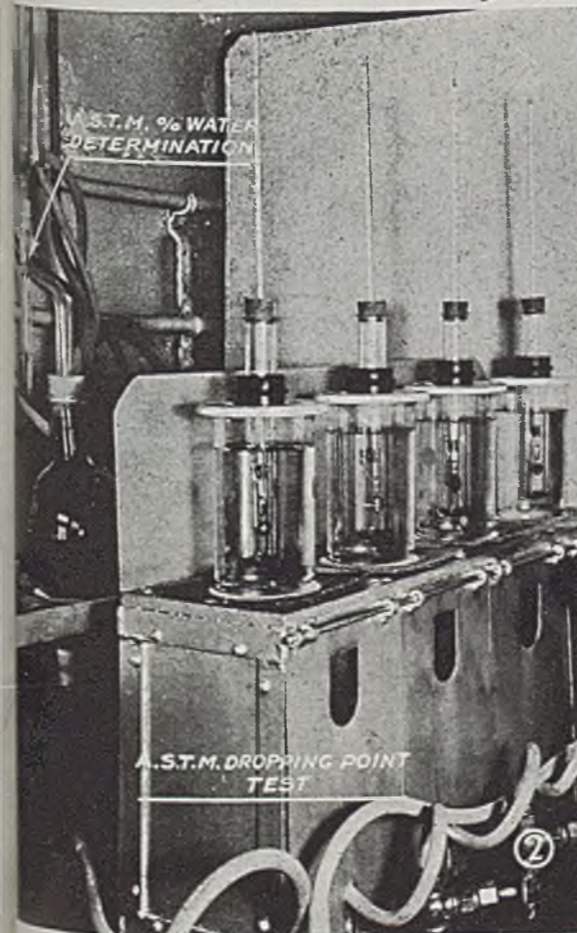
By J. C. VAN GUNDY
Technical and Research Division
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New York

Fig. 1—Top view of a pressure kettle. Tanks are mounted on platform scales to insure accurate measurement of ingredients going into kettle

Fig. 2—Typical laboratory tests used to control the quality of finished greases

Fig. 3—Various stages in the manufacture of a sodium soap base grease: (a) Soap before the addition of oil, (b) soap to which has been added a portion of the oil, (c) finished grease ready to be drawn

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be obtained with a smaller percentage of soap. Others affect the melting point, appearance, tendency to bleed oil and oxidation characteristics.

Fatty ingredients used in the manufacture of greases are obtainable from all animals and from many of the seeds and fruits of plants and vegetables. The most common are obtained from animal fats; for example, lard, tallow, stearic acid, wool grease, sperm and hydrogenated fish oil. The more common vegetable fats are: Rapeseed, cottonseed and olive oil.

A second major component in a grease is the mineral oil. In the choice of this there is available all of the hundreds of oils produced from petroleum. If a grease is being planned for light duty machinery, a low viscosity light-colored oil is chosen. If, however, a lubricant is being planned for heavy equipment, such as dredges, locomotives, etc., a heavier mineral oil may be chosen. Generally, a grease is selected for use in a bearing containing the same viscosity oil as would an oil, if the bearing were oil lubricated. Notable exceptions to this very broad rule are encountered at extremely low or high operating temperatures and will be explained in more detail in the second article of this series.

Certain soaps and oil are not compatible and in such cases a third ingredient, termed a stabilizer, is added in small amounts which results in the three ingredients, soap, oil and the stabilizer forming a stable grease.

Ordinary cup greases, which are composed of a calcium soap and oil, show the importance of stabilizers. These two ingredients usually will not mix to form a grease unless a small amount of stabilizer, in most cases water, is added. This is one of the reasons why cup greases stabilized with water cannot normally be used much above about 175° F; above this temperature the water evaporates rapidly and as a result the oil and soap tend to separate. Chemical stabilizers with boiling points well above 212° F have been used successfully in grease manufacture, and several greases of this type are on the market today.

Present day trends of industry towards heavier loads on bearings, increased speeds, higher operating temperatures, etc., necessitate use of additives in specialized cases to impart extreme pressure characteristics, oxidation resistance, rust prevention, tackiness and other more desirable characteristics to greases than can be obtained with a grease containing soap and oil only. As time goes on the use of additives in greases will grow.

Graphite, talc and asbestos are sometimes incorporated in greases when such products are to be used as heavy duty lubricants where high temperatures or washing action may tend to remove the grease and leave behind a film of the mineral additive which will prevent seizure.

Graphite is, by far, the most popular mineral additive used in greases; it serves two purposes. First, when used on semi-finished type plain bearings, it tends to fill in rough spots, thus giving a smoother bearing surface. Second, graphite, commonly termed a "solid lubricant," has some friction reducing value.

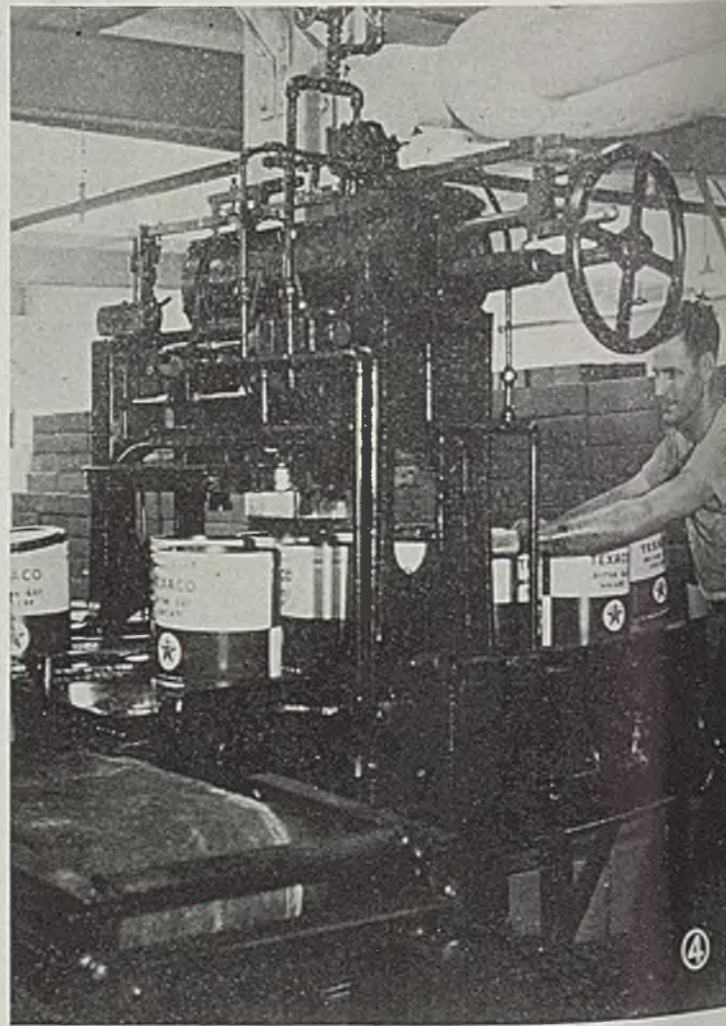
This product, purchasable in many forms and states of purity, does not enter into any combination with the grease—the grease acts only as a carrier. For precision lubrication as on ball bearings graphite is considered to be an abrasive, however, for heavy work, such as roll necks in steel mills, curve rails and fifth wheel lubrication of truck-trailers, addition of graphite is sometimes beneficial.

There are other cases where a grease may act as a carrier for an inert material, a typical example being pipe thread lubricant, which is normally a mixture of a calcium soap grease and metal dust such as zinc, or metal oxides.

Method of Grouping Greases

Generally, the type of soap used in manufacture of greases has much more to do with the appearance and properties of a grease than does the oil. It is for this reason that the type of soap in a grease is generally used as a basis of classification.

Most commercial greases today can be classified in



seven groups. These greases are listed below:

1. Calcium soap base or cup grease.
2. Calcium resinate soap base or axle grease.
3. Sodium soap base—grease-general.
4. Sodium soap base—brick grease.
5. Aluminum soap base grease.
6. Lithium soap base grease.
7. Mixed base greases.

These are the more common types of greases on the market today, although many other types have been made experimentally and a few have found their way to commercial markets. Greases made from barium, for example, are comparatively new. These have a complex manufacturing procedure and certain inherent properties which,

(Please turn to Page 111)

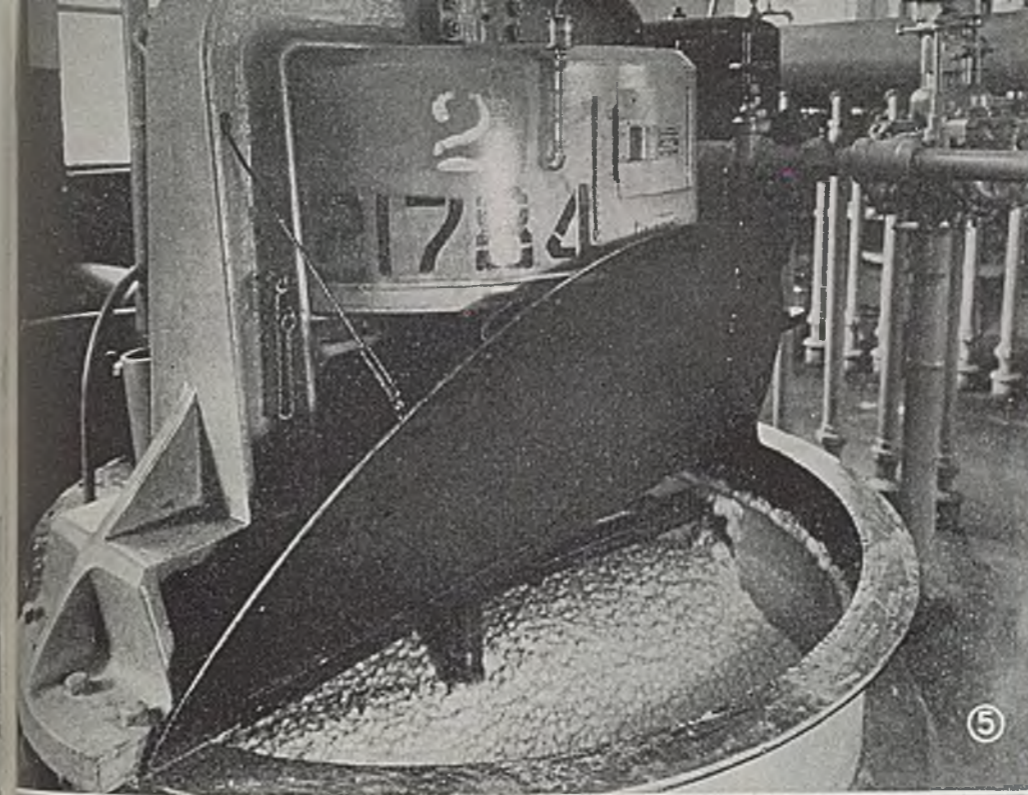


Fig. 4—Twenty five-pound can filling machine. Covers are placed on cans immediately to prevent possible dirt contamination

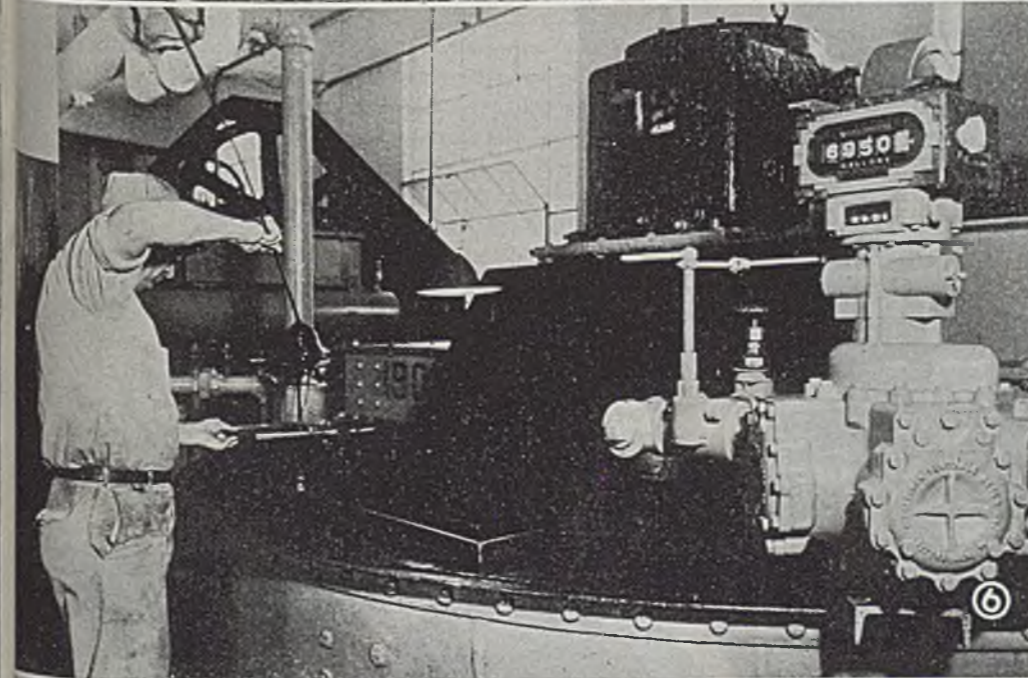


Fig. 5—Small plant size kettle for manufacturing miscellaneous greases

Fig. 6—Removing a sample of grease from kettle for control penetration test. Metering device at the right is used to accurately measure oil added to the soap

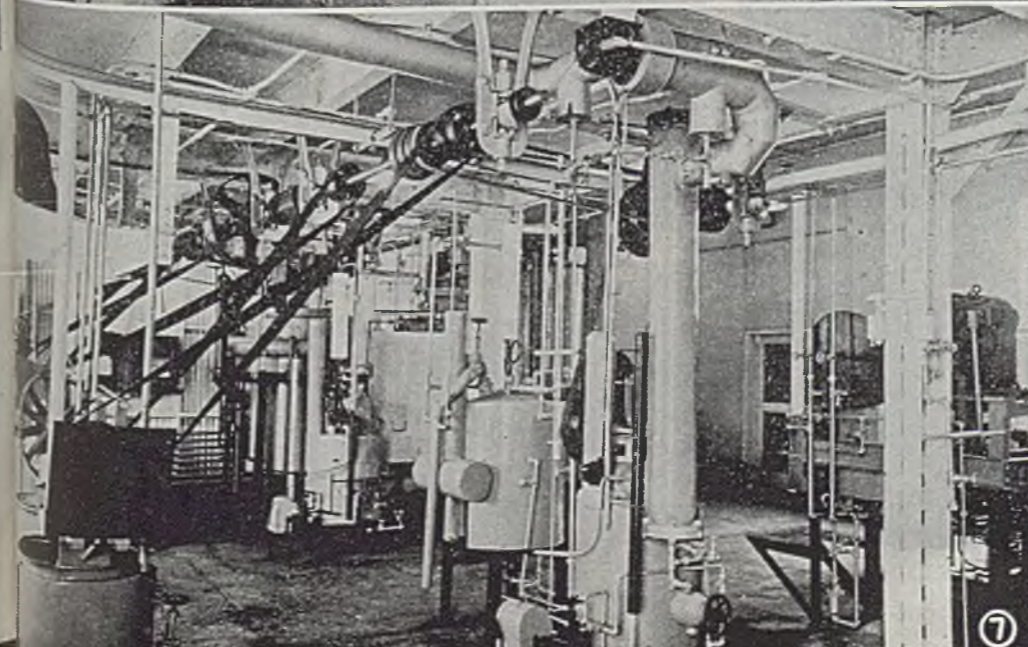


Fig. 7—Laboratory grease kettles. Before the first plant size batch of a new product is produced, many laboratory batches have to be made before the right combination of ingredients and various manufacturing techniques are perfected

HIGH-SPEED FRICTION SAWING

By the time machines capable of sustaining high-speed friction sawing operations were introduced, saw bands for use at speeds up to 15,000 fpm were ready for them. With progress made during war, process has vastly increased scope

IN high-speed sawing of steel, 3,240,000 saw teeth slice through tough metal at a blade velocity of 15,000 fpm. This may sound fantastic, but it is what actually takes place when a 255-in. band saw of 18-pitch is friction sawing $\frac{3}{8}$ -in. thick tungsten steel.

The friction sawing process has made great strides in recent years, especially during the last and most critical period of the war. Progress made by the band-saw method has been particularly noteworthy.

Long before the introduction of high-speed machines, precision saw bands already had been developed to a point where they were capable of velocities up to and exceeding 15,000 fpm and were cutting very efficiently alloy steels of 12 to 18-in., thickness at then standard speeds. Therefore, it only remained to design equipment of suitable power, strength and rigidity to support cutting operations at the accelerated speeds to provide industry with an almost revolutionary band sawing technique. What this modern material-shaping method has accomplished in a very short time should direct attention to its cost-reducing possibilities for production still to come.

The friction sawing process is not new and literature on

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the subject contains much valuable information. However, there has been a tendency to exaggerate its known limitations and to foresee difficulties in high-speed practice which probably do not exist. Wise choice of equipment for a particular job, from a considerable number and variety of equipment manufacturers' stocks, at once removes many uncertainties.

Most of the questions propounded by those interested in adapting friction sawing to their own uses have been answered adequately, first in laboratory tests and later in production achievements. One of the commonest is this—"Does friction sawing require a special type of band and, if not, how can a regular hardened-tooth band saw stand the

excessive heat generated by friction?" It is a logical question and requires a logical answer. Regular standard-pitch bands are used for friction sawing, provided they are of the highest quality, with the tooth hardness only extending to a depth to allow maximum flexibility life of the blade under severe strains.

Width of bands vary from $\frac{1}{4}$ to 1-in., but the widest band consistent with radius or contour being sawed should be used. For straight cutting, blades 1-in. wide may be used. Pitch must be neither too fine nor too coarse. Depending upon thickness of material to be cut, 10, 14 and 18-pitch saws have been found to give maximum tool life.

As to the questions of the effect of heat generated in the saw teeth, the fact remains that the section of the blade doing the actual cutting is only in contact with the material being cut for a fraction of a second, hence the small amount of heat generated is dissipated as the band

(Please turn to Page 145)



MATERIALS NOW EFFICIENTLY FRICTION SAWED AND THEIR SAW CONTROL FACTORS

STEELS—S.A.E.	SAW VELOCITY			SAW PITCH		
	Thickness $\frac{1}{8}$ "- $\frac{3}{8}$ "	Thickness $\frac{3}{8}$ "- $\frac{1}{2}$ "	Thickness $\frac{1}{2}$ "- $\frac{3}{4}$ "	Thickness $\frac{1}{8}$ "- $\frac{1}{4}$ "	Thickness $\frac{1}{4}$ "- $\frac{3}{8}$ "	Thickness $\frac{3}{8}$ "- $\frac{1}{2}$ "
Carbon Steel No. 1010-No. 1095	3,000	5,000	12,000	18	14	10
Manganese Steel No. T1330-No. 1350	3,000	5,000	12,000	18	14	10
Free Machining No. X1112-No. X1340	3,000	5,000	12,000	18	14	10
Nickel Steels No. 2015-No. 2515	3,000	6,000	13,000	18	14	10
Nickel Chromium No. 3115-No. 3415	3,000	6,000	13,000	18	14	10
Molybdenum Steel No. 4023-No. 4820	3,000	6,000	13,000	18	14	10
Chromium Steels No. 5120-No. 5150	3,000	6,000	12,000	18	14	10
Chromium Steels No. 51210-No. 52100	5,000	10,000	14,000	18	14	10
Chromium Vanadium No. 8115-No. 8195	5,000	12,000	15,000	18	14	10
Tungsten Steel No. 7260-No. 71360	5,000	12,000	15,000	18	14	10
W.E. Steels No. 8024-No. 8949	5,000	12,000	15,000	18	14	10
Silicon Manganese No. 9255-No. 9260	5,000	12,000	15,000	18	14	10
OTHER STEELS						
Armor Plate	3,000	9,000	13,000	18	14	10
Stainless Steel 18-8	3,000	9,000	14,000	18	14	10
Alum.	4,000	12,000	15,000	18	14	10
Cast Steel	3,000	9,000	12,000	18	14	10
CAST IRONS						
Gray Cast Iron	3,000	5,000	7,000	18	14	10
Malleable Cast Iron	3,000	5,000	7,000	18	14	10
Mechanite Castings	3,000	5,000	7,000	18	14	10

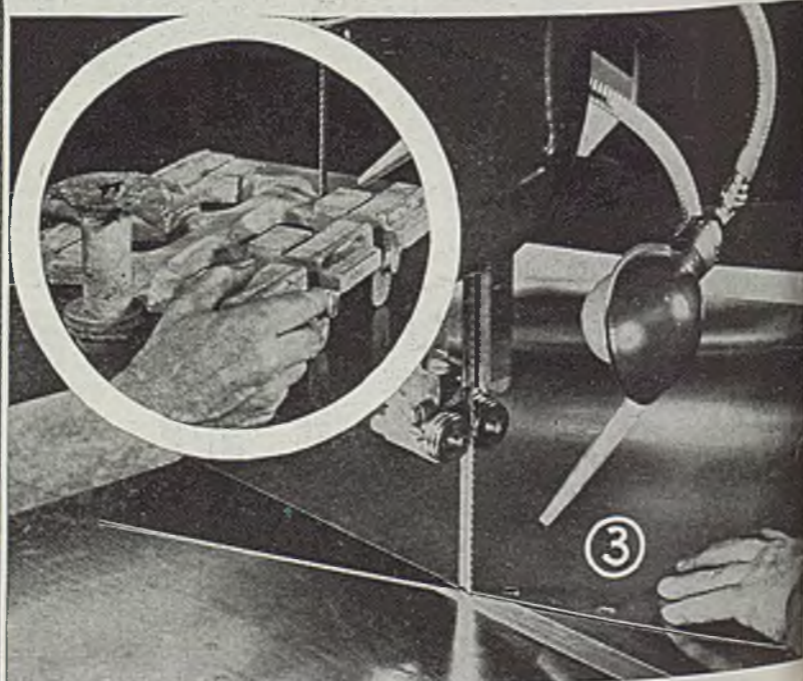
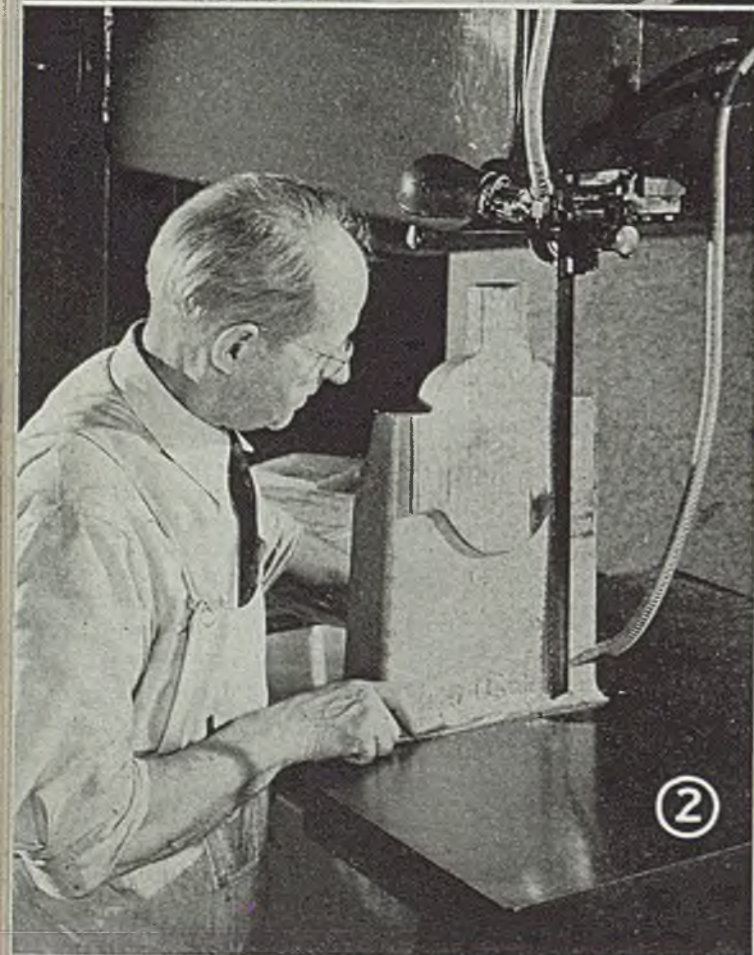
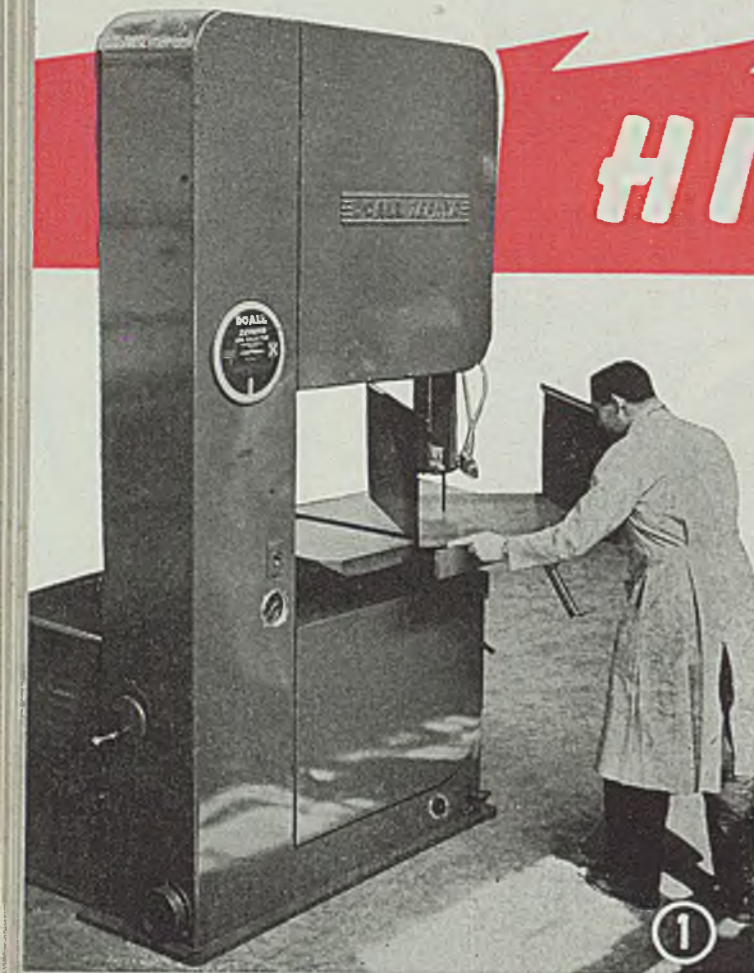


Fig. 1—Contour friction sawing is as simple as straight-line sawing. Here deep throat of machine is advantageous for radius cutting of a part with high sides

Fig. 2—Light metals such as aluminum and magnesium alloys, although not suited for friction sawing, can be sawed at speeds of from 2500 to 3000 fpm. A new type coarse pitch band has substantially increased cutting rate and improved the finish

Fig. 3—Tripling or quadrupling standard cutting rates by friction sawing is a commonplace these days. On some thin steel sheets, similar to the one shown, cutting rates at times exceed 600 linear feet per minute without unduly shortening saw life. (Inset) Castings lend themselves very well to friction sawing

Fig. 4—High-speed contour sawing teeth in these special mills reduces cost of previous method one-half

Three coatings for stainless steel

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WELDING ELECTRODES

BECAUSE wartime uses of stainless steel electrodes stimulated and accelerated research on basic coating types, the postwar commercial fabricator has been provided with electrodes that are much improved over the prewar products. Before the war two basic types of coatings were available: Lime and titania. In some instances welding was troubled by erratic coating breakdown, excessive fingernailing and insufficient arc stability. As a result of unprecedented volumes of stainless steel electrode production, these shortcomings have been overcome. Furthermore the number of coating types increased to three: Lime, titania and AC-DC. The latter was brought to a spectacular peak of performance by Navy use and inspection requirements. As will be explained in greater detail later, there is a good possibility of the AC-DC type displacing the titania type so that once again there will be only two types from which to choose: Lime and AC-DC.

Stainless steel electrodes must satisfy two fundamental requirements: Resistance to corrosion and mechanical properties. Corrosion resistance is a function of the chemistry of the weld deposit where the composition of the weld metal must equal or exceed the important elements in the parent metal being joined. Similarly the physical

properties of the weld must be adequate for service environments. The varying coating designs must recognize the ultimate demands on the weld metal by incorporating alloying materials to compensate for differences in arc losses.

Demands of both Army and Navy contributed measurably to the development of the stainless electrode family during the war. As a matter of fact, service needs constituted the principal reason for coating design improvements. For a long time, the Navy had specified and used a lime type stainless steel electrode showing a preference for this type of coating. In general, the vertical and overhead welding characteristics, an important feature for naval use, were better with the lime coating.

With a tremendously expanded program of tank manufacture, the Army required an analysis of weld metal using a lesser amount of critical alloys than the peacetime Navy electrodes. In many cases, the base metal thicknesses fabricated by the Army were less than those encountered by the Navy. Thinner sections made a better opportunity for an electrode with a leaner alloy content because the danger of cracking is lessened. Furthermore the tank builders were dealing with a structure much smaller than a ship which made possible an extensive use of welding posi-

tioners to spot the bulk of the welding in the downhand position. Thus the properties of a titania coated electrode appeared to be ideal for the tank program. The difference in welding assignments between Army and Navy work led to the adoption of one type by the Army and the other type by the Navy in a most natural as well as functional manner.

The growing scarcity of molybdenum, really the tremendously increased demand that outran the rapidly increasing supply, suggested a further modification in alloying content and the replacing of much of the molybdenum with manganese. At any rate, the so-called manganese modified stainless steel electrodes came into the picture for Navy applications on lighter work. These electrodes, again keeping in mind the vertical and overhead qualities associated with naval welding as well as a basic Navy preference for lime coatings, were made with a lime coating for the Navy and a lime or titania coating for the Army.

One more factor will be reviewed to complete the historical background surrounding the development of the three coating types now available. During the war, the WPB stressed the use of alternating current welding because ac units gobbled up less critical material than the dc welders. Co-operating in this effort, the Navy had to

Industry came out of the war with the AC-DC as the third basic or more stable titania type coating for stainless steel electrodes. The author thinks this type will replace the present titania coating, leaving the AC-DC and lime types to cover all requirements

have stainless steel electrodes with good ac welding characteristics. This meant combining the stringent mechanical property requirements with good welding performance in all positions. Many electrode designers worked on the problem, some of them becoming prematurely gray as a result. But after many trials and a tremendous amount of work, satisfactory AC coatings were evolved. Further, to permit maximum flexibility in naval stores, the designers achieved the ultimate goal by supplying AC-DC coatings which the naval activities could use with either ac or dc power sources. In this fashion, wartime research improved the welding performance of all stainless steel coatings besides bringing a distinctly new coating into the commercial field.

Lime and titania coatings, as may be seen in the Welding Handbook for 1942, were known before the war. The all mineral coatings had been developed to provide the basic slag needed for sound welds with stainless steels. Calcium carbonate supplied the alkalinity along with other calcium compounds and contributed the lime name to the lime type coatings. Similar basic coatings to which titanium materials had been added for increased arc stability became known as titania coatings.

Lime coatings proved to be less oxidizing than the ti-

Fig. 1—Horizontal fillet weld on $\frac{3}{8}$ -in. tee section

Fig. 2—Groove weld in $\frac{1}{2}$ -in. plate with a 45 degree over-all bevel

Fig. 3—Typical porosity caused by slightly wet coatings

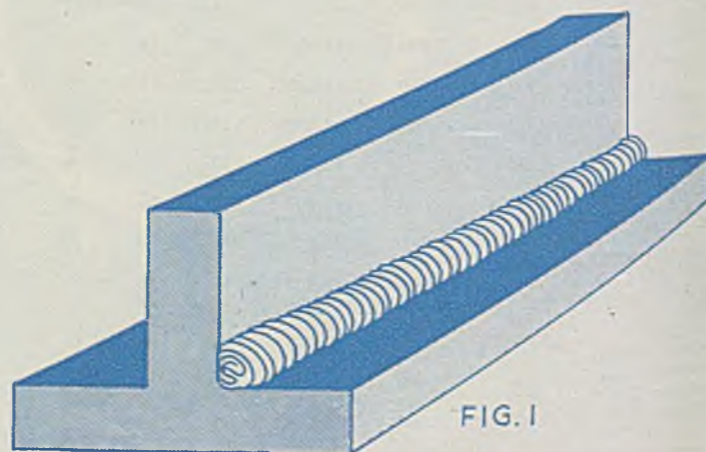


FIG. 1

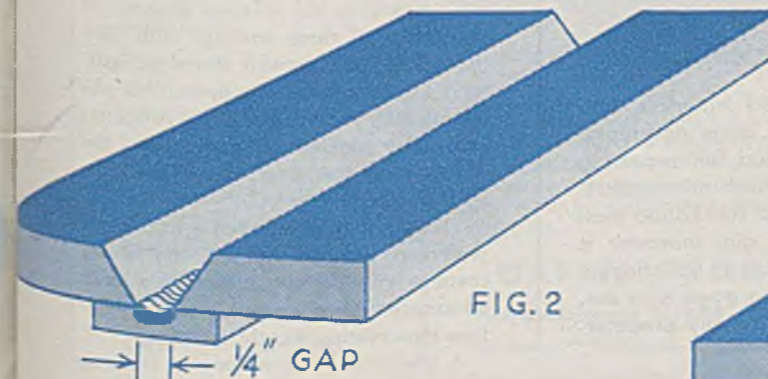


FIG. 2

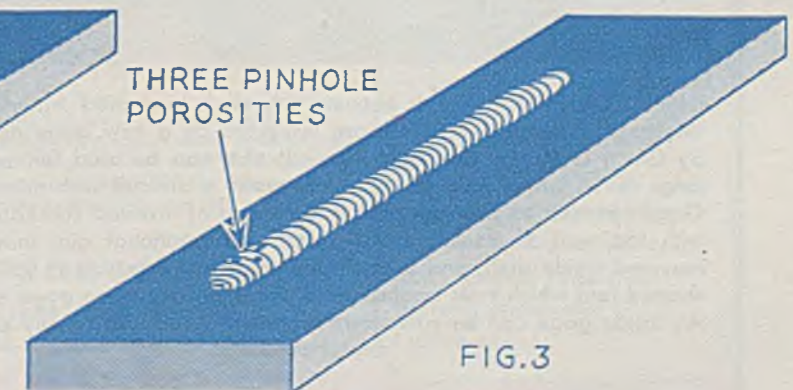


FIG. 3

titania coatings. Chromium and columbium transfers from the electrode to the weld metal displayed higher efficiencies when lime coated electrodes were used. However, the less efficient alloy transfer of the titania coated electrodes was rectified by adding ferrochromium or ferrocolumbium to the coating as one method. Another approach was the selection of core wires with sufficiently high chromium and columbium to guarantee enough of these elements in the deposited metal. Other ferroalloys of manganese or silicon were added when necessary to secure deoxidation of the liquid steel and to balance the deposit chemistry to secure the utmost in corrosion resistance together with well balanced mechanical properties.

Perhaps it would be in order here to emphasize the eminently satisfactory weld metal from titania or AC-DC type electrodes. Sometimes the greater oxidizing power of these coatings has been overstressed until some fabricators overlook these coatings, thereby losing definite advantages. Remember, the loss of essential elements has been corrected through the selection of a richer alloy concentration in the core or through the addition of restorative compounds in the coating.

Even with the greatly improved weldability of the titania and AC-DC coatings, there is some welder preference for the lime type in vertical welding. Whether this preference is due to greater experience or to fundamental weld metal

properties is difficult to appraise at this time. The first pass in a vertical fillet weld tends to be less convex with the lime type electrodes than with the titania or AC-DC designs. Welders who have gained sufficient experience with the latter varieties can lay in a root bead with a minimum of convexity. Manipulative techniques are difficult to describe, but consist in the main of paying major attention to the sides of the fillet or groove permitting the weld metal to bridge across. Working in an inverted V pattern facilitates melting and improves penetration at the point where the plates join each other in a fillet or a backing strip in a groove weld. Manipulating the arc from side to side builds up the weld.

To compare the welding performance of the three types of coatings, a horizontal fillet weld was made with each to get the welders' reactions. The weld is illustrated in Fig. 1 while the pertinent data is given below:

$\frac{1}{8}$ x 14 in. electrode	Lime	Titania	AC-DC
Best current	140A 21V	180A 23V	185A 20V

In all data, A indicates amperes and V indicates volts. The welds were made with direct current, reverse polarity because the lime and titania coatings are designed for this current-polarity while the AC-DC coating works well either with alternating current or with direct current, reverse polarity; 19-9 electrodes were used.

The data discloses the need for a higher

current with the titania and AC-DC coatings. Incidentally, these tests were made with a specific brand considered to be representative of the coating types although specific differences of a minor nature might be found with other conceptions of coating formulae. Likewise, trained welders, experienced in the application of these electrodes, were chosen to gain the best information on welder reaction to electrode performance.

Five yardsticks were used to measure the performance of the different electrodes: Arc stability, smoothness of bead, flatness of bead, slag removal and spatter.

Arc Stability—First choice for arc stability was the AC-DC coating, with the titania type a close second and the lime type coming in third by a noticeable margin. This rating is not at all unusual. Welders always preferred a titania coating for arc action, and the newer AC-DC coating is simply a titania type with even better arc stability. This rating must not be construed to suggest an absence of arc stability with the lime type coating. Rather the preference for titania types is something that appeals to the welders' senses.

Smoothness of Bead — AC-DC weld metal gave the smoothest bead judged by the fine evenly-spaced ripples, with titania weld metal almost as good. The choice here was difficult. Characteristically, the slightly less fluid lime deposit showed greater spacing between ripples. All three beads were uniform as to width and contour throughout the length of the bead.

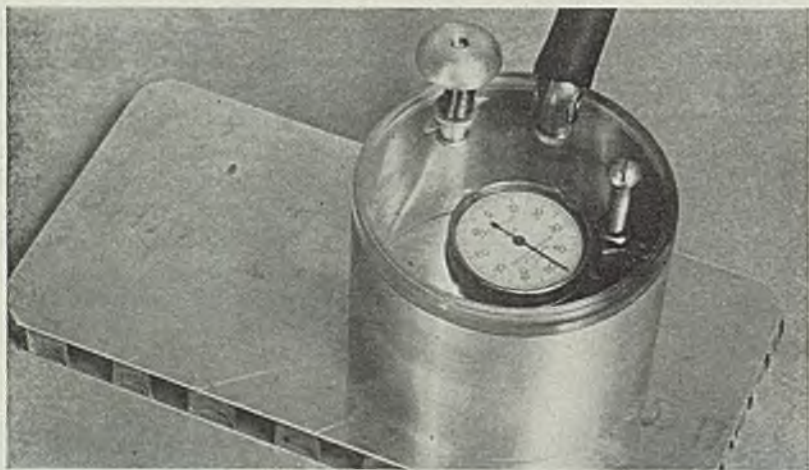
Flatness of Bead—AC-DC and titania types produced the flattest beads, with the AC-DC electrode maintaining a slight margin. There was a noticeable convexity with the lime type bead although this slight bulge would not be considered objectionable.

Slag Removal — All welds were permitted to cool before the slag was removed with hand tools. AC-DC slag was the easiest to remove. Lime type slag was second and titania type slag was third. Slag removal in the horizontal fillet position was quite good for all three types.

Spatter — No choice could be made with regard to the relative amounts of spatter as all three coatings with 19-9 (type 308) cores showed almost no spatter. Deposition tests support this observation by reporting a negative spatter loss. The pick-up of alloys from the coating more than overbalances the spatter loss.

This set of welds showed a unanimous preference for the AC-DC and titania coatings with the former holding a small advantage. Based on welder appeal, the lime type coating was third choice.

A similar series of welds was made in
(Please turn to Page 148)



INSPECTOR'S AID: Bonds between layers of laminated materials, and thickness of metal sheet stock are inspected by a new gage developed by Glenn L. Martin Co., Baltimore. It also can be used for inspecting large sheets where measuring central areas is difficult with micrometers. Gage operates on pressure principle, consists of inverted cupshaped shell with top wall of transparent material. Conventional dial indicator is mounted inside shell, and is equipped with stem reaching to spherically-shaped foot which rests against metal sheet surface when gage is in use. Air inside gage can be withdrawn or pressure reduced to any predetermined amount



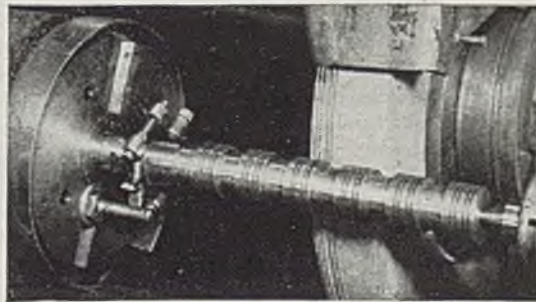
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4. Extends tool life
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6. Production at rated capacity of machine
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8. Resistance to rancidity
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11. Keeps supply lines clean



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8. Quick settling out action
9. Keeps supply lines clean
10. High dilution ratio
11. Economical

rends in COAL CHEMICAL RESEARCH

Three methods of aggressive and organized research are suggested for strengthening the position of coal chemical industry. Coke oven operator must decide whether to make ammonium sulphate or ammonia liquors in view of changing conditions. New refining and reforming processes applicable to tar chemicals should prove useful tools

By P. J. WILSON, Jr.*

COAL chemical industries are leading chemical industries. Their products are used widely in many chemical processes, particularly in fertilizers and in the manufacture of synthetic rubber and plastics. They are competing with the products of other industries, such as the synthetic nitrogen industry and the petroleum industry. With the war over, it appears wise at this time to ask ourselves what condition we face and what can be done to improve or at least maintain the position of the coal chemical industry.

The by-product coking industry which produces the coal chemicals is one of the earliest examples of the results to be expected from the application of sound technical knowledge and ability on chemical industry. When by-product coking was established in the United States about 50 years ago, there was practically no organic chemical industry of any kind, and little knowledge of chemical engineering principles. Engineers and chemists of the early years worked well, however, and during the first World War the by-product coking industry was firmly established. With products from coke plants they were able to satisfy requirements for munitions essential to the conduct of the war. Performance of the industry was a spectacular demonstration of the conversion of materials into useful products which would yield a profit. Methods developed were efficient and there has been practically no basic change in them since that time regarding the treatment of the gas and recovery of the coal chemicals. Some new processes have been developed, it is true, particularly processes for conditioning the gas, such as the hydrogen sulphide removal process.

Since the first World War a broad expansion in the number of by-product coke plants and the volumes of their products has taken place. The tar refining also has broadened. In addition to the

creosote, roofing and road tars and other relatively crude fractions, the refiners developed the recovery of tar acids, naphthalene, and pyridine bases, and began to recover a number of other tar compounds. The plastic industries consume increasingly large amounts of benzol, naphthalene, and other coal chemicals.

Can the present large proportion of tar refined be maintained in the postwar years? And can the position of tar refining be bettered? The answers to these questions depend on how well it is possible to maintain markets for the various products, both crude and refined, from tar. It is not practical to distill tar for recovery of a single product alone. The larger the number of products and the greater the diversity in their applications the smaller will be the effects of technological changes and competition from other industries on tar refining.

Results in Marked Effects

Markets for tar chemicals have largely been created by technological developments made by manufacturers outside the coal chemical field, effects of these developments on the consumption of tar chemicals have been most strikingly illustrated in the field of plastics. Development of the phenol-formaldehyde resins, which really got under way about 1920, led to a broad expansion in the recovery of the various tar acids from tar, and to the synthesis of phenol from benzene.

At present the coal chemical industry can help to strengthen its position by aggressive and organized research along the following lines:

1. Development of new or improved methods for recovery of individual pro-

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ducts from the tar at lower costs and more efficiently.

2. Increase in the qualities of existing tar products.

3. Development of uses for the tar compounds or fractions, either new and broader applications for the products themselves, or synthesis from them of derivatives which can find application.

Among the many problems which the tar offers, recovery of naphthalene is particularly important at this time. It is usually recovered from the tar distillate by a crystallization process, and the crude product refined by distillation, hot pressing, acid washing, or some combination of such treatments. Several grades are produced, each crystallizing in a different temperature range. The tendency of all products is to increase the purity or quality. The impurities in a chemical represent material which is not only useless to the purchaser, but often proves injurious by causing undesirable side reactions, thus interfering with a process.

In the case of naphthalene little is known about the impurities which are present. Each plant has developed a procedure which meets its needs. It appears, however, that some fundamental work on the recovery of naphthalene would be helpful in increasing yields and quality and in lowering costs.

Interest in higher phenols and phenol homologs is active. One petroleum refiner has recently devised a method for separating the isomeric cresols by first converting them to butyl phenols. The latter are then separated by distillation, and finally changed back to the original but pure cresols. This sort of thing the coal chemical industries could well be doing for themselves.

In the work on tar chemicals attention should be given to the new refining and reforming processes which have come to the front so rapidly during the war. Extractive and azeotropic distillation, hydro-

10 to 15 Times Greater Die Life--- Drawing Steel Lamp Sockets



Sockets are formed on a 9-plunger press from cold rolled steel, .034" thick. Stock is pre-zinc coated; coating acts as a lubricant and helps insure a final finish which will require little or no buffing or polishing.

One job currently running at Advance Stamping Company, Detroit, is the production of sockets for a brand-new type electric lamp.

Eight Carboloy Sheet Metal Dies cup and progressively draw these cold rolled steel sockets, from stock to finished part at the rate of one every 12 seconds.

N. J. Nolan, Vice-President of Advance Stamping Company, says this about the Carboloy Dies on this job:

"... all draw dies are made with Carboloy Cemented Carbide Inserts as we have found that in the production of some of our War items, die life, over our best drawing quality die steel, is increased from ten to fifteen times. *There is a much greater saving than just the increased die life as it reduces our downtime in production, resulting in greater production per day.*"

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genation, oxidation, reforming, and other methods should prove useful tools.

In this discussion of the individual tar compounds the remaining 80 per cent of the tar has not been forgotten. Although it is marketed in the form of more or less crude mixtures, the latter can be rendered more uniform in quality or modified to suit specific demands. There is always room for work in the fields of coal tar oils, creosote, and pitch to increase the values and extend the applications of these fractions.

In the case of the light oil itself, the most important problems are the utilization of the benzol, toluol, and xylol. There is a steady trend towards higher quality in the benzol homologs. Larger proportions of 1° benzol, instead of the 2° grade, which was the standard quality of pure benzol prior to the war, are being made. Interest has increased in thiophene-free and in low-paraffin benzols. Although several methods for reducing thiophene have been disclosed, none has won general acceptance.

There are further possibilities for separating pure compounds from the light oil. A good process for separating the isomeric xylols would tend to increase their range of usefulness. Cyclopentadiene is now being recovered from the forerunnings, and the demand for this chemical should increase due to its many versatile uses.

Operators Face Problem

One of the big problems facing the coke plant operator is what to do with ammonia. In addition to the ammonium sulphate from coke plants large amounts are produced from synthetic ammonia. Formerly the price of nitrogen in ammonium sulphate was largely determined by the price set for the nitrogen in sodium nitrate or "Chili saltpeter." The development of the synthetic nitrogen industry, however, has greatly reduced the price of all nitrogen products. Prior to the war the synthetic nitrogen utilized by the fertilizer industry went mainly into the ammoniation of superphosphate, and the production of ammonium sulphate and sodium nitrate. Lesser amounts were consumed in the production of ammonium nitrate, calcium nitrate and urea-ammonia solutions. Due to demand for fertilizer materials to meet wartime food requirements the utilization of newer and more concentrated fertilizers has received a strong impetus. The higher concentrations in plant food mean lower handling and shipping costs. On the other hand, more care on the part of the farmers is required in their application in order to avoid wastage and injury to the crops. This factor should not prove a disadvantage as the farmers become accustomed to their use.

In the face of this competition what

in the coke oven operator to do? Shall he still make ammonium sulphate? Shall he return to the early product of the industry, ammonia liquors? Or shall he leave as much ammonia as possible in the gas and destroy the balance. The only recourse appears to be to study recovery methods, both existing and proposed, as critically as possible in an effort to improve the costs. Recovery of the ammonia in a form which can be converted to different products such as ammonium sulphate or ammonia liquors, to suit market demands may help the situation somewhat.

After coke oven gas has been deben-

"Sea-Going" Tail Wheel

War-tested on Navy carrier-based planes, the Grizzly Tread-Lock wheel, adapted for industrial use, now is available for dollies and similar trucks, according to Thermoid-Grizzly Wheel Sales Division, Thermoid Co., Chicago. Its



patented feature of sealed-in lubrication ensures proper lubrication for sealed bearings.

Breather holes in the casting allow the rubber of the wheel to expand under pressure and contract when pressure is removed. Cut resistant tread is tough, will not pull apart, chunk off or cut surfaces.

Wheel shown in cross section in accompanying illustration is available in sizes of 6, 8, 10 and 12-inches.

zolized, the gas contains small amounts of hydrogen cyanide, organic sulphur compounds, principally carbon disulphide, pyridine bases; naphthalene; nitric oxide and resin-forming compounds; traces of ammonia and water vapor. Some of these compounds are objectionable in gas distributed for domestic and some industrial uses, so that their removal is imperative. The gas conditioning processes now employed embrace not only removal of hydrogen sulphide and hydrogen cyanide, but also naphthalene, nitric oxide and gums, and water vapor.

Of these compounds the hydrogen sulphide, hydrogen cyanide, and naphthalene have value when recovered in a suitably concentrated form. Interest in removal of sulphur from coke oven gas for industrial use is increasing, due both to the increas-

ing concentrations in the gas from the higher sulphur coals now being coked and to recognition of the advantages which are possible by using low-sulphur gas. In domestic gas the trend is towards reducing sulphur compounds still lower than at present. By eliminating sulphur compounds, difficulties due to corrosion are minimized. Hydrogen cyanide contributes to corrosion in mains and appliances, so its removal is also desirable. Most of it is removed in the liquid purification process, but only in one process has it been possible to recover the hydrogen cyanide readily as sodium cyanide. Due to the value and the good market for cyanides, interest in methods for their recovery is increasing.

Most of the naphthalene in coke oven gas is removed with the light oil and can be recovered in these operations. Separate installations for removal of naphthalene from gas are not common in coke plants.

The pyridine bases are one of the most recent groups of coal chemicals to be recovered from coke oven gas. The concentration is low, about 0.008 to 0.01-lb per 1000 cu ft of gas before the saturators. Recovery of these bases, as a by-product of the sulphate process, has proved profitable. Their removal does not appreciably affect the quality of the gas. So far, principal demands have been for the bases boiling up to about 145° C.

European Practice Differs

Further separation of the coke oven gas into the major constituents, hydrogen, methane, the paraffins, and the olefins has not been practiced in the United States to the same extent that it has in Europe. In a number of European plants purified coke oven gas has been separated into these fractions by progressive liquefaction and fractionation. The hydrogen has been used for synthesis of ammonia, methanol, and other compounds, for hydrogenation of organic substances. The olefins can be used for synthesis of various important organic chemicals such as ethanol, as well as for a fuel. The paraffin fraction forms a high heating value gas which can be distributed or liquified for distribution in cylinders.

The process is of interest, not only as a source of supply of the hydrogen olefins, and methane, but also as a potential means for radically improving the coal chemical recovery processes. Production of hydrogen in the United States is reported to be about 5 billion cu ft per month. Of this, about 3 billion cu ft are produced and utilized in the production of synthetic ammonia. Plants coking a total of about 30,000 tons of coal a day would produce these quanti-

(Please turn to Page 129)

you wouldn't

**burden a horse with more
than he could carry**



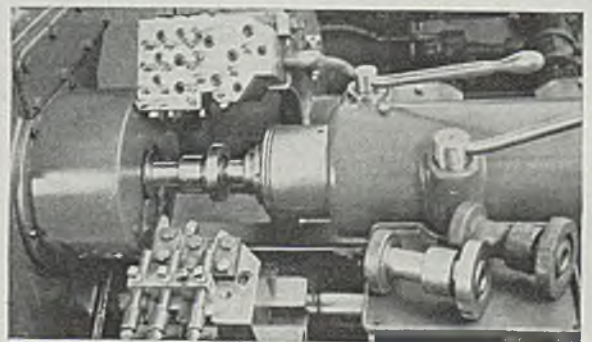
Nor should you put carbide cutting tools on a lathe lacking the fundamental rigidity for their most efficient use. Carbide cutting tools have increased horsepower requirements up to 300 per cent. They have increased cutting speeds 200 to 500 per cent.

Our jobs, our earnings and profits as well, will depend upon low cost production in the terrific competition to come. The most modern machines and methods must be used.

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45 to 50 horsepower is required to rough turn and face these automobile transmission cluster gears, at the high surface speeds required by carbide cutting tools—this is approximately three times the horsepower needed with high speed steel cutting tools. Fay Automatic Lathes are designed for the most efficient use of carbide cutting tools.



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TUNGSTEN CARBIDE TOOLS

Increased productivity and efficiency resulting from adoption of tungsten carbide tools brings tribute from men of the British machine shops. Widespread use predicted

TUNGSTEN carbide tools will cut steels of all specifications and tensile strengths, in the bar, as forgings or as castings. They also are being used successfully for machining cast iron, bronze, light alloys, copper, insulating materials, carbon, brick, stone, masonry, glass, porcelain, slate, hardwood, plywood, rubber, etc. But for success the tools must be properly applied, and care must be taken to observe certain simple precautions made necessary by their special characteristics.

It is most important to select the appropriate grade of tungsten carbide for

the particular job in hand. In section the shank of the tool should be as deep as the tool holder will permit, without bringing the cutting edge above the center line of the workpiece. The tool should be supported as rigidly as possible with the minimum overhang. When overhang is excessive there is a tendency to "chatter" and this is apt to cause chipping of the tip. An overhang of not more than half the depth of the shank is a general recommendation.

Where possible, tools should present a straight face to the work, inclining towards the direction of feed (Fig. 1) thus

bringing a longer cutting edge into play, for the same depth of cut, than would the knife shaped tool shown on the right in Fig. 2. This distributes the load, and the width on the cut (Fig. 3, right) is less than with a straight tool (Fig. 3, left) for a given feed.

A large radius (Fig. 3, left) should be avoided, since it causes an excessive wedging action in cutting. A radius of 1/32-in. is generally sufficient.

Shock at entry should be avoided by insuring that the tool takes up the cut gradually, as shown in Fig. 2 (left), although an exception usually has to be

POINTS TO WATCH WHEN CUTTING

Cutting Edge Chips:

1. Feed may be too coarse.
2. Speed may be too slow.
3. Coolant may be insufficient.

Cutting Edge Wears Rapidly:

1. Feed may be too fine.
2. Speed may be excessive.
3. Relief angles may be too small
4. Nose radius may be too large.

Tool Chatters:

1. Check tool overhang.
2. Check work support.
3. Nose radius may be too large.
4. Feed may be too light.
5. Tool may need regrinding (a point often overlooked).

Finish Is Unsatisfactory:

1. Try increasing the speed.
2. Try using SMALLER nose radius.

Fig. 1—A good tool form for heavy cuts

Fig. 2—Tool at left takes up cut more gradually than knife shaped one at right

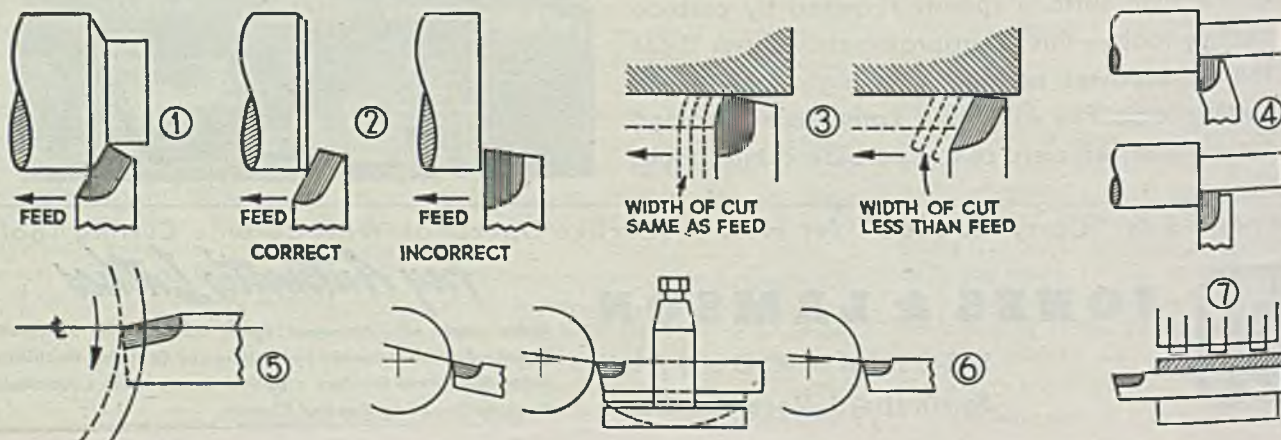
Fig. 3—Large radius (left) should be avoided. Load on tool can be eased by adopting the form at right

Fig. 4—A knife shaped tool (below) is best for thin shafts. Bent shank tools (above) are less rigid than those with straight shanks

Fig. 5—A negative front-to-back rake gives strength for heavy cuts

Fig. 6—When rake and clearance angles are small—as is common on tungsten carbide tools—avoid tilting in holder

Fig. 7—A steel strip is used here to protect the shank from set screw damage. Photos and data from British Information Service

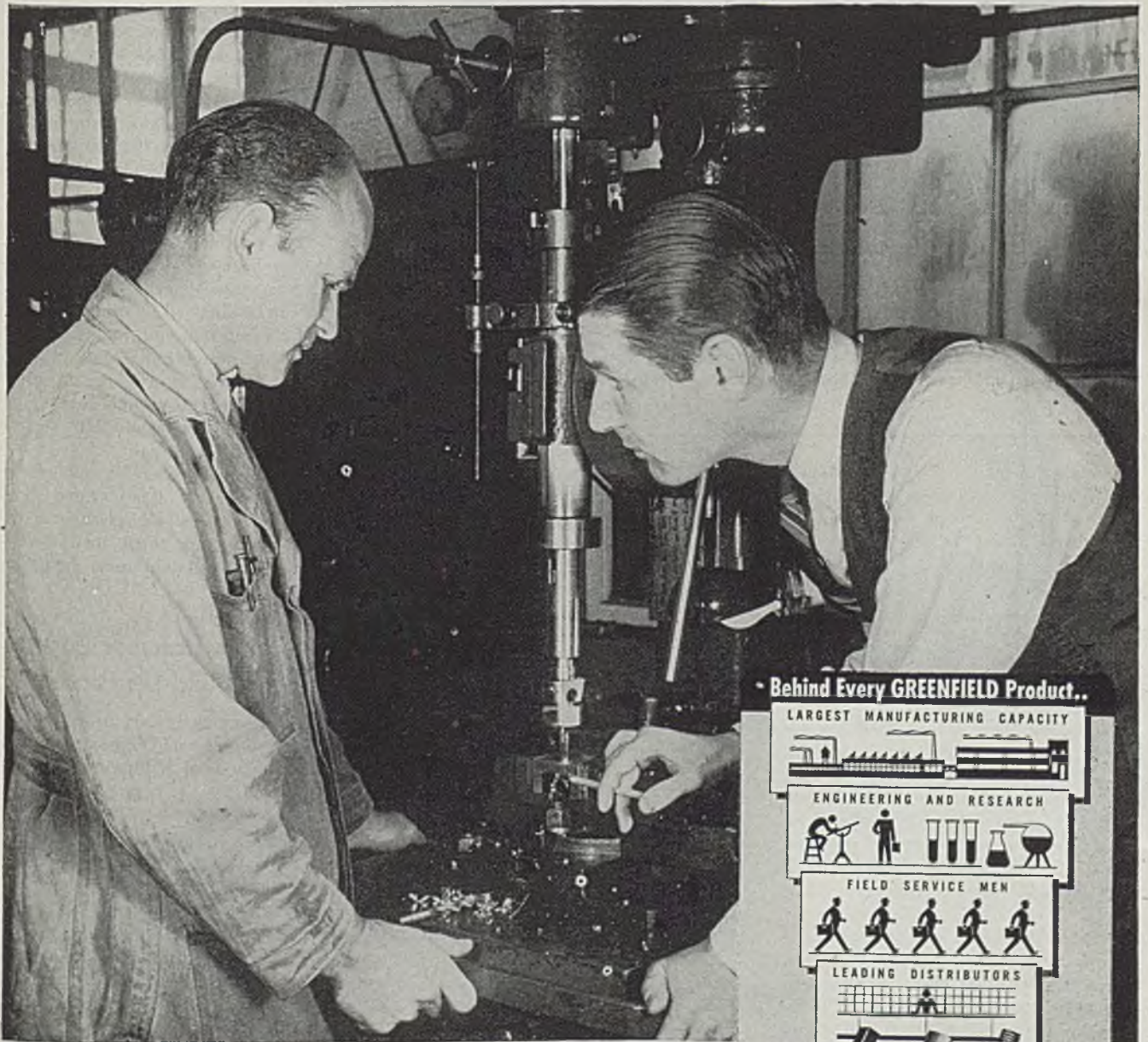


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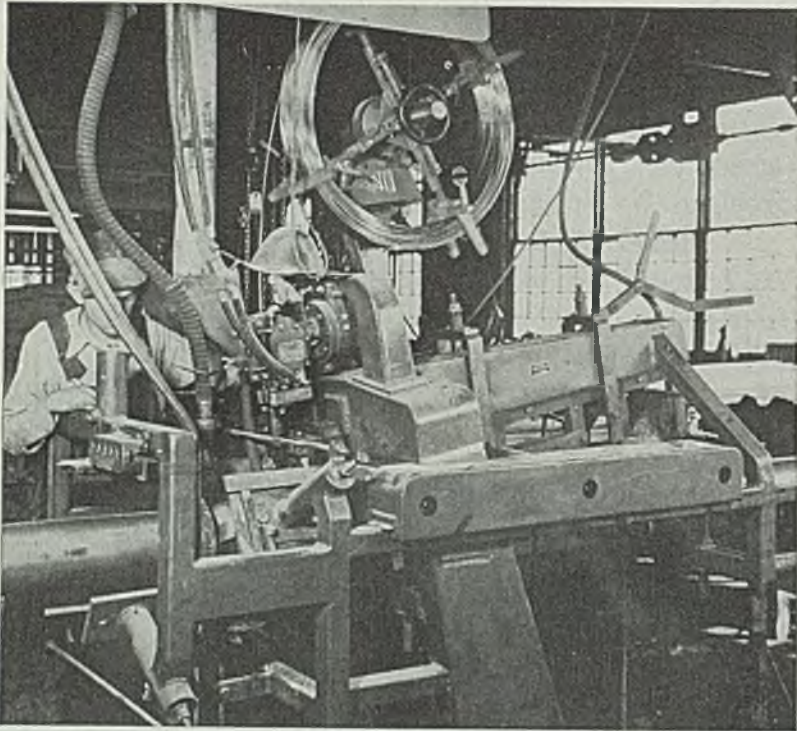
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WELDING INSTALLATION: This automatic pipe-welding head, mounted in a continuous tube mill, is shown welding 12-gage steel pipe at a speed of 70 ipm. Rolled sheet forms are fed into one end of the mill and come out cleanly welded and ready for painting at the other end. Granular material used in the process protects the welded area from harmful oxidation during welding. Process is carried on without flash, smoke, or sparks. This is a Unionmelt installation of Linde Air Products Co., unit of Union Carbide and Carbon Corp., New York

made when turning a thin shaft to prevent whip and deflection of the shaft. It is advisable in that case to use a knife-shaped tool (Fig. 4), thus keeping the main cutting pressure parallel to the length of the job.

A tool with a straight shank is generally preferable to one with bent shank because the cutting edge is more closely in line with the clamping screws. The tool therefore is more rigidly supported, consequently there is less tendency toward springing which causes chatter. For strength and long tool life the top rake (side) and clearance angles should be kept to a minimum. Top rake of 8° is sufficient for most classes of roughing operations, although it may be increased from 12 to 15° for soft, free cutting materials.

When taking heavy cuts on rough castings or forgings, or on interrupted cuts, it is sometimes advisable to give the tool a negative front-to-back top rake (Fig. 5). Height of the tool should then be adjusted so that the middle of the cut is on center. Positive side top rake of 0 to 8° is recommended in conjunction with the negative front-to-back rake, depending on the particular job. Negative rake tends to increase the pressure between tool and work, which means that work must be

chucked or otherwise held more securely. Greater power is also required. Negative rake should, therefore, not be used unless it is absolutely essential.

The normal tool with positive top rake should always be set on center, since it will rub if set appreciably above center. On the other hand, there will be too much clearance and too little top rake if it is set below center. This trouble may also arise with a single-post "boat" type holder if the tool is not held horizontally in the holder. Fig. 6 (left) shows how a tool may be on center, but the tilt in the holder increases the top rake and reduces the clearance angle. The reverse applies for the diagram at right in Fig. 6. This effect is naturally more pronounced when using carbide tools, since the clearance and top rake angles are normally kept as small as possible.

It is an outstanding characteristic of carbide tools that they generally cut more efficiently at high speeds than low. A "rule-of-thumb" when machining low or medium tensile steel is to aim for 200 surface feet per minute or over for plain turning, with a feed sufficient to insure cutting rather than a rubbing action.

When several cuts are taken simultaneously on different diameters, speed selected should be such that for each

diameter the speed is within the range recommended on the maker's charts for the grade of carbide used. This rule should also be carefully observed when taking facing cuts where the speed varies during the traverse of the tool across the face. Feeds within the range 0.010 to 0.020-in. per revolution are generally recommended, depending on the nature of the job.

The tool should never be allowed to "dwell" at any point in the cut. No matter how hard a tool may be, this will inevitably dull its edge. It will also burnish and "work harden" the work piece, which may have a disastrous effect on tools used in later operations.

Depth of cut must depend largely, of course, upon the amount of stock to be removed. It is good practice to remove as much stock as possible with minimum number of cuts. Permissible depth of cut will, however, depend on the strength of the part to be machined, strength of the chuck or holding fixture, size and strength of the tool and its mounting, and power available.

For easy disposal, chips should be kept as short as possible. Continuous chips can frequently be avoided by increasing the feed. Alternatively, good "chipbreaking" results can be obtained by using a heavier flow of coolant, thus ensuring more rapid cooling which causes crumbling. In some instances, it may be necessary to grind a chip breaker groove into the tip of tool itself, but this should be avoided unless absolutely essential.

Coolant should either be applied in large volume or not at all. Application by brush or in occasional splashes on the hot carbide tip, are worse than useless and will almost certainly cause the tip to crack.

Drop-Forge Hammer Boards Made by Build-Up Process

Built-up hammer boards, called Weld-rock, for drop-forging equipment are being manufactured by Irwin Mfg. Co. Inc., Garland, Pa.

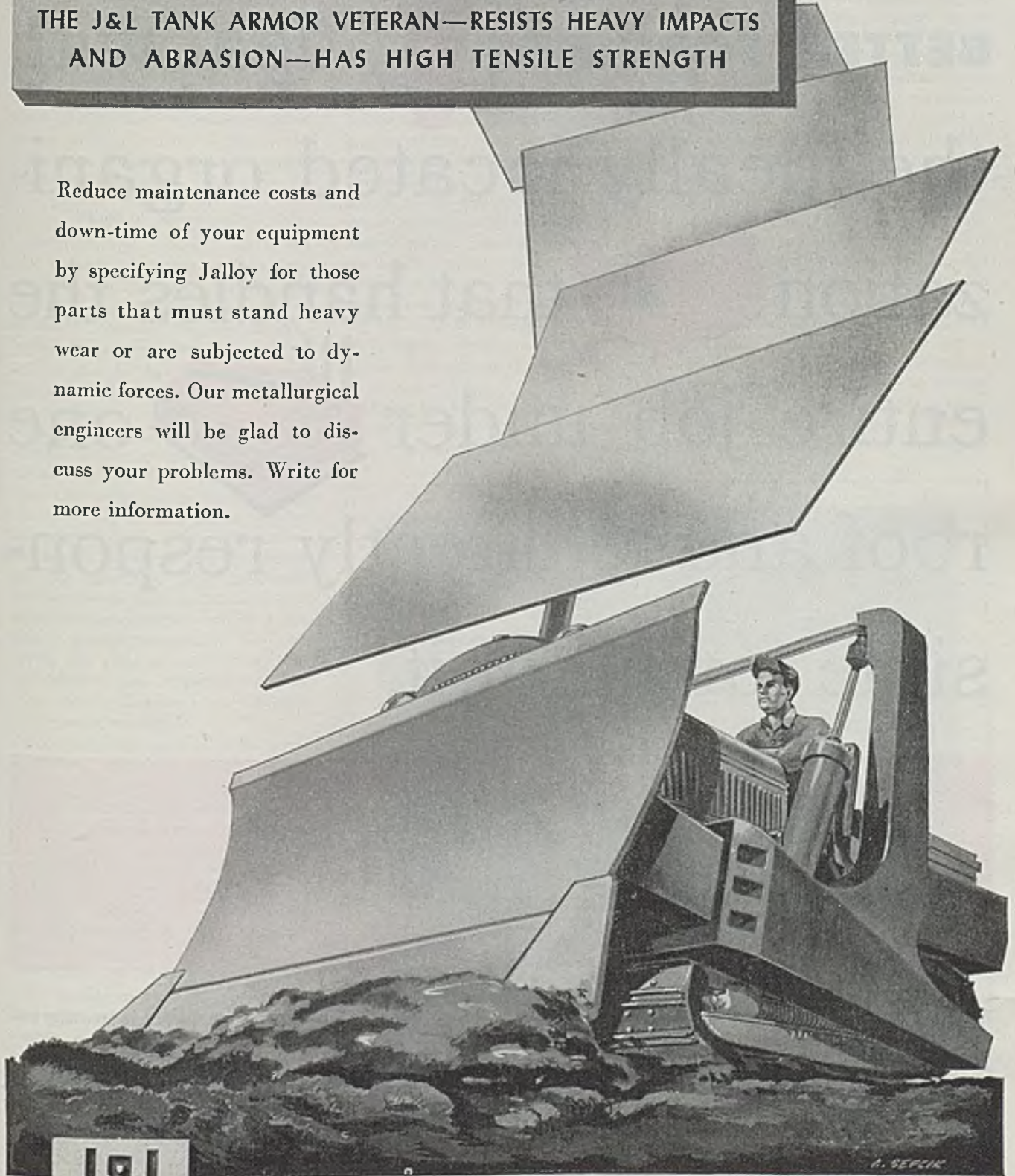
Three years ago this company was called upon to furnish $2\frac{1}{2}$ in. thick hammer boards for important war production. Because of a serious shortage of heavy hard maple the company began experiments with the built-up board. The chief obstacle was necessity of evolving a glue which would be moisture-resistant, of great tensile strength, able to withstand forge shop temperatures of at least 150° , and also be impervious to oils and greases. As a result of extensive experiments, such a glue was developed.

The first built-up boards produced were $2\frac{1}{2}$ in. thick, $6\frac{1}{2}$ in. wide and 15 ft long. They have proven useful for work with heavy hammers.


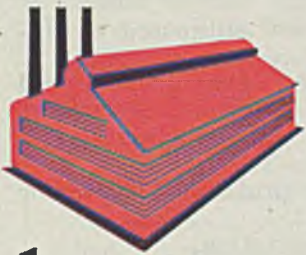
JALLOY

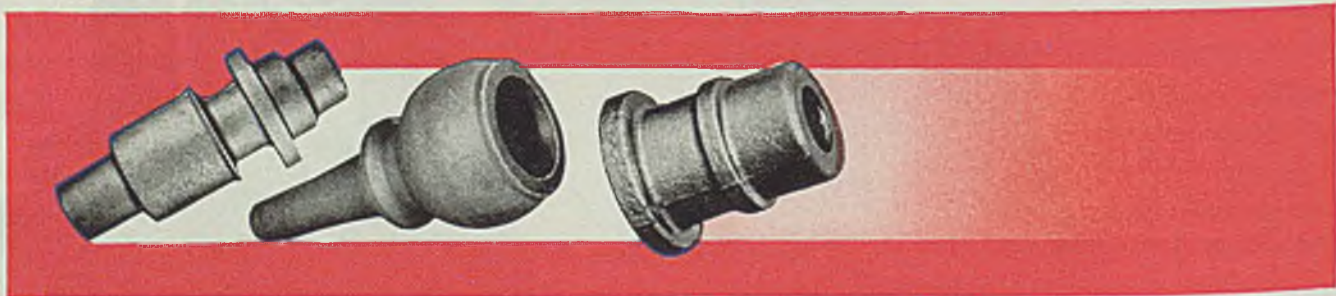
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Grease Lubricants

(Continued from Page 94)

to date, have limited their popularity.

Lead soap is used to a limited extent in the manufacture of greases. This soap increases the load carrying capacity and imparts corrosion-resistant properties to the finished product, but it does not materially "thicken" the oil. These properties make this soap suitable for use in gear lubricants but since the latter are not within the scope of this article, a discussion of lead soap base products is not included.

Method of Manufacture

Manufacture of greases is one of the most scientific operations performed by lubricant manufacturers because the amount of ingredients used are all very accurately controlled and the reactions involved are entirely chemical in nature.

Even though the rate of reaction, amount of ingredients and their purity are carefully controlled by modern weighing and measuring devices, and scientific laboratory control, a certain amount of "art" is required in the manufacture of greases to impart to them the exact texture and other physical properties desired. The greasemaker, for example, must know exactly when to add each ingredient. Some greases are very sensitive to small deviations in their manufacturing procedure and it is possible to produce two greases, both containing the same amount of each ingredient, but one satisfactory and the other not, by changing their manufacturing procedure slightly.

Basic procedures used in grease manufacture are relatively simple, and are fundamentally of two types: (1) Cooked and (2) cold mixed, or sett greases.

Practically all the greases on the market today are of the cooked type; these in turn may be split into two types, i.e., (a) those which are stirred in the kettle until they are practically cool then drawn into containers and, (b) those drawn into containers from the kettle above the melting point of the final grease.

Sett greases are more easily made than any other type. The procedure used consists in mixing the ingredients at room temperature, drawing the mixture into final containers immediately and allowing the reaction to take place in the containers.

Group No. 1 Calcium Soap Base or Cup Greases: There is definite evidence to show that a lubricant composed of fat and lime was used as early as 1400 BC on the wheels of chariots; however, it was not until about 1845 that lime soap was combined with mineral oil to form a grease. Today, greases in this group are widely used for line shafting,

water pumps, plain bearings, and all general applications where the temperature does not exceed 150° to 200° F, depending on the soap concentration. These greases are particularly desirable where water resistance is a factor since calcium soap is insoluble.

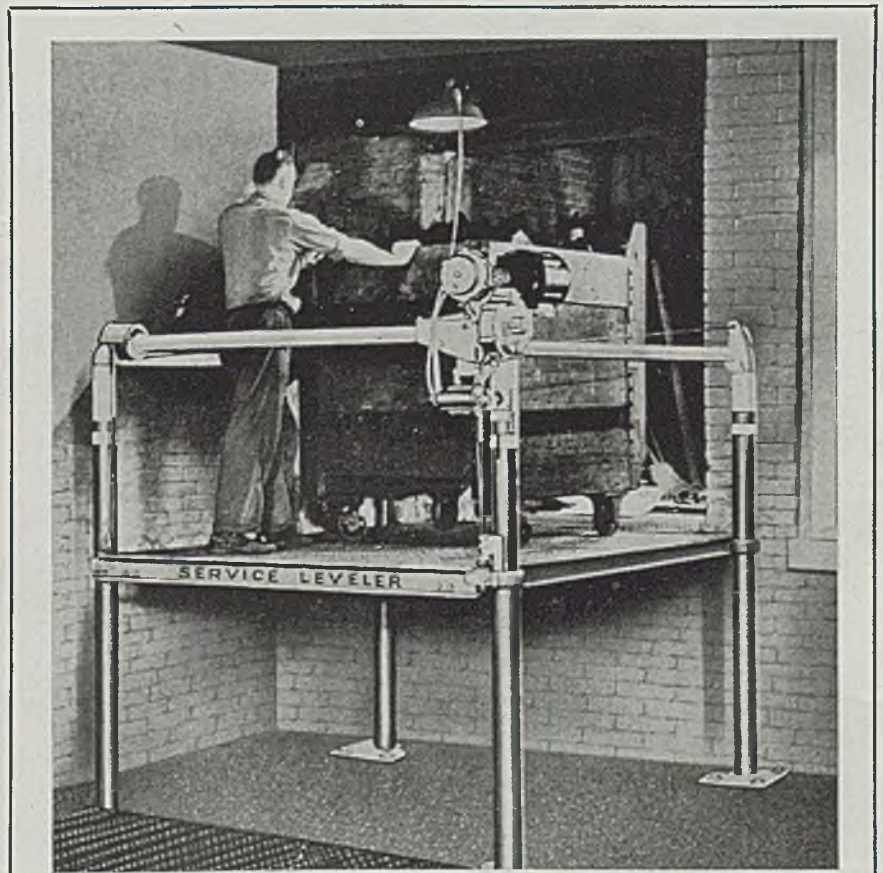
Calcium soap base greases can be and are made from a great variety of oils ranging in viscosity from light spindle oils to heavy cylinder oils. By varying the soap content they can be made in grades ranging from liquids to solid greases which can be cut with a knife. The viscosity of the oil used affects the texture of the finished product to some extent in that low viscosity oils give a buttery texture whereas, high viscosity oils tend to make a grease which is a little more stringy or sticky. Obviously, cup greases prepared from low viscosity oils are designed for light duty service, while higher viscosity oils are required in cup greases to meet heavy duty requirements.

One of the simplest methods of manufacturing cup grease consists of first adding a calculated amount of saponifiable

fat (or fatty acid) to a kettle. Next, the requisite amount of lime to be used is suspended in a quantity of water in a separate tank, mixed well, then added to the fat. During this and all subsequent steps, until the finished grease is drawn into containers, the mixture is constantly agitated.

After the lime suspension has been added to the fat, heat is applied to induce saponification, which progresses fairly rapidly at 212° F. At first a doughy mass is formed which gradually thickens as the water is evaporated off. When saponification nears completion, temperature of the mass may rise to around 275° F at which time the soap assumes an appearance of heavy syrup or taffy. It is at this point that the skill of the greasemaker begins to play an important part. His ability to judge from appearance and feel of the soap the time to begin adding oil is one of the important points which determines the success of manufacturing cup greases.

When the soap is judged properly cooked, oil addition is begun and is continued until such time as very nearly



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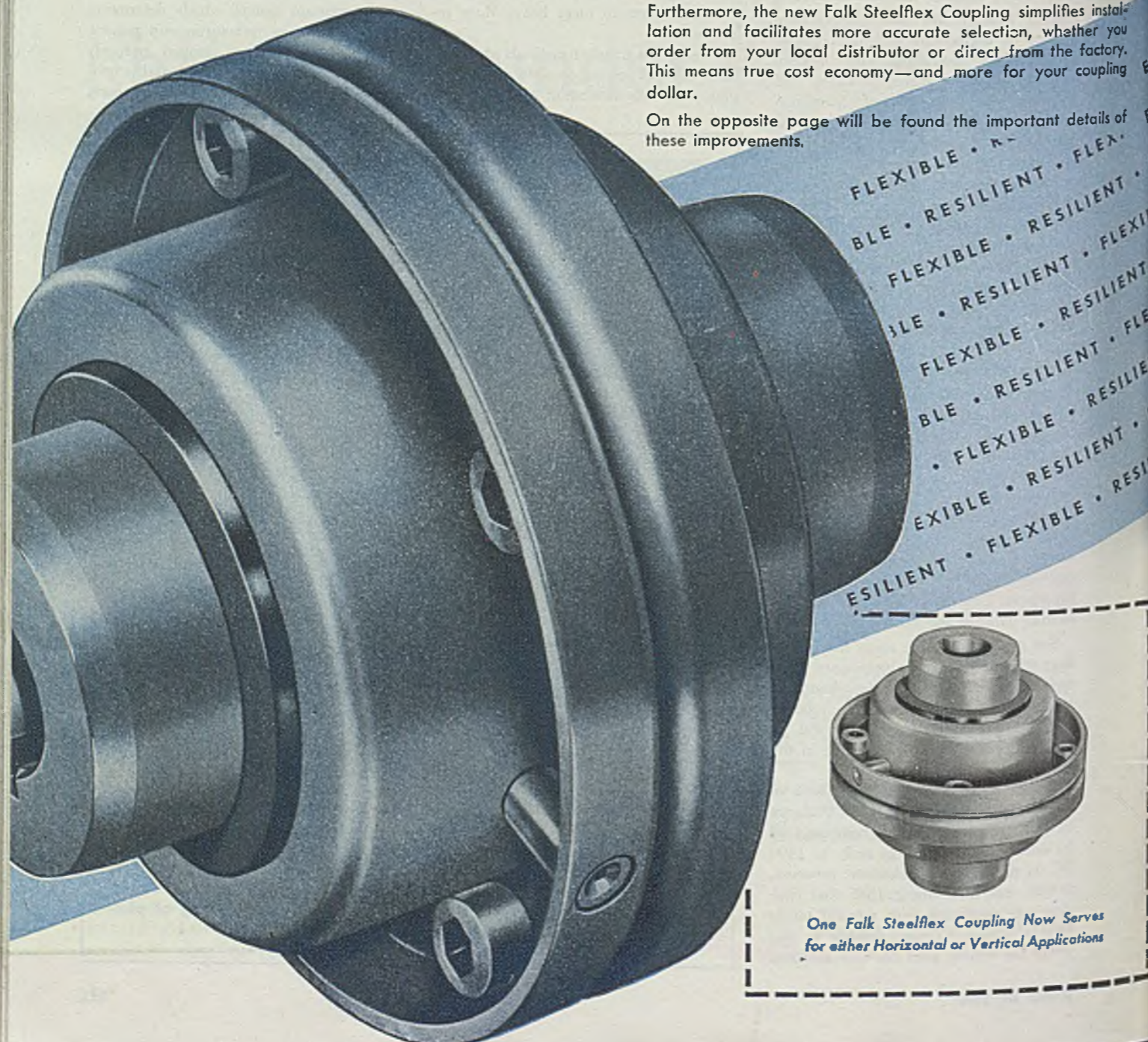
The New Improved Steelflex Coupling

is applicable to over 90% of all installations

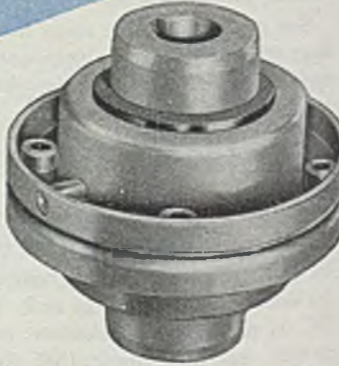
Falk engineers, after years of field experience and laboratory study, now present an improved coupling design that will meet over 90% of all installation requirements.

The new design Falk Steelflex Coupling is equally efficient in either vertical or horizontal applications. It has a new wide shoulder seal ring that keeps the cover in position, and provides added protection against dust, dirt, and loss of lubricant. Furthermore, the new Falk Steelflex Coupling simplifies installation and facilitates more accurate selection, whether you order from your local distributor or direct from the factory. This means true cost economy—and more for your coupling dollar.

On the opposite page will be found the important details of these improvements.



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In Addition to Falk Coupling Flexibility and Torsional Resilience YOU NOW GET ALL OF THESE EXCLUSIVE FALK FEATURES

1. **Resilient Grid Member**—Shock loads are reduced by deflection of the resilient steel grid member which connects the two hubs of the coupling. Vibration is dampened by a change in natural frequency which takes place in the coupling with the change in load; the action of pressing the grease between the hub teeth and the grid member.
2. **New Ease of Alignment**—The diameter of the coupling at the gap between two hubs is turned to a true cylinder—both hubs being exactly the same diameter. This feature makes it unnecessary to turn either the driving or driven shafts when aligning. Parallel alignment is checked quickly with the end of a straightedge across the two hubs and with a feeler gauge. Angular alignment is checked with spacer block and feelers in the gap between the hub faces.
3. **Misalignment Flexibility**—The raised portion of the teeth of the hubs on which the cover rides permits free articulation between the two hubs, the cover, and the grid member. This construction enables the coupling to compensate for angular or parallel shaft misalignment without placing harmful loads on the connecting shafts or their bearings.
4. **Floating Cover**—The two steel cover halves are identical and are provided with guard flanges to cover the capscrews and nuts which hold the half covers together. A gasket is used between the half cover faces to seal the grease inside the coupling. The cover floats on the top of the raised portion of the hub teeth.
5. **Seal Rings**—The openings between the cover and the hubs are sealed with Neoprene rings which are grease-resistant and therefore prevent loss of lubricant and entrance of water, dust, or other foreign material.
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the necessary amount has been added. At this point the mass has been cooled to below 200° F but is still sticky in appearance. When the batch is considered just right by the greasemaker, a predetermined amount of water is added and the batch almost immediately assumes the typical appearance of cup greases. After the water has been added and stirred in, a sample of the grease is sent to the laboratory for control tests. The water content of the batch may have to be adjusted in order to obtain proper compatibility of the soap and oil. If there is a deficiency, the grease will be grainy; if too much water is present it will be dull or milky in appearance.

Skill is also needed in judging the consistency of the batch. Hot and comparatively thin grease presents a problem to adjust the composition of the product so that after the batch is cooled in the final shipping containers, it will be "on test" for consistency. This is done by removing a sample of grease from the kettle, cooling to the proper temperature, and then determining its consistency by means of an instrument known as a penetrometer. If this test indicates the grease to be too hard, more oil is added and the above procedure is repeated until the grease is found to be "on test". After the batch is finished in the kettle, it is ready to be drawn into drums or smaller packages.

The foregoing procedure is fundamentally the same as that used by practically all manufacturers of this type of grease, but there are many variations which can be, and are used. For example, the time for saponification in the above procedure is at least 6 hr and varies to a great extent with the type of fat used. However, if a pressure kettle is used, complete saponification is

brought about much more rapidly.

A second variation often used is to add a portion of the mineral oil with the original charge. This prevents the soap from becoming too hard, particularly when fatty acids are used as the saponifiable ingredient, and materially reduces the power consumed in stirring. The order in which the ingredients are added also plays a major part in the final properties of a grease.

In addition to the foregoing procedures, there is one termed the "cold mixed" or "sett" process which is sometimes used. In this method, fatty acids in a portion of the oil are mixed with a slurry of hydrated lime and the balance of oil, the reaction being carried out at about 100° F. One disadvantage of this method, however, is that the reaction is not complete when the grease is drawn into packages, the balance taking place in the containers. Therefore, these greases may alter their appearance or change their consistency after being packaged. Greases made from rosin oil and manufactured by a process similar to this are used for certain types of application and are discussed below.

Group No. 2, Calcium Soap Base or Axle Grease: Calcium resinate (often termed lime rosin) soap base grease from the standpoint of composition could be considered cup greases for in this type rosin oil is used instead of one of the usual saponifiable fats incorporated in cup greases. Their method of manufacture and properties differ so radically from cup greases, however, that usually they are considered as a separate group. Rosin oil, incidentally, is a product made by distilling or otherwise processing pine rosins, it contains an appreciable amount of rosin acids.

Greases in this group are very easily

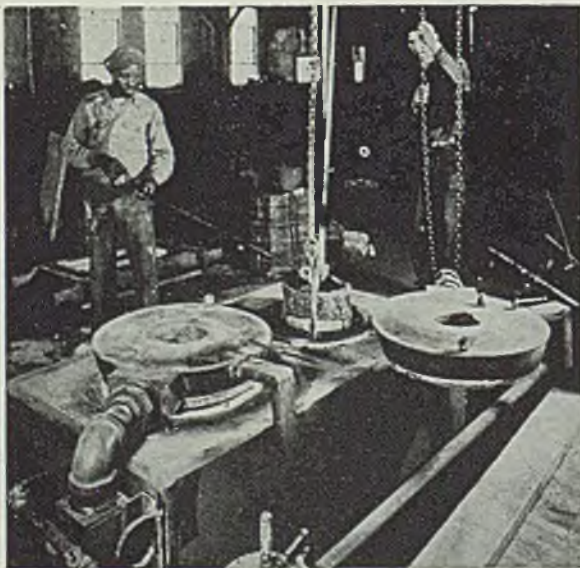
made, requiring no external source of heat to manufacture. They are often used where economy is of primary importance, or where it is necessary to use an excessive amount of grease to prevent dust and other foreign matter from entering bearings. Typical applications are: Rough heavy bearings in lumber or mining equipment, track curves and wagon axles.

The term "sett" is applied to this group of greases inasmuch as they are usually made by mixing the necessary ingredients in the cold then drawing the contents of the mixing kettle rapidly into containers. The reaction between the lime and rosin oil occurs very rapidly so that the mixture becomes solid or "setts" within several minutes after it has been mixed.

Ingredients used are mineral oil, rosin oil, lime and sometimes water. The rosin oil is mixed in the proper proportion with mineral oil, forming what is known as "compound". A second mixture consisting of an emulsion of hydrated lime and mineral oil, (in some cases water and a very small amount of rosin oil are incorporated) is made in a separate tank, this mixture being known as "sett". The "compound" and "sett" are agitated in a mixing tank in the proper proportions and poured at once into the final container.

Speed of the reaction depends particularly on the quality of the rosin oils used, for this reason they are usually purchased on the basis of strict specifications.

In order that the reaction between the lime and rosin oil can be carried out efficiently, it is necessary that the grease contain some water and also excess lime. The water serves as the medium in which to carry out saponification and



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the excess lime insures completeness of saponification. In the finished grease as much as 5 per cent water and 1 to 2 per cent excess lime may exist. The presence of water limits their application to bearings operating below 200° F.

Consistency of "sett" greases can be varied from semi-fluid products to hard brick type greases. The texture of these greases is somewhat similar to that of cup greases for they are smooth and buttery but are ordinarily more sticky and unctuous.

Group No. 3, Sodium Soap Base Greases, General: Sodium soap base greases are normally of two types, (1) those drawn from the kettle at temperatures below the melting point of the grease and, (2) those drawn in a molten stage, (the latter are described in the next section).

Greases of the first type are often termed "sponge grease." This name originated in the early days of grease manufacture when it was thought greases in this group actually resembled a sponge and soaked up the oil in a manner similar to a sponge soaking up water. This theory has since been found to be untrue since the structure is actually such that the oil cannot be squeezed out of the soap.

Characteristics which make this type of grease valuable as a lubricant are their high melting point (300° to 450° F) and their ability to remain in a bearing at high temperatures and pressures. Most sodium soaps are soluble in water, but whether or not greases made from sodium soaps can be used satisfactorily in the presence of moisture will be determined by other characteristics of the grease and the application itself. In some applications the solubility of the soap may be a decided advantage.

Procedure used in the manufacture of sponge type greases is essentially the same as that used in the production of cup greases. The kettle is first charged with a small amount of oil and the fat, which is then heated until it melts (if it is a solid at room temperature). Next a solution of caustic soda in water (sodium hydroxide) is added in a predetermined amount. The fat is quickly converted to sodium soap and then the contents of the kettle are gradually heated to about 300° F in order to complete saponification and to evaporate the water. At this point, the soap is firm, tough, spongy and has a tendency to agglomerate in masses about the stirring mechanism (See Fig. 3).

Here again the skill of the grease-maker contributes materially to the final nature of the finished grease, for it is at this point that the addition of oil is begun. Great care must be taken during the early stages of oil addition to prevent the formation of lumps in the grease. Addition of oil is continued until nearly all has been added, at which point the temperature will have dropped to about 200° F. The grease is then put "on test" in the same manner as for cup greases; that is, by removing a sample and running a control penetration, then adjusting the mineral oil content accordingly.

The fibrous nature of the final grease is mainly controlled by the type of fat or fatty acid used and the procedure of handling the grease in the kettle, particularly during the last stages. Fats, such as tallow, are ordinarily used to produce a grease with a fibrous texture. Fatty acids on the other hand result in a smoother textured product.

Although most unctuous sodium base greases on the market today are of a

fibrous nature, it is possible to make them almost as smooth and buttery as cup greases by milling or by the suitable choice of fatty material as mentioned above. Merely milling a fibrous grease to produce smoothness results in a product which is smooth in the container but which may revert back to a fibrous nature upon heating and working.

Cold sett sodium soap greases can be made in a manner similar to cold sett calcium soap base greases. This type is manufactured by merely mixing fat, oil and caustic solution in proper proportions at about 110° F then drawing the product while still liquid into containers where saponification takes place. Greases of this type are usually made with a high soap content and are, therefore, hard solid products. They can be used for rod cup driving journal lubrication of railroad locomotives, but since one of these ingredients is water, they should not be used above about 180° F. This type of grease is not extensively used at the present time but was very popular prior to 1915.

Group No. 4, Sodium Soap Base, Brick Greases: In discussing greases in the previous group, mention was made that this type is drawn from the kettle at temperatures well below the melting point of the grease. If heating is carried to a temperature sufficiently high to cause the soap to dissolve in the oil, and it is then drawn from the kettle, a smooth-textured product results upon cooling which is hard and firm for high soap contents. Lower soap contents result in a false bodied product which appears to be hard but softens readily upon working.

Ingredients used in the manufacture of soda brick greases depend upon the



PIPE FLANGE OPENER: Job of opening pipe flanges for removing gaskets is speeded, simplified by these Flange-Jacks made by T. G. Persson Co., 224 Glenwood avenue, Bloomfield, N. J. Jacks are capable of opening joints against a load of 15 tons without damage to flanges. As pressure is exerted, flanges open evenly, without shock and in continuous alignment. Closures are accomplished in similar manner. Jaws are heavy one-piece steel forgings with case-hardened screw points

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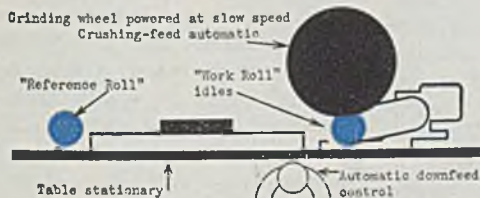
One of the major drawbacks to crush form grinding precision flat form contours has been the inability to produce on a practical production basis. This obstacle has been eliminated in two ways by the new Thompson Truforming Process.

First: Truform Grinders are engineered and built as a single unit, eliminating the failures of make-shift crushing arrangements and attachments.

Second: TWO CRUSHING ROLLS ARE USED. This is a major advancement, because it greatly extends crushing roll life and makes possible, for the first time, quantity production without constantly disturbing the set-up to re-process the crushing roll.

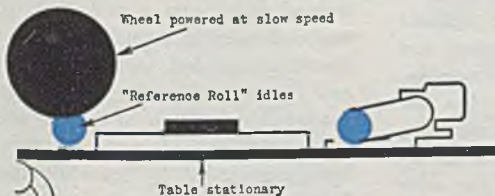
How two rolls operate in the Truforming Process is briefly illustrated and described below. The normal crushing or truing position is shown first.

Normal Crushing Position Also Truing or Dressing



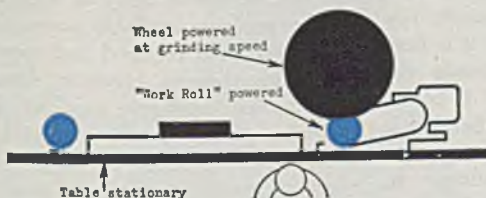
This is the position for the initial crushing of the wheel—and for subsequent truing or dressings when production grinding. On an eight pitch modified buttress thread form, 125 dressings were provided by the "work roll" before losing form.

Touching-up Position



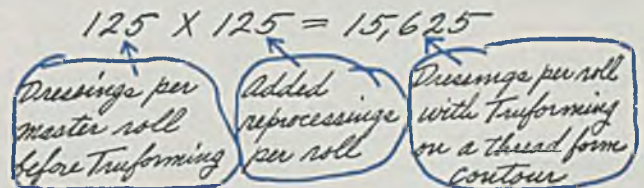
When the "work roll" loses form the table is moved to bring the grinding wheel over the "reference roll" for touching up, as shown above.

Re-processing Position



Because both rolls are table mounted, are in perfect alignment, and can be brought in the same relation to the grinding wheel, the original degree of accuracy can be quickly transferred from the "reference roll" back into the grinding wheel... and then ground back into the "work roll" as shown above.

The machine is then ready for production grinding again without disturbing the set-up or removing anything from the machine. In this way the "work roll" can be re-processed whenever it loses form and can be used for hundreds of additional dressings, or until it is worn out. Duplicate crushing rolls can be ground in the same way on all Thompson Truform Grinders.

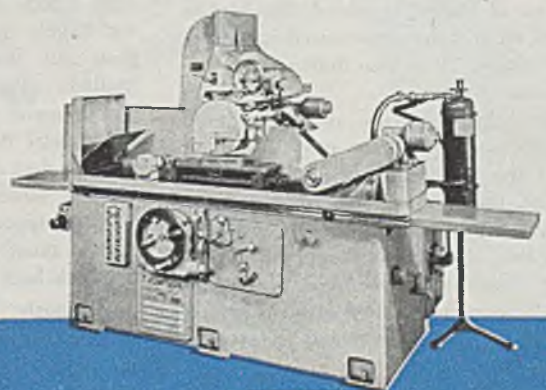


What this means in savings is illustrated by the following example, involving a modified buttress thread form with an eight pitch form. Where two rolls are used in the Thompson Truform Process, it was possible to get over 15,625 dressings from the "work roll" before it was worn out. This meant an increase in continuous production (without changing or disturbing set-up) of 12,500%.

Write for the new 8-page Truform Leaflet—"Why didn't you tell me about this process before?"

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type of product to be manufactured. Tallow is widely used as the fat; while rosin, degreas and other fatty materials also may be used. The mineral oils used in this type of grease depend upon the type of service for which the grease is intended. Since greases in this group are normally used for high temperature, heavy duty work, the oil incorporated in the grease is usually of a heavy grade, although some brick greases are made with much lower viscosity oils.

Soda brick greases are ordinarily manufactured to a definite soap concentration and hence no manipulation of the batch is necessary in order to put the grease "on test".

Brick greases find application in high temperature and heavy duty lubrication such as on journals of cement and paper mills, locomotives, etc. The grease is ordinarily applied in brick form directly on the journal.

Group No. 5, Aluminum Soap Base Greases: Greases in this group are almost invariably made by thickening mineral oil with aluminum stearate. This soap may be prepared in various ways; however, the most common is known as the double decomposition method. The fat, which must be largely, or completely, a stearate, is saponified with caustic soda. The resultant soap is maintained in a liquid state and a solution of alum is added; the alum combines with the sodium soap and forms aluminum stearate, which is insoluble in water. After washing the aluminum soap free of excess chemicals, it is dried.

Aluminum soap greases are made by charging aluminum stearate and a portion of the oil to a kettle, then heating until the soap melts and dissolves in the oil to form a clear mass. At this point the rest of the oil is added, the heat is turned off and the mass stirred until partially cooled. It is then drawn into cooling pans.

One difficulty with aluminum soap base greases is that the rate of cooling affects the finished products. If cooled too fast, they are crumbly; if cooled too slowly, they are too soft. In order to avoid this, the grease should be cooled under controlled conditions and then passed through a mixer (milled) which produces a smooth, glossy and transparent product.

Change of texture with variations in temperature is mainly responsible for the limited uses for products of this type on the market today. Unfortunately, when aluminum soap base greases are reheated, even very gently, their texture usually changes, and the extent to which they return to the proper usable state depends upon the rate of cooling and the amount of agitation while cooling. For these reasons, aluminum stearate greases are not usually

acceptable for bearings where the temperature is likely to reach 170° F, or above, even for short periods. These greases do, however, have a limited field of application because of their adhesive qualities and the fact that they are insoluble in water.

Group No. 6, Lithium Soap Base Greases: Lithium soap base greases are the latest and one of the most promising developments in the field of greases. They have the smooth appearance of cup greases, yet the high melting point of sodium base greases, also the soap is insoluble in water. During past emergency they were extensively used for the lubrication of aircraft control mechanisms, particularly at temperatures of 50° to 100° F below zero.

Several methods can be employed to manufacture lithium soap base greases; however, so much secrecy has surrounded their development, due primarily to the war that only one method is universally known.

In this method, the lithium stearate, a white powder, and about half the oil that will finally be in the finished grease are heated in a fire-heated or high pressure steam-heated kettle to about 400° F or slightly above. At this temperature the oil and soap become completely homogenous and almost transparent. The rest of the oil is then added and the heat turned off. The grease is stirred until it has cooled to the point found best for the particular mineral oil component and at this point agitation is stopped and the grease is cooled under conditions previously found most suitable, usually in pans or sometimes in the kettle itself. After cooling to room temperature, the grease is hard and perhaps a little brittle or crumbly, depending largely on the soap content. It is then put through a suitable agitator (milled). The hard gel is crushed and any lumps of gel are mashed homogeneously until the consistency reaches the softness desired. The grease is now of a smooth, buttery texture and has an attractive appearance, although the odor may at times be rather noticeable due to the high heat method of manufacture.

Obviously, the high temperatures required to make lithium stearate greases, as outlined above, offer definite hazards if it is desirable to use low viscosity oils having low flash points. Since it is necessary to use such oils in greases designed for use at 50° to 100° F below zero, a method has been developed whereby such greases can be made at comparatively low temperatures in steam-heated kettles and the resultant grease does not have to be milled after the grease is drawn.

Recently, lithium soap base greases have been developed which are resistant

to shear, i.e., they will not work down to a liquid in bearings. This has previously been one of the major drawbacks of this type of grease. Development work remains to be done before these greases become more widely available. At the present time the only greases of this type on the market today are considered "specialties," designed for a specific purpose.

Group No. 7, Mixed Base Greases: Grease chemists for years have combined two or more types of grease into one product for the purpose of incorporating the better qualities of each. They have been particularly successful in combining sodium and calcium soaps to produce a smooth grease having a relatively high melting point (two desirable characteristics in a ball and roller bearing grease). In some cases, very small amounts of sodium soaps are added to cup grease as stabilizers, but such products are not usually considered mixed base greases.

A second example of this type of product is calcium-lead soap base greases. These are used where extreme pressure characteristics are desired. Aluminum soap has been used in combination with other soaps to impart stringiness to the final product.

Method of manufacturing mixed base greases does not differ greatly from those shown for the types of soap involved. The two soaps are usually made simultaneously in the same kettle, and if, for example, the product desired is to be predominately soda base, it is manufactured along the lines of fibre grease or if the lime base is to predominate, it will be manufactured as a cup grease.

Controls exercised by grease manufacturers are under the supervision of a grease laboratory manned by technically trained men who insure that all raw materials used in manufacture meet rigid specifications; test each batch of grease and control uniformity of product from batch to batch. "Rule of thumb" methods, used until comparatively recently, have been superseded by scientific methods. Proof of the rigid quality control used is exemplified by the outstanding performance of greases in service.

During the war, demand of greases increased enormously in volume and at the same time the diversity of application of those products available increased. New products were required and supplied to meet the demand. However, diversity of application has not required a large number of new products. Knowledge of characteristics of greases in combination with scientific methods of manufacture and control are factors necessary to keep the number of products to a minimum and this is a desirable objective from the standpoint of the consumer.

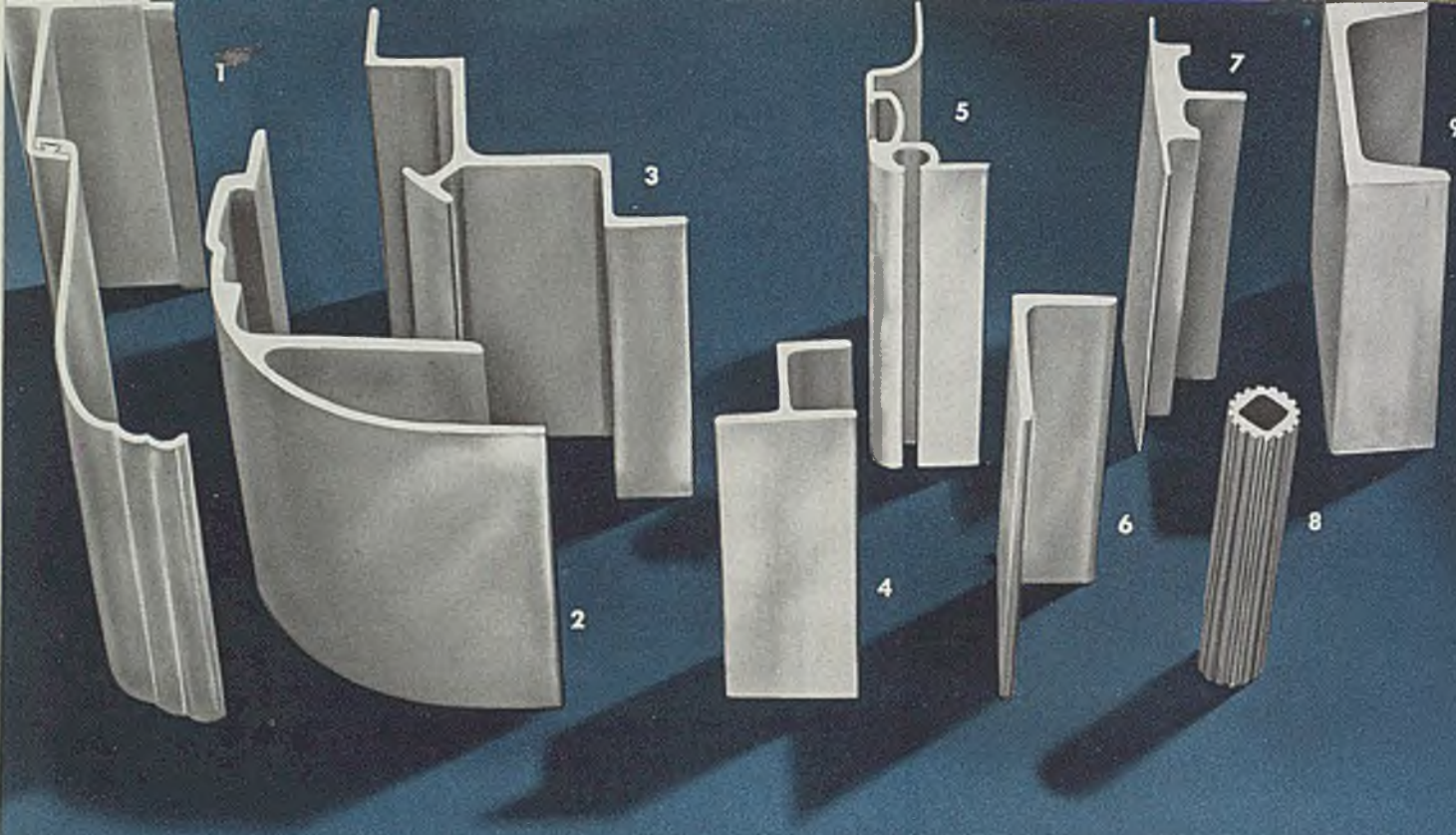
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Easy machining

Extrusion under great pressure produces metal that is dense and fine grained, free from blow holes. Speeds and feeds naturally vary with the alloy, but in general an extrusion is easily machined. By using special chucks, odd shapes can be fed in long lengths into automatic machines.

Dimensions

Maximum and minimum sizes and tolerances depend upon the alloy, cross section, and intricacy of design. The maximum size usually is 8" under favorable conditions. Large sizes often can be built up by dovetailing. (See No. 1, above.) Revere Extrusions are carefully straightened and inspected. Tolerances are .003" to .060", plus or minus. For closer tolerances or increased tempers in copper alloys, the shapes are given subsequent draws.

To help you economize

Revere offers the assistance of its salesmen and Technical Advisory Service in determining the applicability of special extruded shapes to your products. To take advantage of the cost-cutting and time-saving possibilities of extruded shapes, the first step is to write Revere. Just say: "We are interested in extrusions."



1. Store front section, aluminum
2. Truck body roof crown sill section, magnesium
3. Truck body corner post, magnesium
4. Truck body side post, magnesium
5. Aluminum rail car doorway section
6. Magnesium structural angle section for light plane
7. Light plane wingspar chord, aluminum
8. Magnesium rung for fireman's ladder
9. Channel section in magnesium

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INDUCTION HARDENING

Steam Hammer

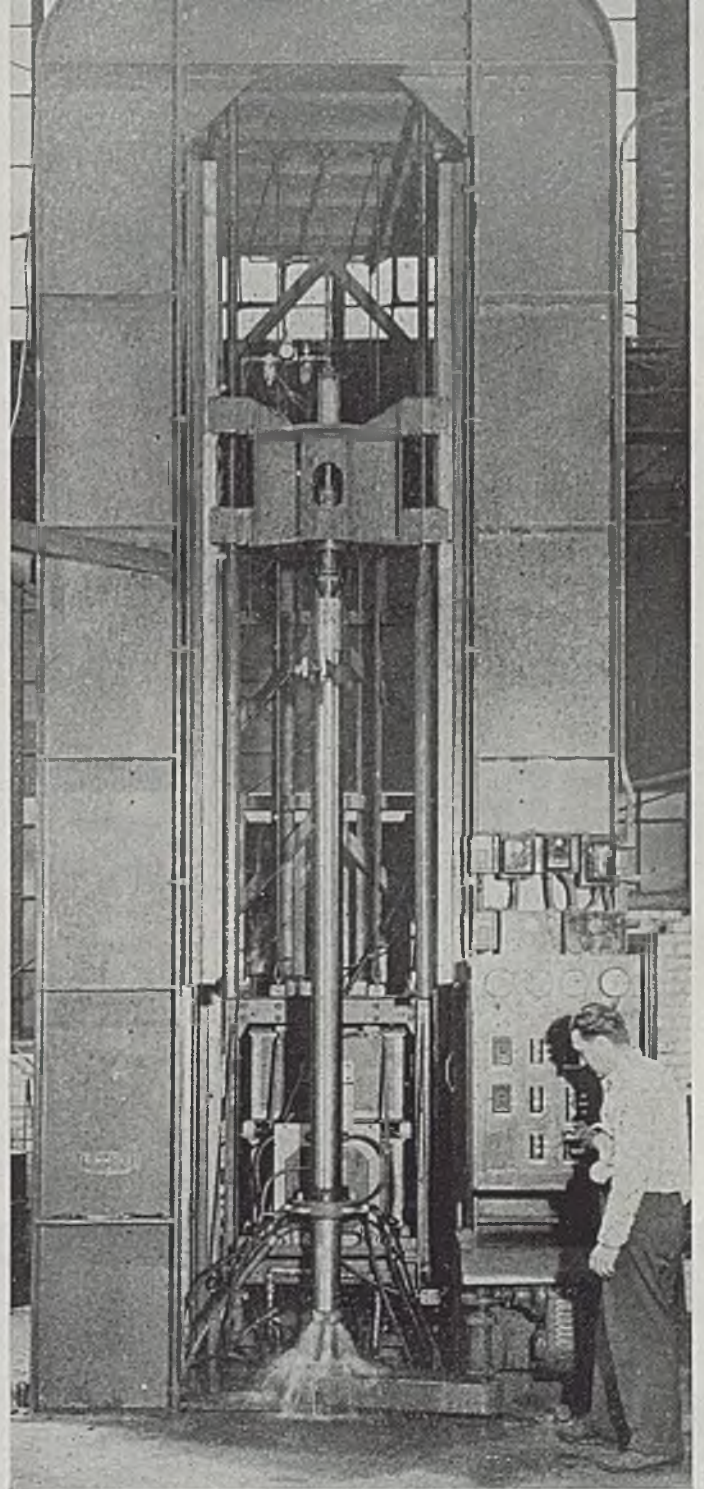
PISTON RODS

MORE than 2 years of field service testing has indicated that induction hardening of the ram taper area of steam hammer piston rods makes possible a substantial increase in service life, according to Heppenstall Co., Pittsburgh. Recognizing that a very large proportion of normal piston rod failure is the classic fatigue type generally conceded to be caused by repeated tension stress and starting at metal surface, the company has now completed a program of research and manufacturing development aimed at increasing service life of its piston rods.

Surface induction hardening of piston rod ram taper has for its principal object elimination of service failures caused by metal fatigue in the ram taper within the ram, at or near the top of taper. It is generally conceded that service failures of piston rods start on the surface of the rod, usually at some stress raising point such as a tool-mark, nick, groove, or a misfit between rod and ram. Failure progresses from the surface inwardly until section of rod is so decreased that it can no longer resist the direct stresses encountered in service.

This type of failure was recognized as being closely related to failures experienced with automobile crankshafts. It was known that a surface induction hardening of these crankshafts had greatly increased their service life. Induction hardening of the surface appeared desirable, in addition to conventional heat treating of piston rods.

With the co-operation of Ohio Crankshaft Co., Cleveland, a method was found whereby piston rods could be case hardened on the ram taper surface. Initial tests were conducted on experimental equipment, with piston rods



in a horizontal position. The vertical induction heat treating apparatus shown in accompanying illustration is used at present.

A heat treated, completely finished and ground piston rod is suitably preheated, and a water-cooled induction heating unit slipped around ram taper end. Rod is revolved at a speed commensurate with its size and desired heating rate. A pass then is made with induction heating ring and quench spray. Rod surface is raised to approximately 1600°F—a bright cherry red—and is progressively hardened on surface by immediate impingement of a traveling cold water spray attached directly beneath induction ring.

Surface hardening process produces a hardened case
(Please turn to Page 142)

Inspects Heavy Steel Sections with

1000-Kilovolt X-RAY UNIT

INSTALLATION of a 1000-kv x-ray unit in the steel foundry at the Bethlehem plant of Bethlehem Steel Co. adds another producer of quality castings to the select group employing million-volt equipment as an inspection and control tool in their foundry technique. Such equipment permits the rapid inspection of heavy sections with greatly reduced exposure time compared with the conventional radium-pellet (gamma ray) procedure. The Bethlehem unit is designed for the routine inspection of heavy sections of steel up to 8-in. thickness.

Detection of internal defects in castings, although the primary function of radiography, is by no means the sole advantage offered by this inspection method. Radiography affords a rapid

nondestructive check on the soundness of production castings and permits the inspection of a larger percentage of the product than would otherwise be possible. Such production control enables the foundryman to verify his molding technique on a day-by-day basis, and if changes are indicated they may be

made quickly without waiting for slower radiographic results or the costly sectioning of one casting. Routine radiographic inspection has a further application for intricate castings, with particular reference to areas which may be highly stressed in service. Castings so inspected may be used with complete confidence for service in fields where higher stresses are encountered.

In instances where repair welding may be necessary, a rapid radiographic survey of the area in question reassures both foundryman and customer that an adequate amount of metal has been re-

Equipment installed by Bethlehem affords rapid inspection of castings. Numerous exposures on a variety of products are possible with ease of manipulation and safety. Work handled on 40-ton powered transfer car and 8-ton crane

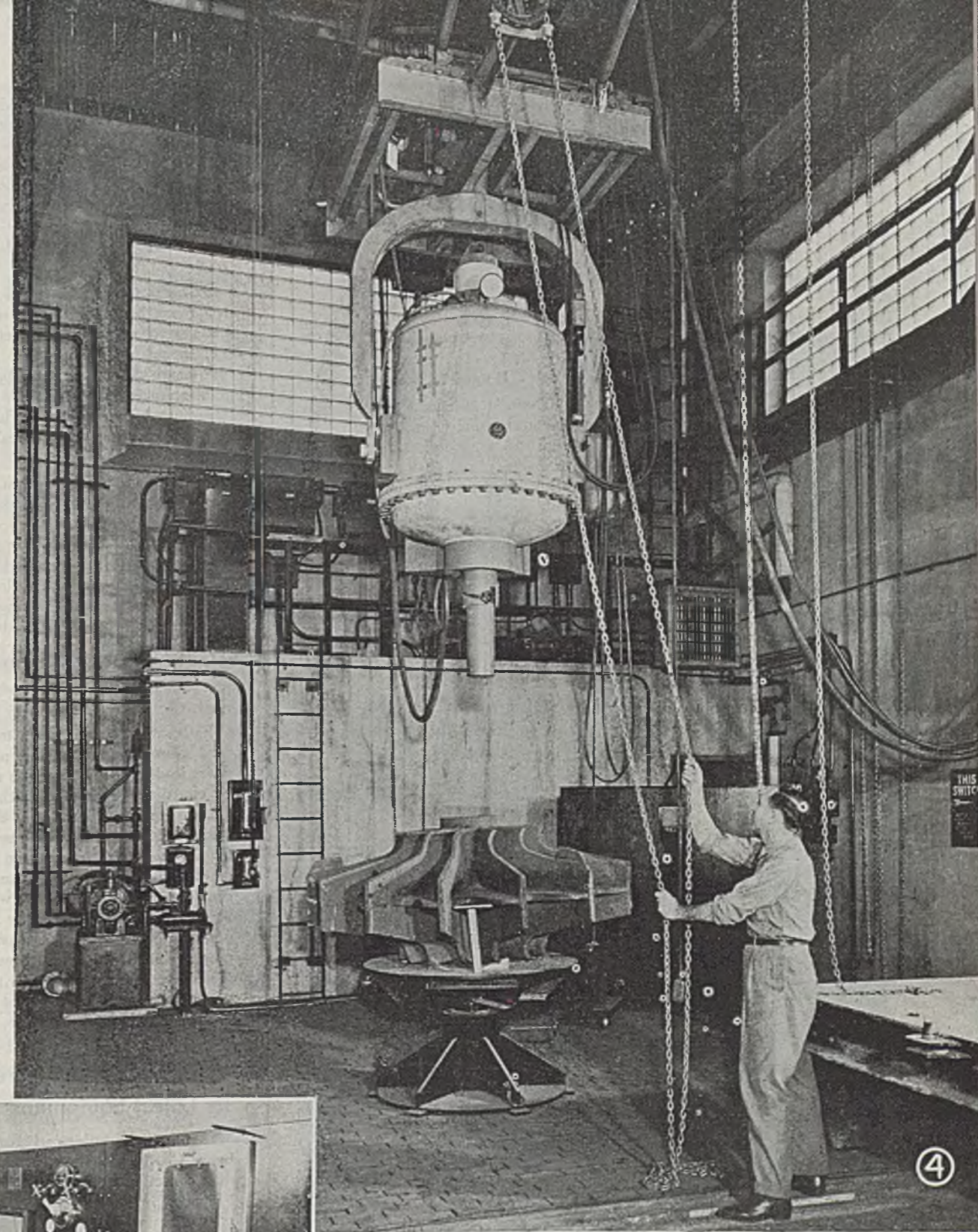
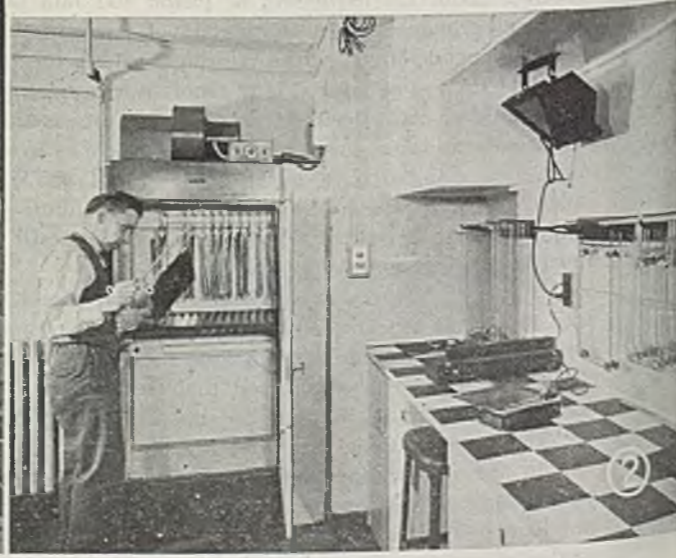
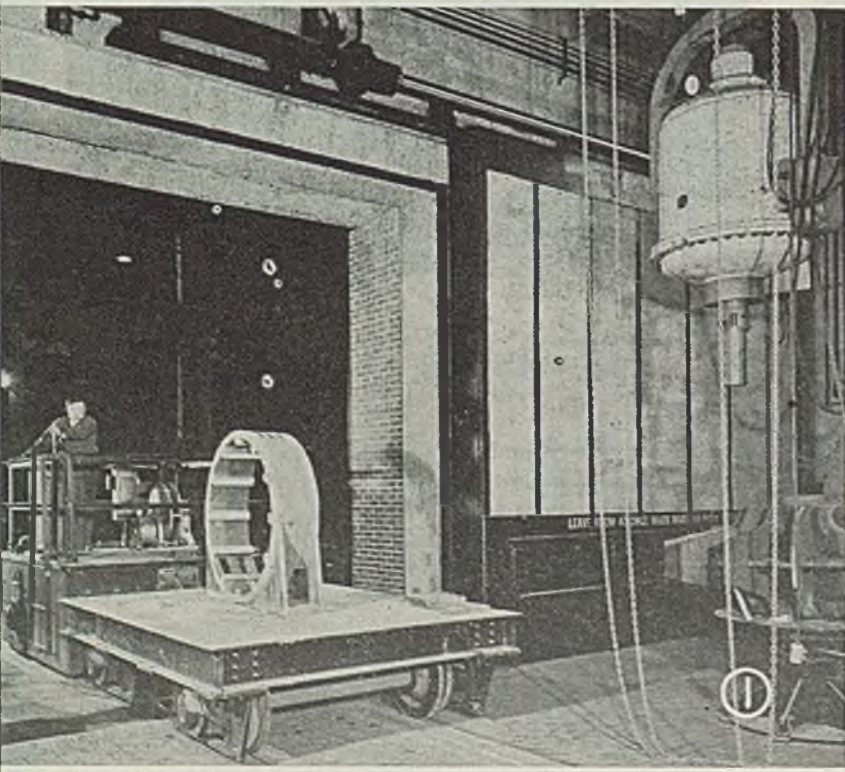


Fig. 1—Castings are moved from foundry to x-ray laboratory on transfer car. A 50-ton sliding steel and concrete door closes opening between foundry and laboratory

Fig. 2—Dark room of x-ray laboratory. Plates can be passed directly from film dryer at left into adjacent viewing room

Fig. 3—Dark room developer tanks and dryer frame

Fig. 4—Lowering x-ray tube into proper position prior to exposure



moved and the welding properly done.

In order to utilize high-speed radiographic equipment to the best advantage as a production control tool in the foundry, facilities must be provided for the rapid positioning of castings for x-ray exposure. Handling equipment must permit numerous exposures on a variety of casting sizes with emphasis on ease of manipulation and safety.

The generating unit of the new x-ray machine installed at the Bethlehem plant consists of a low-frequency resonance transformer with a multisection x-ray tube mounted at the center of the transformer. Both are housed in a tank of ¼-in. steel plate, 3 ft diameter and 4 ft high, weighing about 1500 lb. Both the transformer and the tube are insulated from the grounded steel tank by a special gas maintained at 60 psi pressure. The x-rays are generated from a target mounted on the end of an extension chamber which projects from

the lower end of the steel plate tank.

The tank is assembled in a cradle carried by overhead crane running on a track 28 ft above the floor, and is easily maneuvered into any position in the room. The cradle carrier can be rotated 360 degrees on the yoke of the crane, and it can also be turned on trunnions, from a vertical to a horizontal position. Besides being readily manipulated, the unit is of simple, but rugged design, reliable in performance and free from exposed high voltages.

Housed in Special Room

The unit is housed in an extension to the steel foundry, in a room 25 x 42 ft, with 24-in. monolithic concrete walls extending 7 ft below grade. Glass-block windows high on the walls furnish daylight in the room. A 24-in wide concrete maze, with ¼-in lead door, serves as entrance and exit. Leading out to the foundry is a 15 x 15 ft opening, closed by a hydraulically-

operated 50-ton concrete and steel door 18 in. thick. Work is brought in from the foundry on a 40-ton powered transfer car and handled inside with an 8-ton overhead crane. Castings too heavy for this crane are left on the cars during exposure, while the lighter pieces are placed on a revolving table near the track.

Adjacent to the x-ray room is the control room, 8 x 14 ft, which contains the main panel where the complete test control is set up. The timer controlling the length of exposure can be set for 1 min intervals, up to 55 min. When the preadjusted exposure time has elapsed the timer automatically breaks the interlock circuit.

An 11 x 18 ft dark room, equipped with sink, developing tanks, loading platform and film dryer is located next to the control room. Entrance and exit to the dark room are gained through a light-proof maze. The developed plates are passed into the adjacent viewing room direct from the film dryer. The remainder of the building is used as office space. On the second floor is a film storage with room for about 100,000 negatives.

Elaborate precautions are taken to insure safe operation of the unit. Both doors leading to the exposure room must be closed, otherwise the machine is unable to operate. Before an exposure is made, a horn, which can be set to sound for 30 sec, gives warning in all rooms of the building, as well as in the adjacent section of the foundry, while a red light on the doors serves the same purpose during exposure. A master switch, properly marked, has also been provided in the x-ray room, making it possible to turn the power off at that point in emergencies.

Worker Comfort Increased By Latest Equipment

In the Eight Mile road plant of Carbonyl Co. Inc., Detroit, a new type of dust collecting system has been installed. Furnaces, in which powdered metals are converted into hard cemented carbides, are equipped with suction hoods to lessen summer heat in surrounding areas. Unit heaters are located scientifically to insure even heating of the building, and fresh air taken in to compensate for suction losses is heated during the winter months. Drafts and cold blasts of air from open doors is eliminated by use of an "air locked" dock for trucks.

A high ceiling is incorporated in the plant design to aid in reducing noise. Conveyors facilitate the handling of heavy carbide metals and help to maintain a continuous mass-production flow.



CHECKING INDUSTRIAL VISION: Detection of visually unfit employees needing eye examination and correction is possible in three or four minutes through a newly developed, portable sight-screener instrument announced by the American Optical Co., Southbridge, Mass. Data on 14 different visual functions can be obtained through the instrument, facilitating promotion of industrial efficiency and safety

Unique Plate-Type HEAT EXCHANGER

FOR PICKLING, ETCHING, PLATING, CLEANING

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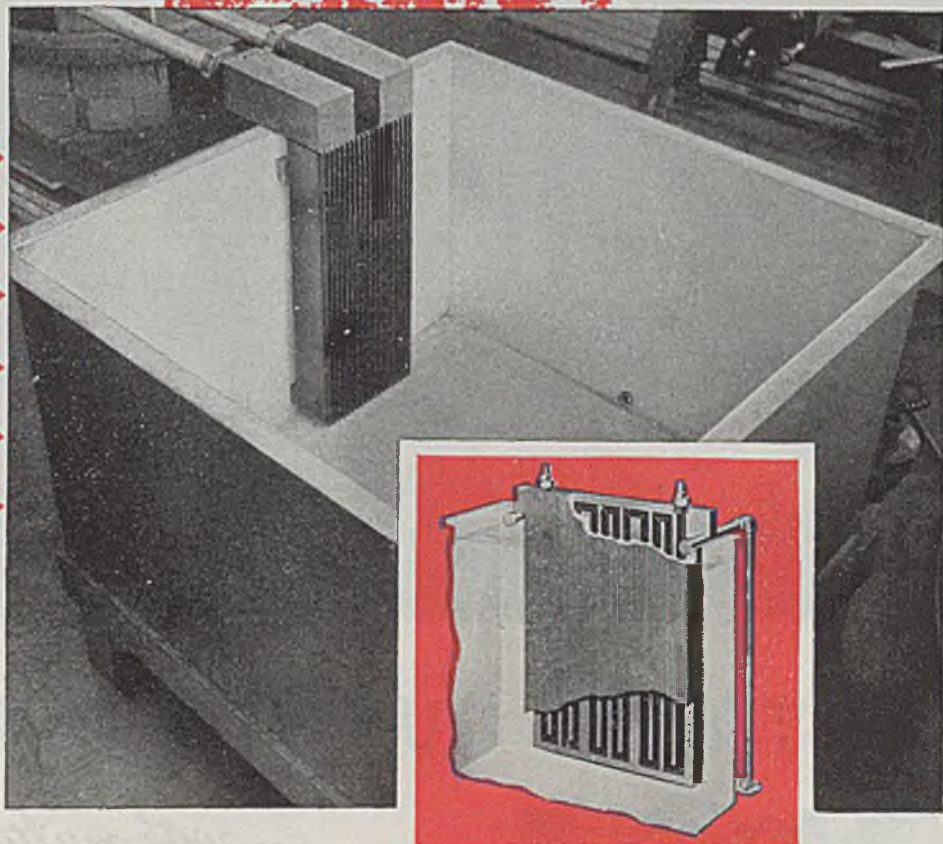
IT IS CORROSION-

RESISTANT AND

PROVIDES HIGH

HEAT TRANSFER

The "Karbate" Plate-Type Heater installed in a pickling tank, and a cut-away drawing of its construction.



DEVELOPED by National Carbon Company, Inc., and thoroughly proved in the field, the "Karbate" Plate-Type Heat Exchanger combines chemical inertness with high heat transfer and resistance to thermal and mechanical shock.

Thus, this unique heat exchanger is not affected by hydrochloric, dilute sulphuric, mixtures of nitric and hydrofluoric acids, or by chlorinated organic compounds. This... plus its unusual strength and sturdiness... makes the "Karbate" Heat Exchanger ideal for almost all heating and cooling operations.

This heater is especially valuable in pickling, etching, plating, or cleaning—where a heat ex-

changer must often take rough treatment. Still another advantage in plating and pickling is that it prevents dilution of the solution.

Simple in design and construction, the plates, or blocks, have tubular channels for flow of heating or cooling liquid. The outer surface is corrugated for utmost heat transfer. The units are light in weight, compact, easily installed, and available in various sizes. They may also be used in multiple, providing the desired capacity.

For more details, write for Catalog Section M-8804.

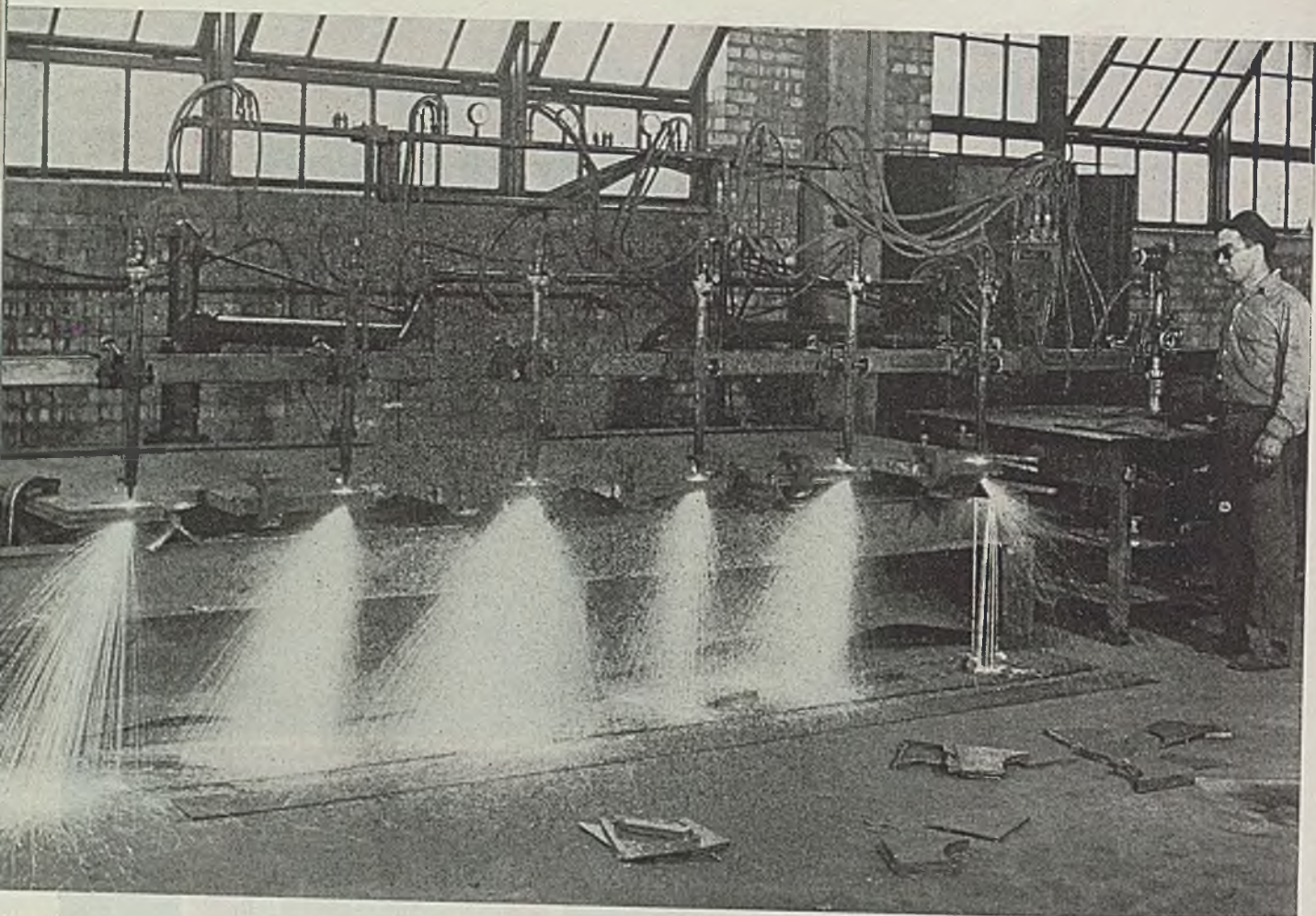


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STACK CUTTING PLATES

...with multiple torch setup

Chicago company uses wartime equipment in turning out steel parts to close tolerances at high rate of production

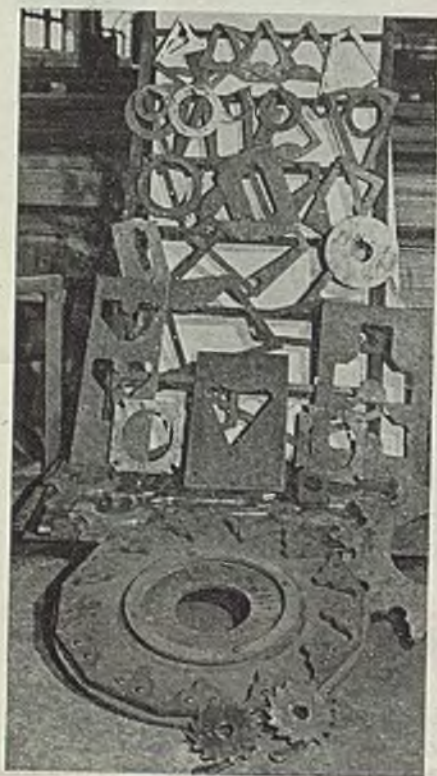
By MARK KEAVENY
 Superintendent
 Flame Cutting Department
 Burton Auto Spring Corp.
 Chicago

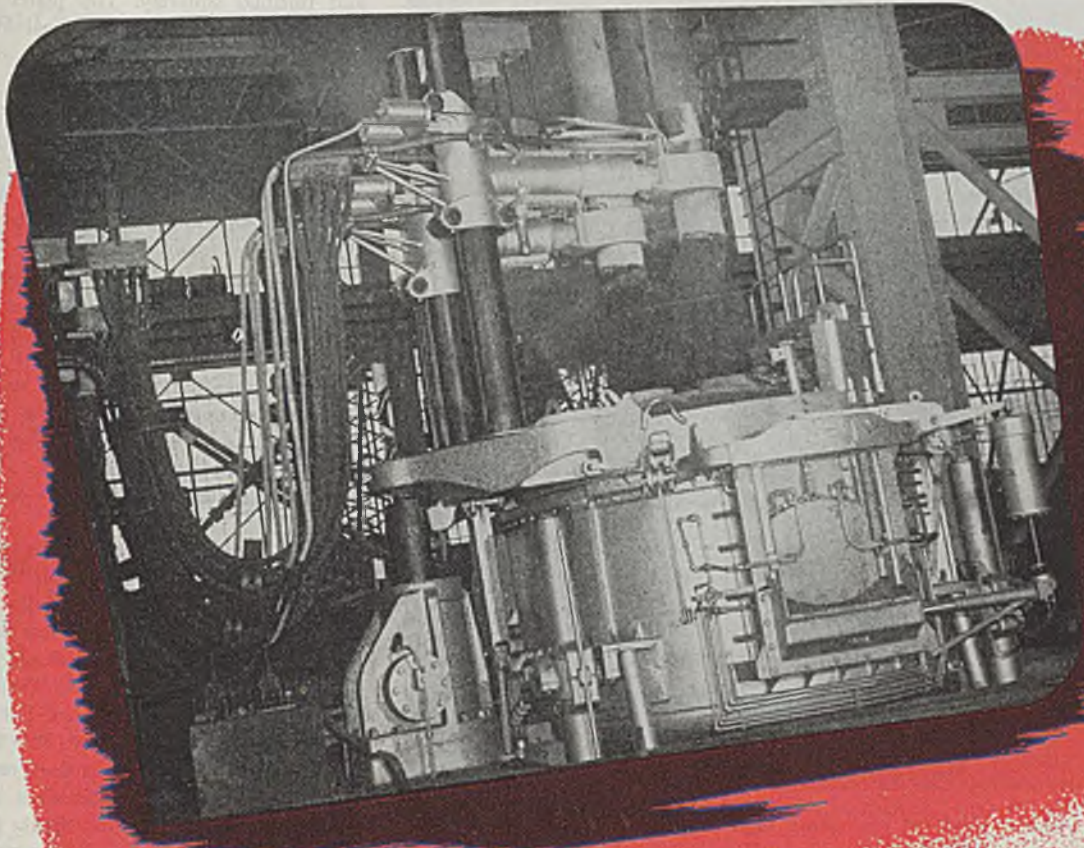
Fig. 1 (above)—Six torches are cutting stack of six ¼-in. plates. Over 73,000 gusset plates have been cut without rejects. Magnetic tracing device is shown at right

Fig. 2 (left)—Templates and typical flame cut parts produced by Burton. Note how templates are mounted on heavy base plates

THE process of transforming a peacetime manufacturer into a wartime contractor, as many discovered, is not easy. Entailing as it does a myriad of unusual problems and headaches, it is to the eternal credit of American industry that so many such transformations took place in time to win a war. It is now a matter of record that the great majority of personal interests in this country were subordinated to the demands of emergency, as plants of every description moved to abandon normal routines and acquired the necessary new methods, new techniques and new equipment with which to meet war requirements.

It is just as difficult to swing back into peacetime production. The "spectre of





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Lectromelt
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The Lectromelt Furnace is designed by skilled engineers and practical metallurgists on the basis of broad experience. Experience has taught that simplicity of design, operation, and maintenance are the fundamental qualities of a great electric furnace. In the Lectromelt design all complex operating mechanisms have been minimized. This means ease of operation and low maintenance costs. This attention to fundamentals has resulted in long efficient service with minimum maintenance which characterizes Lectromelt equipment.

You can also depend on Lectromelt not to overlook any opportunity for improvement that is . . . *Experience Proven.*

PITTSBURGH LECTROMELT FURNACE CORP.
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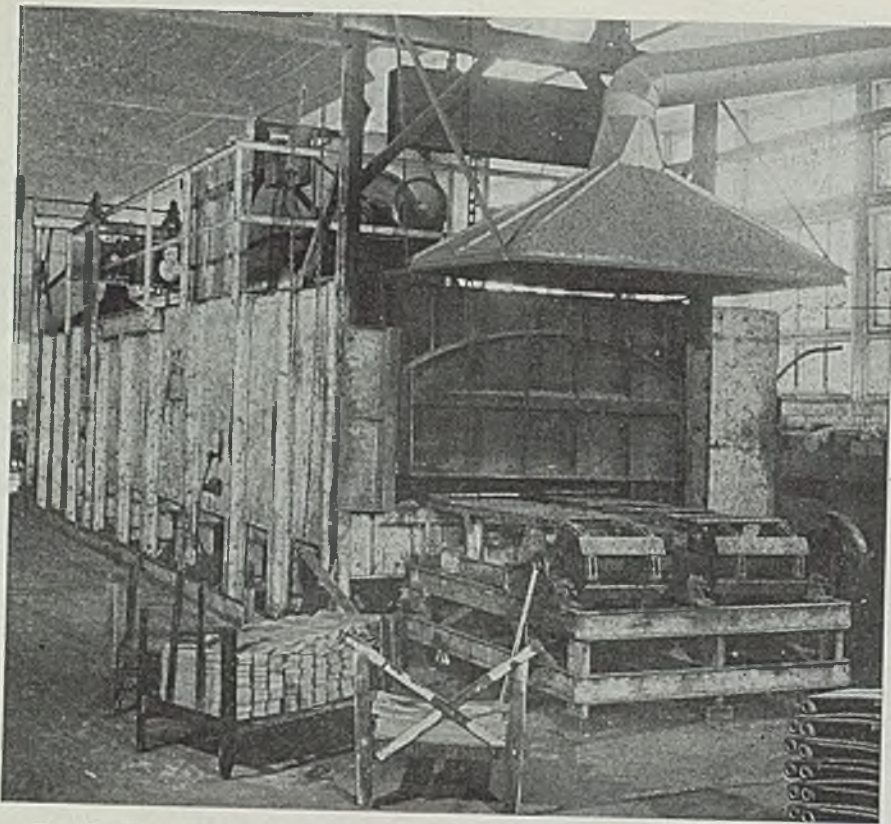


Fig. 3—This furnace is used for preheating high alloy steels prior to flame cutting and also for hardening, normalizing and tempering

reconversion" is in reality the natural problem of how and where to change war-tested facilities over into equally useful positions in peaceful channels. That this constitutes a problem nobody will deny.

But reconversion is well out of the way—the companies which were made into arsenals have largely returned to their previous pursuits, and some have even expanded their peacetime fields with the aid of wartime acquired knowledge and equipment.

This equipment won a place for itself by successfully meeting every test of the highly intensified period during which it was procured. It seems obvious that such equipment should not be discarded, since cancellation of war orders only means that the war plant facilities are free to perform other jobs.

Until the outbreak of World War II, Burton Auto Spring Corp. had been a designer and manufacturer of leaf springs for automobiles, trucks, trailers, semi-trailers, and buses. When the war came, the company converted to cutting tank armor plate. When the inevitable cut-backs arrived, the plant was still geared to mass production with, among other things, a number of gas cutting machines added to our facilities. Since we had fully tested these machines, it was never a question of doing away with our flame cutting processes, but of converting their capabilities to peacetime production.

Burton immediately started solicitation of flame cutting jobs, and a rather sizeable volume was built up. We have cut many odd designs, such as sprockets, ratchets, pawls, flanges, etc., on a mass production basis, and find that the flame cutting of these and similar pieces gives such quality and holds the parts to such tolerances that further machining is very rarely necessary.

One of the flame cutting department's most successful jobs is the stack cutting of gusset plates, using an Airco Oxygraph with a six torch setup. By this multiple torch stack cutting, (a combination of two processes not usually regarded as interchangeable) we cut from as many as seven thicknesses of $\frac{1}{4}$ -in. steel plate at once, and find this process to be faster and less expensive than other methods of fabrication, since the machine is turning out six times as many pieces from a stack of plates as one torch could cut, and with little variation in costs.

Fig. 1 shows the Oxygraph in operation, with six torches at work on a stack of six $\frac{1}{4}$ -in. plates. The magnetic tracing device may be seen at the right. On this job we cut a total of 2724 pieces in 15 hr 50 min. The time consumed in setting up the machine and the work, and in the removal of scrap, was 1 hr 45 min so that the actual cutting time was 14 hr 5 min. Thus, we actually cut about 194 pieces per hour, with each piece held to tolerance

and finished squarely. The plates consisted of a total of 46,632 lineal inches to be cut, or about 3330 lineal inches per hour.

The total oxygen consumption for this period, including the setup and scrap removal time, was about 2050 cu ft; the acetylene consumed amounted to about 255 cu ft. Operating pressures were, for oxygen, 70 lb manifold pressure, 58 lb line pressure and 45 lb at the header; for acetylene, 5 lb tank pressure.

An interesting feature to many will be the sparse use of clamps on the stack of plates, since the first rule for successful stack cutting is to hold the plates in intimate contact with each other with their edges in good alignment, a rule that necessitates using quite a few clamps.

Many clamps, of various styles, might well be used on such a job, but the operation has been done successfully here, after some experimenting, with less clamps by observing one or two simple precautions. We first ascertain that the plates to be cut are clean and flat. We place them on a perfectly flat table, making sure that the cross bars on the table are not warped, and then space our torches about 24 in. apart. After the cutting begins we find it necessary to shift the three or four clamps in front only once. Despite this system of using fewer clamps we do not find it difficult to hold the stack tightly and in perfect alignment.

On a similar job, in which we stack cut $\frac{3}{16}$ -in. plates, eight high, our operators secured excellent results with an oxygen manifold pressure of 80 lb, and an acetylene tank pressure of $7\frac{1}{2}$ lb, employing Airco Style 144 No. 3 tips. Again, the stack was held securely with a minimum of clamps.

Templates, with some finished flame cut pieces, may be seen in Fig. 2. The items shown that are of $\frac{3}{16}$ or $\frac{1}{4}$ -in. plate were stack cut, as described. In making templates we find it an easy matter to lay the design out on paper, transfer it to $\frac{1}{4}$ -in. plate by center punching through the paper, and then cutting the plate with a saw, filing it if necessary. The templates are mounted on one base plate, which is usually of material heavy enough to eliminate clamping to the tracing table. Several holes are drilled and tapped in the plate to match holes in the template being used. The number of pieces produced by multiple torch stack cutting, following the dimensions of such templates, has run into the very high thousands without rejections.

The heat treating furnace shown in Fig. 3 is used to preheat high alloy steels when necessary before entering the flame cutting department, and also to harden, temper and normalize finished parts as may be requested by the customer.

Coal Chemical Research

(Concluded from Page 104)

ties of hydrogen. In Europe prior to World War II, hydrogen from coke competed successfully with water gas hydrogen, and its production was reported to have increased progressively at the expense of the latter. The ethylene in coke oven gas, on the basis of 2.5 per cent by volume of the gas assuming a value of 1.5 cents per pound, is worth about 30 cents per ton of coal, if completely recovered.

Another item of research is waste disposal. The principal wastes from the by-product plants are ammonia still waste,

acid sludge, and in some plants the wash oil muck. Compounds present are principally calcium chloride, smaller amounts of other calcium salts, and a multitude of tarry compounds, all present in extremely low concentration. The best method to dispose of the organic matter is to destroy it. So far the most generally useful method appears to be by bacterial action in sewage plants or by bacterial filters.

It is conceivable that fundamental information on the nature of coals would eventually permit modifications in processes of coal carbonization or coal treatment which would affect the whole coal chemical picture profoundly. It is

impossible to foresee the effects of such knowledge, but it is essential that we have it, although the problem is very difficult and progress is very slow. In the long run fundamental research has proved to be extremely valuable and good insurance for the future. The problems in the coal chemical fields are particularly tough, and solutions will not be achieved quickly or easily, but there is every reason to expect that earnest work on them will prove as beneficial in the future as it has in the past.

Condensation of a paper to be presented before the Blast Furnace and Coke Association of the Chicago District, Del Prado Hotel Chicago, March 26.

New Literature

"FELT FACTS"

By Felt Association Inc., Committee on Information, 480 Lexington avenue, New York 17.

(Illustrated leaflet)

Published frequently, leaflet discusses uses of wool felt in many manufacturing processes. Association would like to obtain photographs and data. New photographs will be purchased for use in *Felt Facts* and for publicity in other media.

MILLING MACHINE

By Kearney & Trecker Corp., Milwaukee (An 83-page booklet, illustrated.)

Book II in milling practice series, it is divided into nine chapters, covering knee and bed types of milling machines, attachments, and operation.

X-RAY SPECTROMETER

By North American Philips Co. Inc., 100 East 42nd street, New York.

(A 12-page booklet with photographs and drawings.)

Entitled "Engineering-Design Development of X-Ray Spectrometer," booklet covers: X-ray diffraction principles, new instrument requirements, x-ray source, pulse conditioning, frequency meter circuit, counting meter circuit, meters and controls, and applications.

BLOW, SPRAY GUNS

By B. F. Goodrich Co., Akron, O.

(A 22-page booklet, with illustrations and charts.)

Explains the principle of Lonn valves which have only three working parts and give constant fingertip control of air or water under pressure without use of levers, springs, pushbuttons, packings or screws. Elimination of small parts re-

duces repair and replacement problems and results in low maintenance cost. Charts showing cost of air or water delivered through various sized orifices when uncontrolled are included. Each Lonn gun is shown, its applications outlined, and other pertinent details given.

MAGNETIC EQUIPMENT

By Stearns Magnetic Mfg. Co., Milwaukee 4.

(A 4-page, 2-color folder, illustrated)

Entitled "Magnetic Equipment for The Coal Industry," folder describes application of magnetic pulleys, suspended magnets and spout magnets for removing tramp iron and metallic junk automatically and economically from the flow.

SUPERVISOR AIDS

By Elliott Service Co., Department M-129, 219 East 44th street, New York 17. (Seven illustrated catalogs.)

Contain information to help meet current and future employee relations problems. Titles are: How to Handle Grievances, Qualities of a Good Boss, How to Correct Workers, How to Train Workers Quickly, How to Cut Wastes, How to Create Job Satisfaction, and How to Get Out More Work.

USES OF OXYGEN

By Air Reduction Sales Co., 60 East 42nd, New York 17.

(A 24-page, 2-color booklet, No. ADG-2014, illustrated.)

Entitled "Oxygen—Indispensable Servant of Industry," booklet describes how 99.5 per cent pure oxygen is made and how it is used in industry. It also discusses different types of packages for varying oxygen volume requirements, operating conditions, and internal plant gas distribution methods, as well as the company's engineering service for technical assistance. Includes descriptions of hand and mechanical welding, flame

hardening, flame cleaning, underwater cutting, hand and machine gas cutting, and other flame processes, with photographs of apparatus, accessories and supplies and other technical literature.

VACUUM PUMPS

By F. J. Stokes Machine Co., Tabor road, Philadelphia 20.

(2-color, 4-page bulletin, illustrated.)

Lists applications, dimensions, and specifications. Pump features high volumetric efficiency, low power requirement, simple design, standardized, precision finished parts, easy installation, etc.

FIRE EXTINGUISHERS

By General Detroit Corp., 2270 East Jefferson avenue, Detroit 7, (An illustrated file folder.)

Include sketches of five principal types of fire extinguishers, classes of fire for which each is recommended, Underwriters' Laboratories rating for each, and other data on operation, recharging, and effectiveness of extinguishers. There also are excerpts from Underwriters' definitions of classes of fire and units of protection as applied to extinguishers.

BROACHING

By LaPointe Machine Tool Co., Hudson, Mass.

(A 108-page book, illustrated.)

Additional copies of book answering many questions on broaching are available. Describes postwar applications for broaching.

STOP WATCHES

By Herman H. Sticht Co. Inc., 27 Park place, New York 7.

(Bulletin No. 575, illustrated.)

Describes and illustrates imported stop watches of 1/5-sec as well as decimal timers which divide a minute into 100 parts, and also lists prices.

INDUSTRIAL EQUIPMENT

Mobile Crane

A new rubber-mounted, mobile crane unit, embodying power shovel, trench-hoe, dragline and clamshell, is announced by American Steel Dredge Co. Inc., Fort Wayne, Ind. It has inde-



pendent or simultaneous operation of boom, shovel, or trench hoe, or propulsion mechanism.

The unit can travel, boom, swing and hoist at the same time. It has self-leveling chassis which permits operation on uneven ground; full-vision cab and all machinery gears enclosed and oil-immersed. There is no center-pin as cab revolves on a 48-in. ball-race outside the swing-gear.

Power plant is a 62 hp gasoline engine which drives all four wheels and hoisting

mechanism. Hoist drums are oversize, reducing cable wear. The unit complies with all highway regulations — no permit needed to travel on public roads. Short wheel base, 7 ft 8 in., gives greater maneuverability. It has four travel speeds up to 15 mph.

Steel 3/25/46; Item No. 9100

Boring, Facing Unit

A two-way special purpose machine designed for boring, facing and tapping valve bodies of iron, bronze or aluminum in a wide variety of shapes and sizes is announced by Snyder Tool & Engineering Co., Detroit.

The part is held in a fixture on a four-station trunnion. Work-holding device locates and clamps through a two-jaw chuck actuated by two hydraulic cylinders for clamping and unclamping. Side housings each contain two individually-driven and hydraulically fed tool spindles with brackets sliding on hardened and ground ways. Each spindle has a variable speed direct current motor to obtain maximum efficiency in the tool diameters used. Spindles are adjustable for speed independently through electric rheostats. Hydraulic feed rates are adjustable for each individual slide.

Tapping units are equipped with individual lead screw and quick-change pick-off gears for tool speed change. Lead screws for various pitch threads are easily exchanged. Left-hand housing carries indexing trunnion positioning mechanism which is motor driven over a Ge-

neva index wheel. Coolant tank and hydraulic unit and motor generator set for variable speed spindle motors are in the rear.

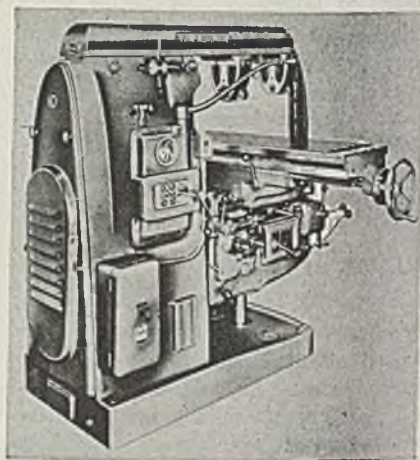
Control equipment is set up for manual or automatic operation, control buttons being provided for setting up each individual tool spindle independently. Work cycle is loading and clamping, indexing to the next station where all work spindles come in automatically performing various operations from both sides.

Steel 3/25/46; Item No. 9034

Horizontal Milling Machine

Van Norman Co., Springfield, Mass., announces a new No. 3 horizontal milling machine specially designed for a wide range of general purpose and production milling. A large heavy duty miller, it has a 64 x 14 in. table permitting the user to handle heavy work.

An important feature of the new transmission includes a heavy large diameter fly-wheel mounted on the spindle inside

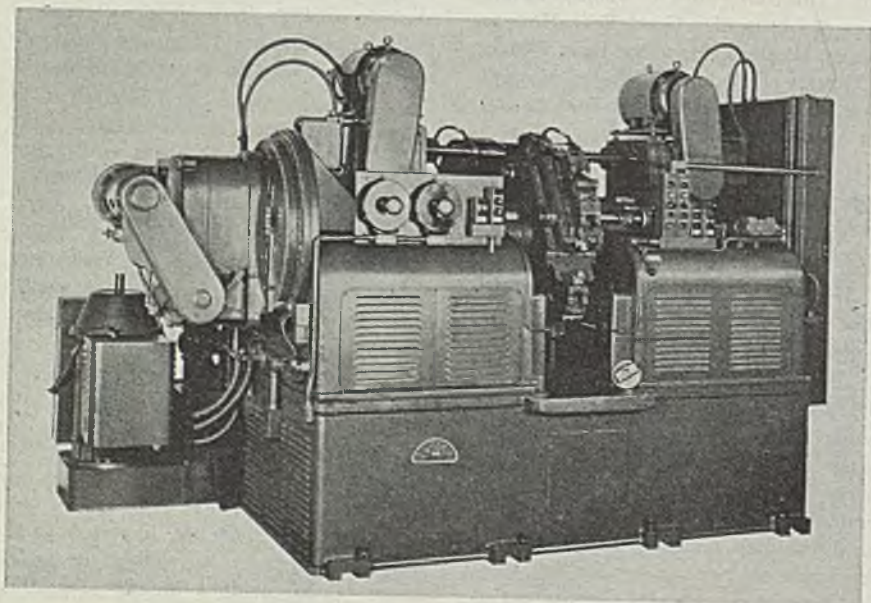


of the column assuring smooth, uniform application of power to the cutter.

Among other features incorporated in this unit are a new column and base which is broader and heavier with generous internal ribbing to assure rigid support for the heavy duty spindle transmission as well as the generously proportioned knee.

Rigid ram-type overarm has dove-tail ways bearing on the column. Improved cam-type gibbing solidly locks ram to column front and rear. An overarm pilot wheel provides exceptional ease for positioning the overarm. Sturdy arbor supports for B style arbors, are clamped to the underside of the overarm by cam-type locks. These supports are equipped with oil reservoirs which simplify arbor lubrication.

Ease of control is obtained by front and rear directional control of all power feeds. Actuated in the direction of desired movement, they provide maximum

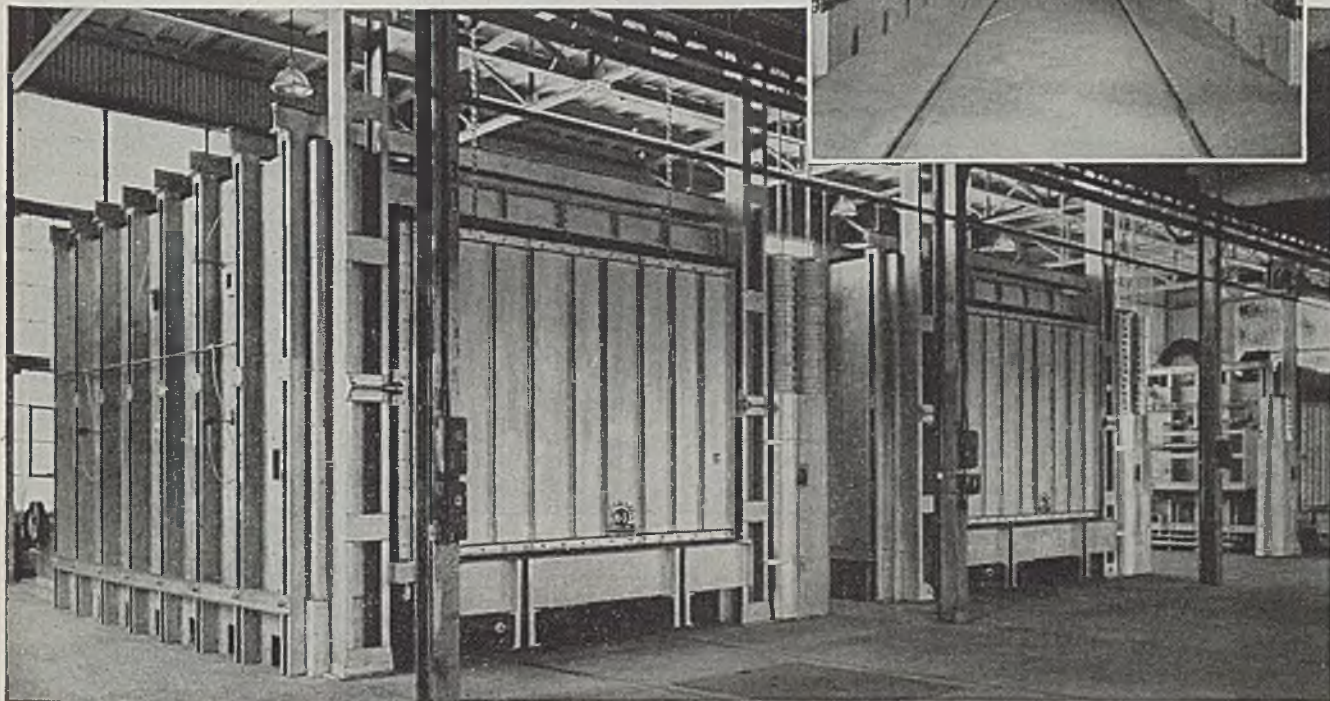
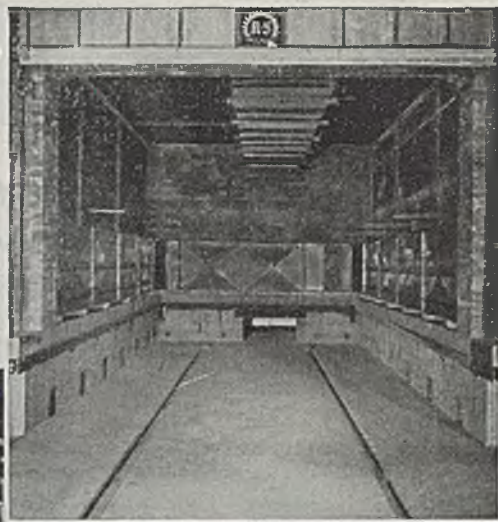


(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 138.)

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NAVAL ORDNANCE PLANT, YORK, PENNA.



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Rio de Janeiro • Sao Paulo • Mexico City

Two convection type furnaces (one a duplicate of one erected in 1941) and a direct fired furnace comprise this battery of R-S Car Hearth Furnaces.

Rugged construction throughout and motorized doors and cars operating from central control stations are outstanding features. The entire equipment is geared to individual plant conditions. Economy of operation, low maintenance cost and a minimum of manual effort are assured.

For heat-treating economy, efficiency and long life, specify R-S Industrial Furnaces.

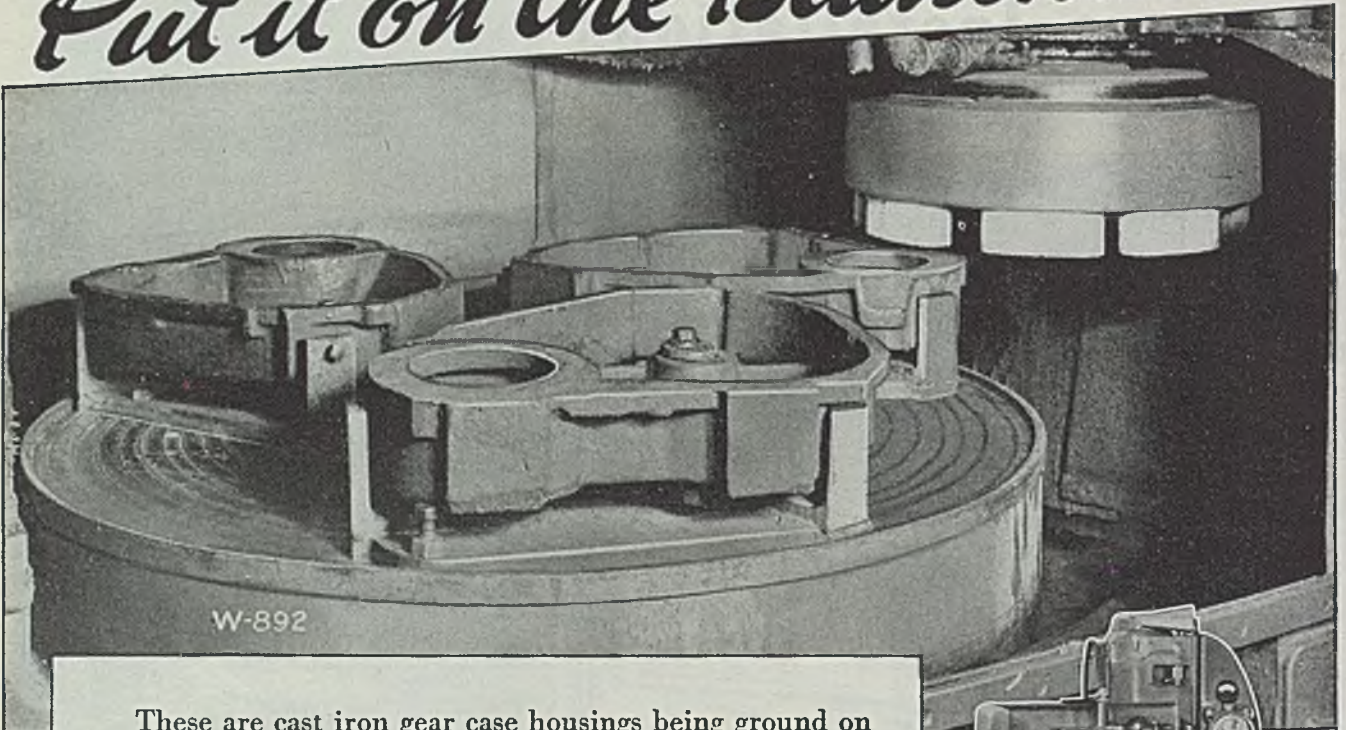
FURNACE DIVISION

R-S PRODUCTS CORPORATION

Manufacturing Engineers

"Furnaces of Distinction"

"Put it on the Blanchard"

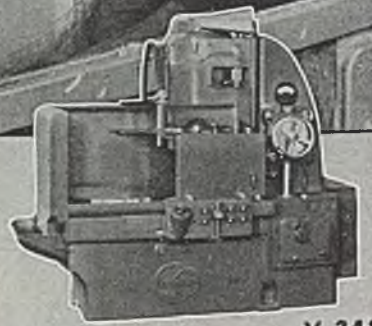


These are cast iron gear case housings being ground on a No. 18 Blanchard Surface Grinder—another demonstration of increased production of large work over former method.

They are held on a 42" magnetic chuck, three pieces per load, and $\frac{1}{8}$ " to $\frac{3}{16}$ " of stock is removed from the surface.

Production is at the rate of 8 to 9 per hour, a substantial increase over the former method of machining when only 2 were produced per hour.

When flat surfaces are required to provide oil-tight joints, "put it on the Blanchard" and also get increased production.



V-348

Get These Advantages...

- PRODUCTION** ✓
- ADAPTABILITY** ✓
- FIXTURE SAVING**
- OPERATION SAVING**
- MATERIAL SAVING**
- CLOSE LIMITS**
- FINE FINISH**
- FLATNESS** ✓



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.

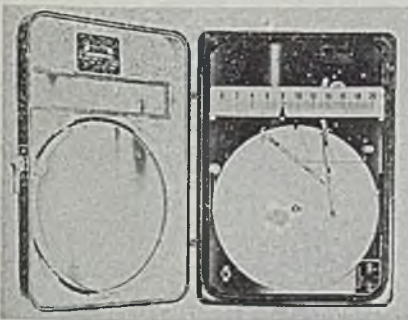
operator safety. In addition, hand feeds are provided in both front and rear of the miller enabling the operator to line up the work from either position. Single lever speed and feed selectors conveniently located on the machine provide quick easy selection of 18 speeds or 18 feeds.

Operating specifications of the unit include: Table 64 x 14 in.; drive motor 7½ hp; table travel longitudinal 34 in., saddle cross feed 12 in., knee vertical feed 17 in. Eighteen speeds are available from 25 to 1250 rpm; 18 feeds from ⅜ to 32 in. The miller is available with plain or universal saddle which permits table to be swiveled 45° to the right and 45° to the left.

Steel 3/25/46; Item No. 9042

Input Controller

Bristol Co., Waterbury 91, Conn., has developed a new electric type controller which combines a proportional current input controller and a recorder in one case. Designed to provide extremely accurate control of electrically heated furnaces and ovens, this instrument provides on-and-off type control with the advantages of proportioning control.



A rotating cam interrupts the flow of current to the heating coil or coils the duration of which is determined by the departure of the controlled temperature from the control point.

Steel 3/25/46; Item No. 9116

Humidity Chamber

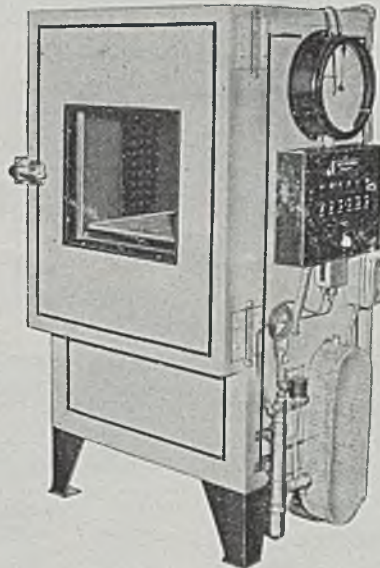
A new insulated variable temperature and humidity chamber for the simulation and control of atmospheric conditions is announced by Tenney Engineering Inc., 26 Avenue B, Newark 5, N. J.

Cabinets are scientifically designed to provide accurate simulation and control of any desired temperature, humidity and air circulation condition in laboratory or production testing operations. Batches or parts can be tested under standard or variable conditions. Temperature, humidity and air circulation can

be controlled to close preselected limits.

Conditioned air is kept in continuous forced circulation without undesirable draft. Uniform wet and dry bulb temperatures throughout the cabinet are thus provided.

Dry bulb temperature of the air can be set from temperature to any desired



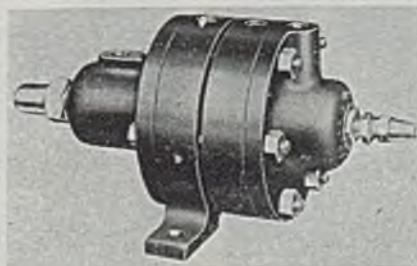
point. When unit is operating, this temperature does not vary in any part of cabinet by over 1° C plus or minus. Glass doors permit inspection of contents without exposure of same to outside air. Under any set conditions, temperature and humidity will remain constant during operation. A simple resetting of controls brings cabinet to a new equilibrium within ten to fifteen minutes. Available in laboratory and production sizes.

Steel 3/25/46; Item No. 9021

Pneumatic Relay

Hagan Corp., Pittsburgh, announces Type E totalizer, a pilot-operated, pneumatic relay, used to add or subtract loading pressures received from external sources.

Device is also used as a regulator. In a control system, the function it performs



depends upon the manner in which the loading pressures are applied to the several diaphragms of the totalizer. It requires a source of compressed air at sub-

stantially constant pressure for its operation. The totalizer may be used in connection with a measuring flow element and a power unit to regulate fluid flow, temperature, pressure, level, speed, or any other physical condition that can be transformed into a loading pressure as an indication of magnitude. When used as an element in a control system, the totalizer may perform any of the following functions:

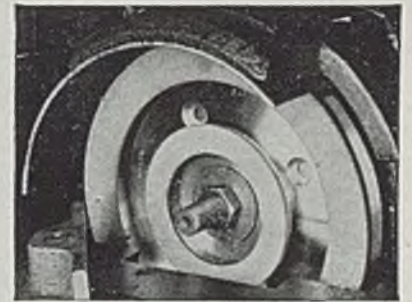
Add or subtract loading pressures; average two or more loading pressures; act as a selector of loading; respond to loading pressures sequentially; produce anticipating or derivative action; operate as a safety relay; act as a pneumatic stop for diaphragm-operated valves, receiving regulators, etc.; and invert loading pressures.

Steel 3/25/46; Item No. 9070

Diamond Cup Wheel

Precision Diamond Tool Co., 102 South Grove avenue, Elgin, Ill., introduces a new metal bonded diamond cup wheel to be used as a diamond honing wheel.

The cup wheel is made in 3 and 4 in. diameters and 500 mesh. It mounts on



the inside of the 6 or 7 in. diamond cup wheels used on standard carbide tool grinders.

After grinding on the large wheel, the operator can produce a fine cutting edge in a few seconds with one stroke across the honing wheel using the same tractor set-up. This eliminates hand honing and regrinding on specially provided carbide tool grinders.

Steel 3/25/46; Item No. 9092

Amplifier

A new Video amplifier designed primarily for use in amplifying complex waves to be viewed on an oscilloscope is announced by United Cinephone Corp., Torrington, Conn. It is also useful in laboratory work as an audio amplifier, for tracing and measuring small R. F. voltages (as in the early stages of radio receivers), and similar applications.

Frequency response is flat within 1.5 DB of the 10 KC response from 15 cycles

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 138.)

RB&W CAP SCREWS

**FIT FOR
REFINED
COMPANY**

Furnished Bright or Hi-Carb Heat Treated, RB&W Cap Screws give your product maximum fastener strength and finest appearance... and they are held to close tolerances that just a few short years ago were considered impossible for a commercial product.

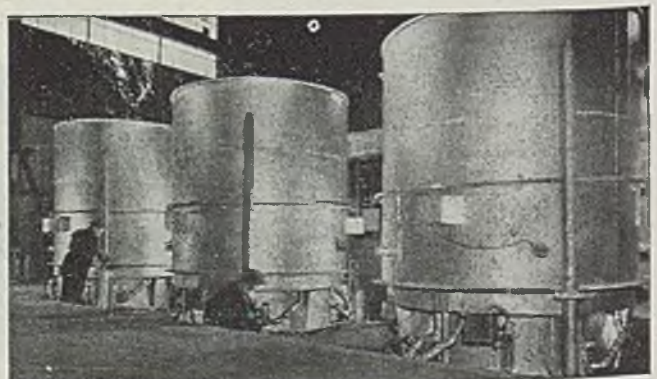
Uniform physical properties are assured by scientific selection and preparation of raw material, use of the latest type of modern equipment and a system of quality control followed throughout production.



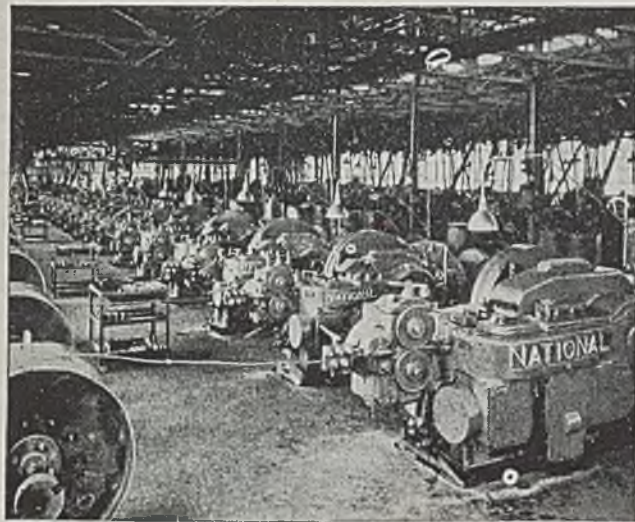
COMPLETE RANGE RB&W Cap Screws are produced in a size range up to 1" x 8" and are stocked through 1" x 6" in Bright and 3/4" in Hi-Carb Heat Treated. The Heat Treated screws have a black, satin-lustre finish obtained by a special RB&W process.



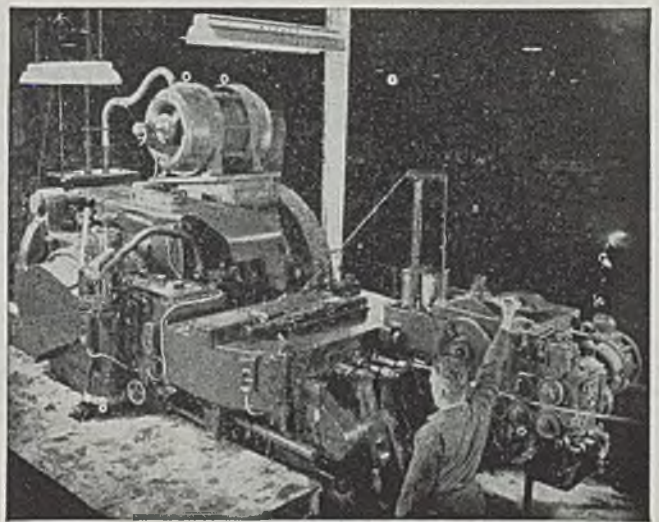
QUALITY CONTROL — Mechanical and physical examination of raw material plus continuous inspection at every stage of manufacture provide assurance of uniformity and top quality.



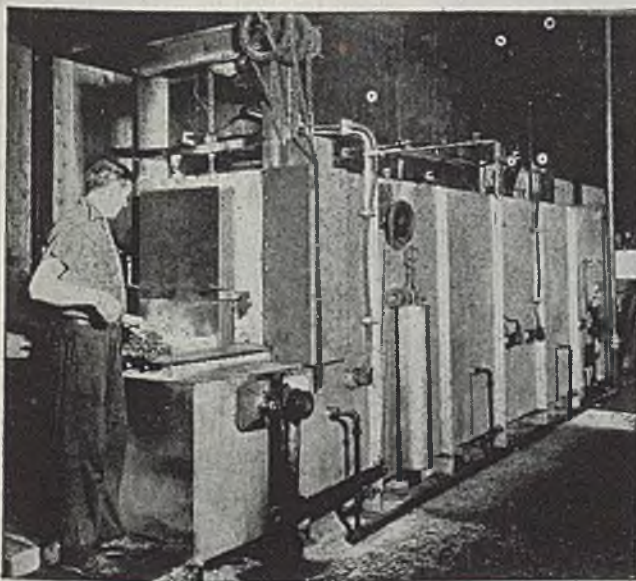
PREPARATION — Hi-carbon and alloy steels are prepared for cold-forming in these spheroidizing furnaces, which improve the micro-structure of the material.



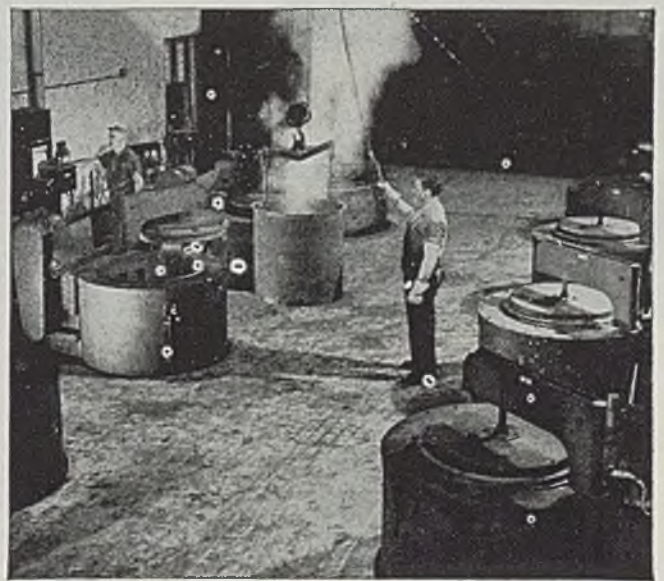
PRODUCTION — Impressive tonnage output daily comes from this battery of machines, representing only a fraction of RB&W Cap Screw manufacturing capacity.



LARGEST MACHINES — These machines have capacity for producing Cap Screws cold up to 1" diameter and offer maximum attainment in close tolerance work.



UNIFORM TREATMENT — All RB&W Hi-Carb Cap Screws are hardened in atmospheric-controlled furnaces. A very close automatic temperature control and other features provide uniform and thorough heating, with complete freedom from scale.



TEMPERING — After oil quenching, RB&W Hi-Carb screws are tempered in batch type draw furnaces. The final step is the application of the special satin finish which distinguishes this high strength product.

RB&W The complete quality line

101 YEARS *Making strong the things that make America strong*

Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill. Sales Offices at: Philadelphia, Chicago, Chattanooga, Los Angeles, Portland, Seattle. Distributors from coast to coast. By ordering through your distributor, you can get prompt service for your normal needs from his stocks. Also, the industry's most complete, easiest-to-use catalog.



RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

to 4 megacycles, and 3 DB from 10 cycles to 4.5 megacycles. Phase shift is reduced to a minimum to provide satisfactory reproduction of pulses on the order of one microsecond, and square waves at repetition rates as low as 100 a second.

Gain is approximately 1000 when direct input is used. Input is normally



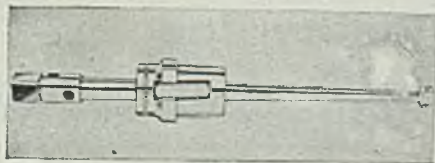
through a probe, furnished with the equipment, having an attenuation of 10 times. Amplifier direct input (without probe) is approximately 2.2 megohms of resistance in parallel with 40 mmfd. This compares with 1.1 megohm resistance in parallel with approximately 18 mmfd. when the probe is used. Output voltage can be adjusted from 0 to 50 v R. M. S. with sine wave signals. Ripple output is less than 0.5 v for all operating conditions and all positions of gain control.

Unit operates on a voltage of 110 to 120 v, 60 cycles with a power consumption of 100 w. A compact unit, it weighs 35 lb, complete with tubes and probe, and occupies a space of 7 $\frac{1}{4}$ x 9 x 20 $\frac{3}{4}$ in.

Steel 3/25/46; Item No. 9016

Tube Expanders

Model 16 tube expander serves for all general boiler work, railroad maintenance, boiler making and boiler repair. It may be readily dismantled and new



rolls quickly inserted. Frame holding the rolls is one piece heat treated steel, hardened and tempered for toughness and durability. Rolls are extra long and reversible for double length of service. They are set at an angle with the mandrel for self-feed. Reversing the mandrel releases the expander from the tube.

Expanders are compact permitting

them to work close to the boiler shell, rivet lines or tubes grouped together. They bear on the end of the tubes; do not draw out of the tube sheet and roll the tube ends for their full length.

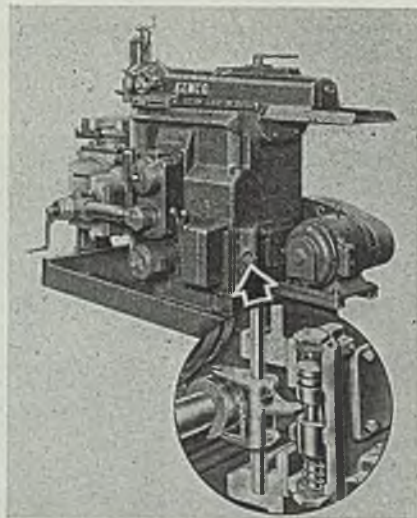
These expanders are manufactured by Richard Dudgeon Inc., 24 Columbia street, New York 2.

Steel 3/25/46; Item No. 9096

Safety Device

Lubrigard safety device, an exclusive feature of Gemco shapers, is offered by General Engineering & Mfg. Co., St. Louis 4.

Function of the device is to automatically prevent the ram of the machine



from being started in case oil supply in reservoir is insufficient; should pressure in the system be below the minimum required, a leak or failure of the oil pressure system occur, filter become clogged, or drive pulley rotation be incorrect.

In addition, it will prevent the clutch control lever from being engaged while the drive pulley is at rest. Therefore, should the motor be started, ram will not move unexpectedly.

Sectional view of the illustration shows how the oil under pressure forces piston down, permitting projection on clutch control lever shaft to clear recess in piston, thereby allowing control lever to move into starting position.

Steel 3/25/46; Item No. 9115

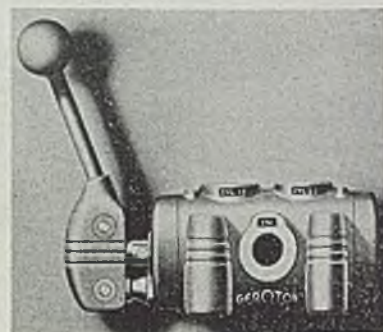
Hydraulic Valve

The new 4-way hydraulic valve announced by Gerotor May Corp., Logansport, Ind., has a "floating piston" design that permits close fitting of the piston in the valve bore and gives maximum sealing ability. Valve stem is supported in its bearings in valve covers without any influence on the piston fit in valve body.

Minimum leakage is gained not only

from this close fit of the hardened and precision ground piston with the valve bore, but also from an "O" ring seal design which prevents exhaust oil from leaking past piston stem. Likewise an "O" ring seal on the valve covers assures positive sealing with no gasket.

Valves are suitable for oil service with pressure up to 1500 psi, and can be fur-

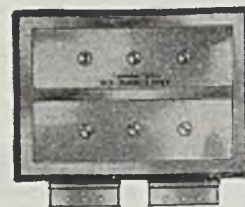


nished for 2500 to 3000 psi oil service. For high pressure water service, valves can be supplied with non-corrosive materials. They are offered with standard, spring return, spring centered, and ball detent action; hand, foot, cam, solenoid, oil pressure and air pressure operation and in $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, 1 $\frac{1}{4}$ and 1 $\frac{1}{2}$ -in. sizes.

Steel 3/25/46; Item No. 9090

Stainless Steel Magnet

A compact, nonelectric magnetic separator with a working surface made entirely of stainless steel is announced by Eriez Mfg. Co., Erie Pa. It offers an efficient means of removing iron and steel trash and ferrous materials from nonferrous metals and alloys, such as zinc, aluminum, magnesium, bronze, brass, copper, etc. It can also be sub-



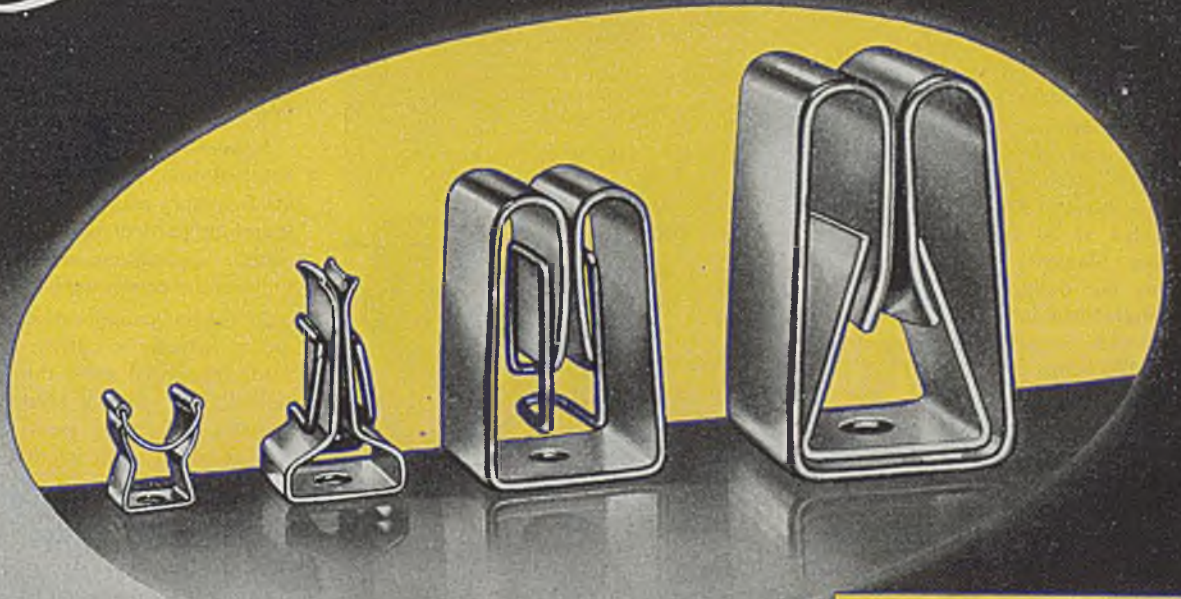
merged in circulatory oil systems to collect ferrous particles in the oil which are hazardous to proper turbine lubrication.

Illustration shows the edge strips and center insulating strip of nonmagnetic stainless steel to prevent strength of the unit from magnetizing the steel on which it is mounted. The two "pulling" areas on each side of the center insulation strip are made of magnetic stainless steel.

The device can be used in liquid or

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 138.)

Positive Pressure FUSE CLIPS



... an exclusive feature of all Square D Safety Switches

What do these fuse clips add to overall safety switch performance? Plenty!

- They reduce heating at contact points by 60%, compared with conventional type clips.
- Copper instead of bronze, they afford substantially more conductivity.
- Lower contact resistance because of higher contact pressure.
- Design permits easy insertion and removal of fuses, notwithstanding the higher contact pressure.
- The Positive Pressure is automatic. It requires no bolts or clamps. It is immune to the loosening effect of vibration, wear or thread stripping.

This is one of many basic features which have placed Square D safety switches in the number one preference spot.

Write for BULLETIN 500 which describes Square D's complete safety switch line and all its features. Address Square D Company, 6060 Rivard Street, Detroit 11, Michigan.



SQUARE D COMPANY

DETROIT

MILWAUKEE

LOS ANGELES

INDUSTRIAL EQUIPMENT

moist materials as well as dry; will not contaminate the foodstuffs, chemicals, acids, liquids, etc., affected by ordinary steel; can be used on outdoor applications without danger of loss of efficiency because of weather; and eliminates possibility of rust scale getting into processing material. Units need no wiring, power being provided by Alnico steel magnet castings.

Steel 3/25/46; Item No. 9099

Incandescent Lamps

Specially designed incandescent lamps for marine, power plant and industrial equipment service where there is constant jar and vibration from heavy or high-speed machinery, are available from Sylvania Electric Products Inc., Warren, Pa. Rated at 50 and 100 w, vibration resisting filaments for vertical lamp burning are designed to give 1000 hr life. Bulb types include clear and inside frosted and are packed in standard package of 120 lamps for 115, 120 and 125 v service.

Steel 3/25/46; Item No. 9082

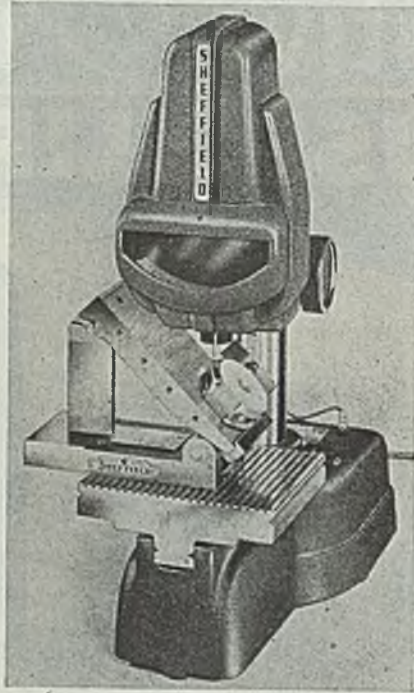
Sine Bar Fixture

The sine bar fixture introduced by Sheffield Corp., Dayton, O., is a device for checking tapered and angular work which requires a high degree of dimensional accuracy. It consists of a serrated work surface hinged to a base plate, the entire fixture being precision made to a tolerance of 0.0001-in. Work surface angle is set by using precision blocks as a reference.

It is available in two sizes, 5 in. and 10 in., respectively, between hinge center and setting bar center. The 5 in. fixture may be used on a visual gage equipped with a 6 in. anvil as shown. Either size

fixture is suitable for use on a surface plate with a height gage.

An adjustable workstop which may be used on either end of the fixture, and an



adjustable backstop usable on either side of the surface plate, are standard equipment.

Steel 3/25/46; Item No. 9119

Pressure Reducing Regulator

The new small and compact Mity-Mite regulator offered by Grove Regulator Co., 6423 East 65th street, Oakland 8, Calif., weighing less than 2 lb and measuring approximately 2 3/4 x 3 3/4 in. is suitable for handling initial pressures up to 3500 lb with adjustable control range from 5 to 1500 lb. Special models can be supplied for higher initial

pressures ranging up to a maximum of 5000 lb. Although primarily designed for air and gases, including hydrogen, nitrogen, oxygen, etc., this unit can also be provided for liquid service. Valve and seat construction was specially engineered for positive dead-end shut-off. Available for 1/8 and 1/4-in. pipe sizes, this unit was originally developed and thoroughly proved in wartime service, where it was employed in controlling actuating medium on rockets and pack type flame throwers.

Steel 3/25/46; Item No. 9024

Remotely Operated Switch

Stevens-Arnold Co., 22 Elkins street, South Boston, Mass., offers switches that are frequency controlled tuned relays and therefore particularly suited for remote control applications with either wire or radio as the carrier medium.

In the radio application, the switches are sufficiently sensitive so that when made on special order they can be controlled from either a crystal detector or vacuum tube type receiver. Response time is only a small fraction of a second.

Each switch is adjusted at the factory to accept a selected band of frequencies in the range of 20 to 800 cycles per second and to reject all others. In other words, one switch might be controlled by the band from 50 to 60 cycles, another by the band from 65 to 75 cycles, another by the band from 80 to 95 cycles, and so on up.

When more than one switch is connected together, the combination provides a means of selective switching by a choice of frequency bands. Range of 20 to 800 cycles is adequate for the control of many separate switches on a single carrier circuit, and by combining the frequency bands in a coded sequence,

FOR MORE INFORMATION on the new products and equipment mentioned in this section, fill in this form and return to us. It will receive prompt attention.

Circle numbers below corresponding to those of items in which you are interested:

9100	9016	9024
9034	9096	9081
9042	9115	9095
9116	9090	9114
9021	9099	9089
9070	9082	9094
9092	9119	

3-25-46

NAME TITLE

COMPANY

PRODUCTS MADE

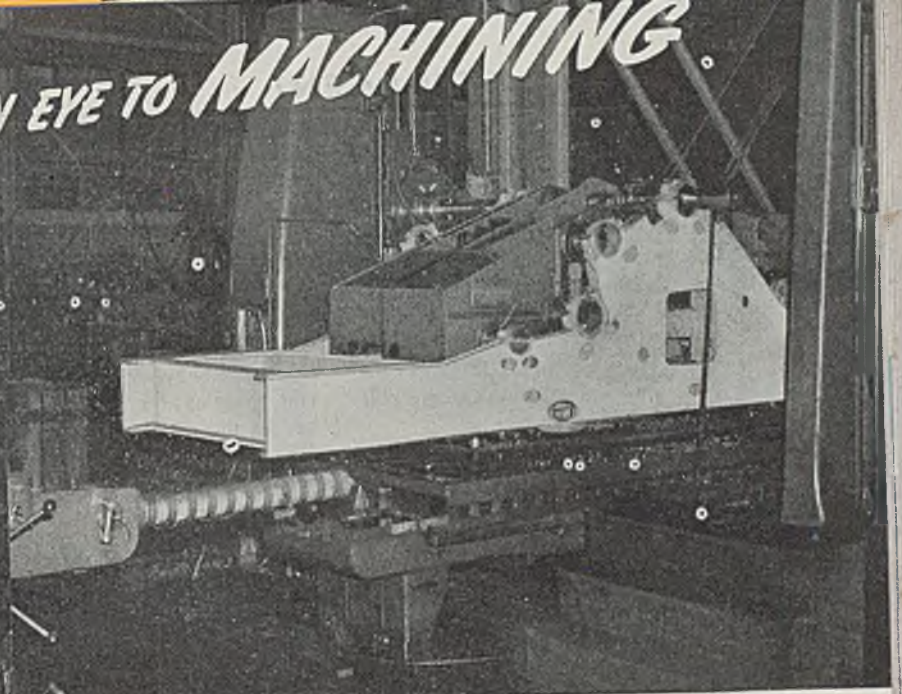
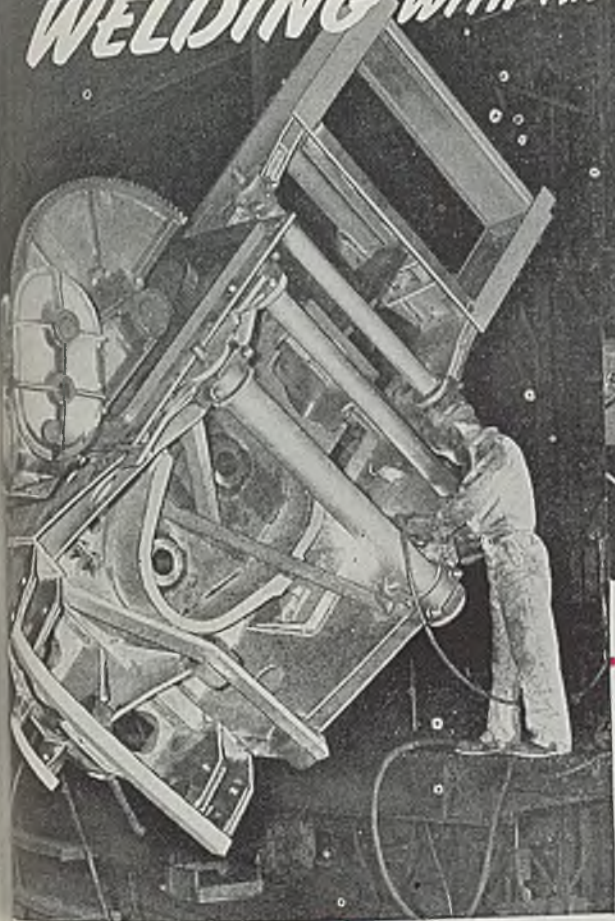
STREET

CITY and ZONE STATE

Mail to: STEEL, Engineering Dept.—1213 West Third St., Cleveland 13, Ohio

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

WELDING WITH AN EYE TO MACHINING



“Know How”

makes the hard jobs look easy!

● Sub-assembly construction makes for ease in welding and handling the smaller units. Push-button control on positioner and platform combination (*shown above*) insures faster down-hand welding at all points on the structure.

On the horizontal boring mill (*right*) the same part is nearing completion. Twenty-four holes bored—twelve holes spotfaced

and backfaced—from the same side, using a bar-holding fixture, obviates reversing the job or changing setup.

Danly facilities combined with Danly “know how” gained in over fourteen years of heavy weldment production make the hard jobs look easy—produce accuracy in the weldments that leads to faster machining—complete the job at lower final cost.

DANLY MACHINE SPECIALTIES, INC. • 2100 South 52nd Avenue, Chicago 50, Ill.

DANLYWELD

Welded and Machined at Lower Final Cost

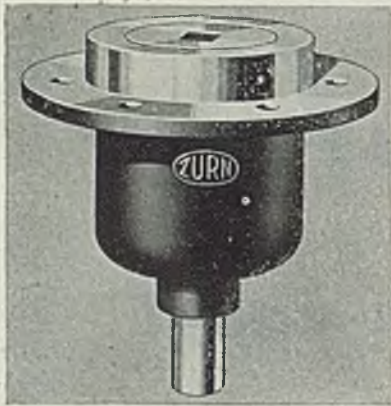
any number of selective switching operations can be obtained.

Ratings of 1 to 10 amp, 115 v ac are available. Seven binding posts are supplied. One set of binding posts is for the selected-frequency ac, required to control the switch. Another set is for the auxiliary power, required to operate the switch. The remaining three are the switch terminals, this being a single pole double-throw model.

Steel 3/25/46; Item No. 9081

Control Assembly

A remote valve control assembly has been developed by J. A. Zurn Mfg. Co., Erie, Pa., that provides a greater margin of pipeline safety by facilitating immediate control of valves in hard-to-get-at places. From one control board valves can be opened and closed with a minimum of delay. These assemblies easily



operate and control valves located below floor level, close to the ceiling or walls and partitions, inside tanks or processing vessels, or in the midst of complicated installations of piping and equipment. It consists of a flexible cable, for transmitting torque to the handle of the valve to be operated, or a rod or pipe connected by universal joints; a remote valve control box, cover of which can be engraved to identify the type of valve it operates; sleeve bushings, terminal brackets, cable clips and a rod coupling for the valve wheel.

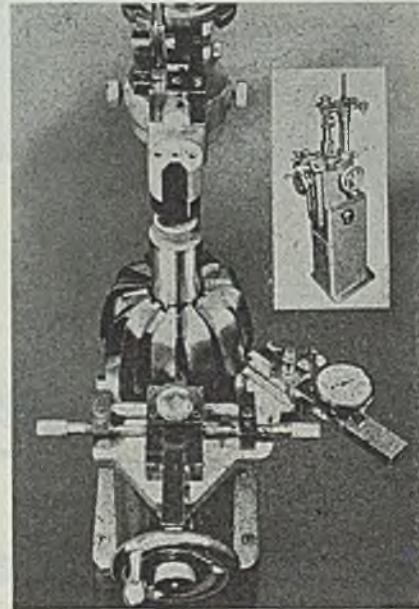
Steel 3/25/46; Item No. 9095

Tool Checker

Originally available for checking of tooth spacing and hook or rake angles on thread milling cutters, the simple type of "hook checker" developed by Detroit Tap & Tool Co., 8432 Butler avenue, Detroit 11, is now available for universal checking of all types of form-relieved tools. Such relieved-form tools can be checked for sharpening accuracy on this tool checker without the use of gage

blocks, surface plates, vee blocks, indicator stands, etc., for setting up different sizes and types of tools.

Checker is of the visual alignment type. Circular form tools, thread buttons, gear cutters, hobs, reamers, and form relieved milling cutters are some of the cutters which can be checked by simply placing the cutter between the adjustable centers and bringing the ground knife edge against the cutting face of the tool until operator cannot see light between the two. An integral micrometer barrel indicates exact offset distance of cutting



face from center line of the tool. Reference to a simple table supplied with the machine quickly converts this reading, if desired, to rake angle for the diameter of the tool being checked. Flute spacing checking is just as easy.

Steel 3/25/46; Item No. 9114

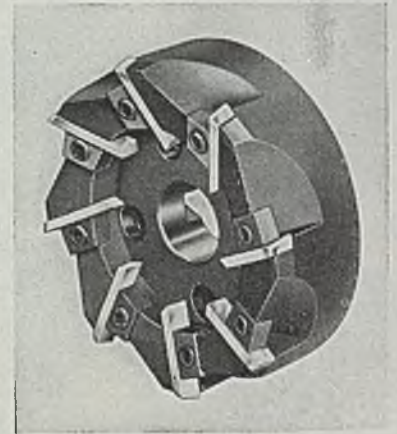
Milling Cutter

Kennametal Inc., Latrobe, Pa., has developed a new type of milling cutter, designated as the Universal face Kennamill, which consists of a precision built heat treated steel body, or tool holder, with a set of detachable solid blades (as many as there are inches in the cutter diameter) mechanically held in position.

Five standard sizes are now available—4, 6, 8, 10 and 12 in. diameter. Blades for these are of same cross section, and when shortened by regrinding, can be used in smaller cutters successively. They are "formed" at both ends, and can be used in either right or left hand cutters.

Blades are wedged in the body at fixed angles, 15° dish, or concave 7° negative axial, and 15° positive radial. In this condition, cutter is suitable for milling light alloys. Effective radial rake is

changed to 10° positive for cast iron, and 7° negative for steel, by grinding a narrow land on the working edge of the blade at the required angle. True cut-

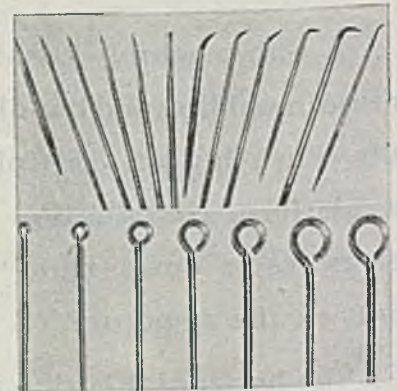


ting angle in each case is, however, the resultant of axial, radial, and nose components, that is, 14° positive for light alloys, 8° positive for cast iron, and 8° negative for steel.

Steel 3/25/46; Item No. 9089

Deburring Tools

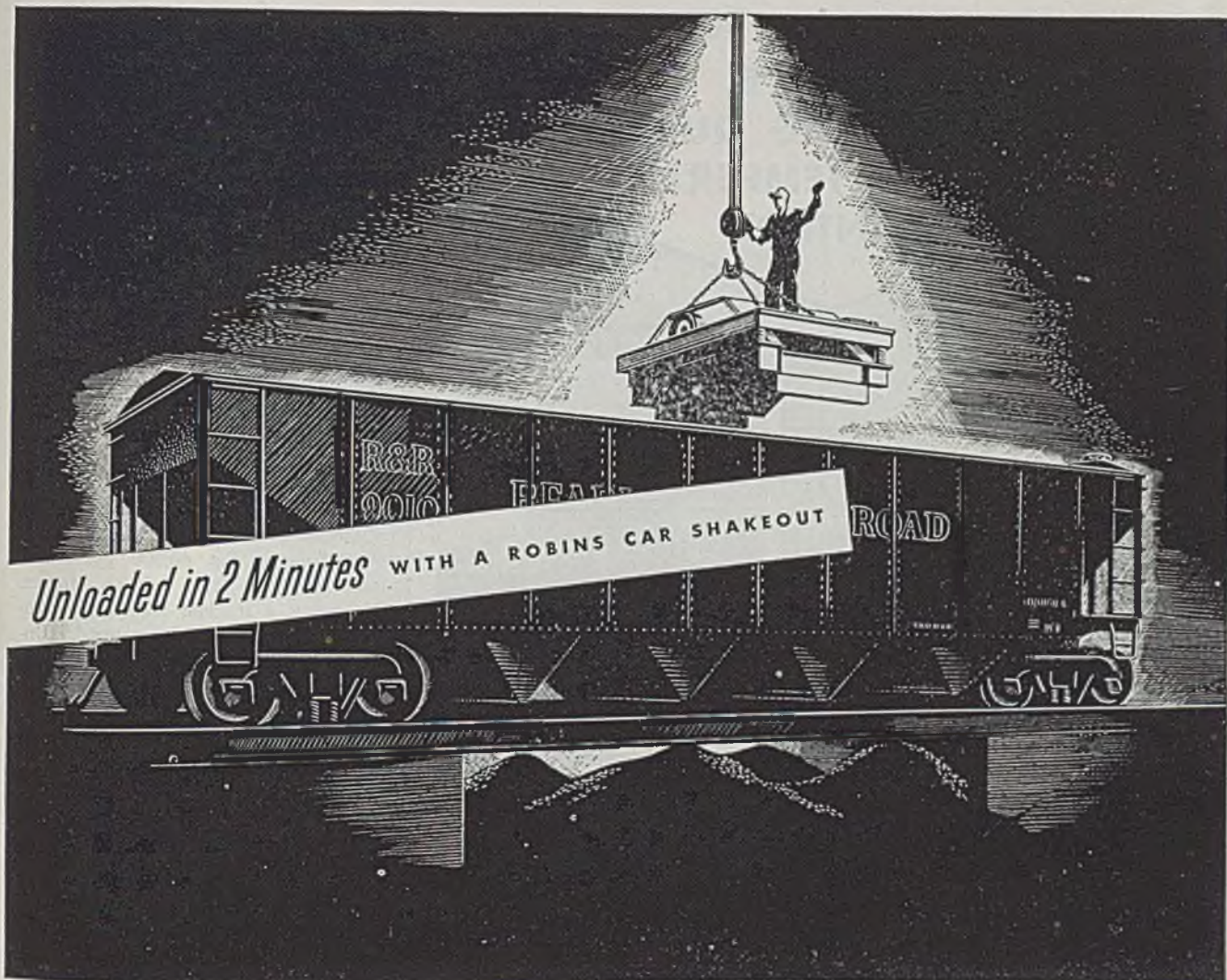
A new line of hand-forged deburring tools, announced by Metal Products Co., South Bend 24, Ind., features seven distinct types, each in varying sizes. Channel knife type comes with sharp or square point to remove burrs from long channels and holes in machined castings. For deep holes or cross channels, there are 45 and 90-degree angle hooks, as well as radius-



curved ends, in long or extra-long sizes. Series F straight scraping tool is useful for general scraping jobs, but is recommended particularly for removing exterior burrs on machined castings. A "button hook" shaped deburrer comes in seven separate graduations. The complete line is made of fine tool steel, unimpeded operating shafts from 4/4 to 9 in. in length, hollow-ground, hardened, and specially tempered.

Steel 3/25/46; Item No. 9094

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 138.)



Only 2 minutes were required to empty a packed coal car using the exclusive *New Robins Car Shakeout*.

This is just one example of how this amazing "Job-Engineered" 1st, pioneered and developed by Robins, can help you save time, money, and equipment.

Operating at high speed, this machine literally shakes a load of tightly packed coal, coke, or ore through the hopper doors at the bottom of a railroad car—just as though a pair of giant hands picked up the car and shook it. Records of less than two minutes per car are by no

means uncommon, and two men can do the work that previously required six or more.

No elaborate installation equipment or housing is required. Actually, you can use a Robins Car Shakeout anywhere a 5-ton hoist can be installed. In addition, this new Robins product does not injure cars or unloading facilities in any way.

A note or phone call will bring complete literature or a "Job-Engineer" to your desk to give you all the facts on how this exclusive *New Robins Car Shakeout* can help solve your hopper-car unloading problems.

AMERICA'S ONLY COMPLETE MATERIALS HANDLING SERVICE

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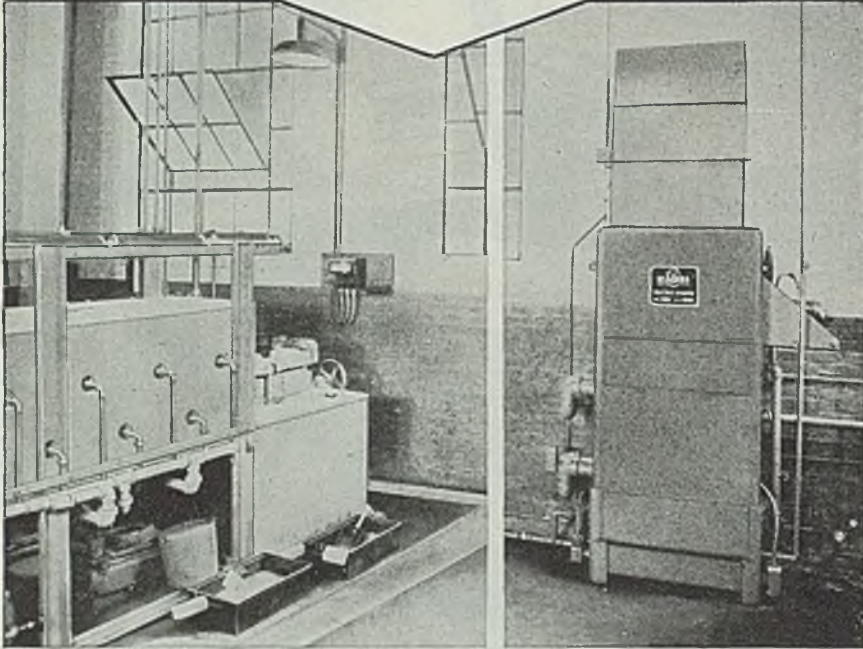
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Steam Hammer

(Concluded from Page 121)

approximately 3/16-in. deep from surface of ram taper inward and extending to a point slightly above the end of taper. If desired, a rod may be produced which is surface hardened throughout its entire length.

Effect of this hardened case is to produce a compressive stress in the skin which aids in counter-acting tensile stresses which develop and which lead to service fatigue failure. For example, if surface tensile stress during service is approximately 40,000 psi, (if repeated, this would cause progressive failure) and if hardening process induces a compressive stress of 60,000 psi in surface metal, the 60,000 psi compressive stress induced by the surface hardening treatment will counterbalance the 40,000 psi tensile stress resulting from service stresses. This leaves a residual 20,000 psi compressive stress in surface material. Under such conditions fatigue fractures will not occur.

A typical hardened rod will show a hardness through the cross section of 495 BHN on the surface, 302 at a depth of 1/4-in., 295 at 3/4-in. depth, and 285 at center. Protective hardening of ram taper surface does not change the ductile, yet high strength center portion which is necessary to withstand impact stresses.

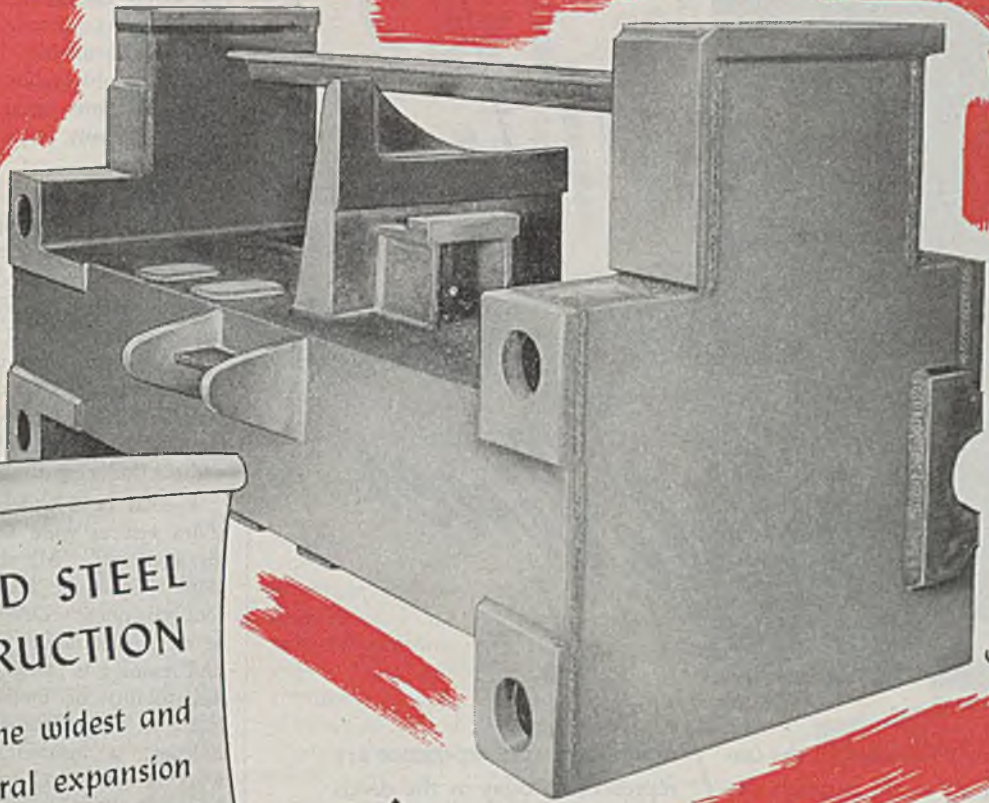
Rods have been tested in steam hammers having from 8000 to 35,000 lb capacity. At one drop forge company, where a 10 in. diameter conventional rod averaged 210 working hours in a 35,000 lb hammer, the induction surface hardened rod served for 598 hr. At another plant, installed in a 12,000 lb hammer, piston rod served for 434 hr as contrasted with a 254 hr average life for conventional piston rod. Less surface galling also was noted.

Water-Cooled Batteries Available for Welders

A line of battery-powered resistance welders is available with internally water-cooled storage batteries, according to Progressive Welder Co., 3050 East Outer drive, Detroit.

Cooling of the cells is accomplished by use of approximately 50 in. of 1/4 in. OD lead tubing in electrolyte near the top of cells. Tap water is circulated through tubing which is insulated from the plates by insulators of hard rubber, and is kept from contact with the terminals by being enclosed in rubber sleeves at these points. Automatic control of battery voltage through automatically variable charging rates reduces electrolytic generation and escape of hydrogen.

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TWIN DISC CLUTCH CO., Racine, Wis.
Hydraulic Division, Rockford, Illinois

Camless Automatic

(Concluded from Page 91)

of the machine, in which also is located the sliding shift lever for setting the spindle speed. This high and low range gear offers two spindle speeds for each pair of gears. For each spindle speed there are available 18 rates of feed. These are obtainable through a quick-change selective gear box, thus eliminating necessity for separate, loose feed change gears.

Another feature of this machine intended to reduce setup time and at the same time to maintain flexibility of operation, is to be found in the design of the cross slides. Each spindle is served by a cross slide. These slides are equipped with micrometer adjustments, easily read and accurate to 1/10,000-in., and they have a disconnecting arrangement which permits full tool slide action without indexing the spindle carrier.

A total of 8 independently operated slides insures wide flexibility of tooling arrangements. All slides have positive stops. Tools are interchangeable in all tool positions. Drilling may be done at all five stations. Tapping, threading and reaming is possible at three stations. Accessibility of tooling, an important factor in the obtainment of operator efficiency, is insured because sufficient working space and tool clearance is inherent in the basic design.

Shockless Bar Feed

Rapid but shockless feeding of the bar stock is achieved because of the uniform acceleration and deceleration involved. The bar feed stroke is variable between 0 through 10-in. by a screw adjustment, which makes it simple to attain shock-free contact with stock stop when the machine is in operation.

A two-pump coolant system is used, one coolant being for the "open" tools, the other for combined cooling and chip ejection in drilling operations, reaming, etc. This high and low pressure pump system can thus be utilized to suit the type of cut being made. The problem of chip disposal has also received special attention. A large chip collecting area beneath the working stations and absence of working mechanisms in this area facilitates their disposal. A chip conveyor is provided which mechanically feeds the chips into a container at the "headstock" end of the machine. It is equipped with a safety clutch to avoid breakage should the conveyor become jammed.

Two sizes of the machine are available, for 1 3/4 and 2 1/4 in. bar stock respectively. A similar machine for chucking work is included in the line, its five spindles having 6 in. chucks.

Friction Sawing

(Continued from Page 97)

revolves. This accounts for the fact that tooth fitness is retained virtually for the duration of saw flex life.

Heat penetration, into the side wall of the finished cut, is almost negligible, slightly increasing in depth as thicker materials are cut. This can be readily appreciated when we bear in mind that the cutting rates are slower on thicker sections and that the opportunity for greater heat penetration is subsequently present. Heat penetration, due to friction sawing, is inherently less than that produced by flame or torch cutting.

In general, only two effects of heat penetration can be found when cutting ferrous metals that respond to heat treatment.

In the case of untreated materials that respond to air hardening techniques, that material immediately adjacent to the cut will be found to have an extremely thin skin hardness due to the temperatures reached by friction. Since the material in this case responded to air quenching, the air entrained in the rapidly moving saw cools the material rapidly enough to cause minute skin hardness that can be detected only by the time-honored file test, since the zone of hardening is so thin that usual testers of the superficial rockwell type etc., do not give measurements.

Behind this zone of hardness will be found a very narrow annealed area, so small that in all cases it is not objectionable. In fact, on those jobs where heat distortion due to machining is a problem, friction sawing will do an excellent job.

In the case of heat-treated materials, those that do not react to air quenching, only a very narrow zone of annealing will be found similar to that just mentioned.

Tooth sharpness is not a controlling factor and is even a drawback to sawing by friction. It is for this reason that a new band reaches its maximum efficiency only after 10 to 20 min of cutting; until then the teeth are not sufficiently "dulled" to create the higher temperatures necessary for maximum friction cutting rates.

As it is possible to friction saw through welds and hardened high-speed steel, the degree of hardness of the metal is immaterial. Although present maximum cutting rates still apply to thickness under ½-in., more progress in this direction is to be noted. A cutting rate of approximately 13 linear inches per minute is now possible on ¾-in. armor plate.

Some recent applications and improved results obtained with friction sawing amply demonstrate the possibili-



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ties of the cutting medium at increased speeds on greater thicknesses, yet attaining ever higher linear rates. In all cases cited in following paragraphs saws are "Raker" set and "A" temper, with a 0.42-in. set for ½-in. saws, and 0.055-in. set for 1-in. saws. Saw life of 25 hr continuous cutting is not unusual. The burr resulting from friction sawing is slight and surface hardness is negligible.

A-Manganese Steel: A 10 per cent steel is so tough that, like armor plate, it cannot be sawed economically at low velocities. However, a ½-in. 14-pitch saw working at a speed of 5000 fpm gives a cutting rate of over 9 lineal inches per minute on a ⅜-in. thickness of this material. Rate is at least five times that possible under standard velocity of 175 fpm for this application, and the increase in saw life is proportionate.

B-Nickel Steel: In friction sawing a ⅜-in. thickness of 80 per cent nickel steel at 9000 fpm, the production rate averages 70 lineal inches per minute, with a 1-in. 10-pitch saw. Conventional speed in this case was 75 fpm, with a ½-in. 14-pitch saw and a cutting rate about one-half that of friction sawing operation.

C-Lead Coated Steel Sheets: In sawing 20-gage lead coated steel sheets at 200 fpm, maximum cutting rate is less than 90 lineal inches per minute, but this is stepped up to a 600 or 700 per cent production increase by friction sawing at 6000 fpm with a 14-pitch saw.

D-Non-Magnetic Steel: A cutting rate of 50 lineal inches per minute is possible on a ¼-in. non-magnetic steel, with a 10-pitch saw operating at 5000 fpm.

E-Stainless Steels: The stainless steels more and more are becoming friction sawing application due to the substantial increase in cutting rates over other methods. On ⅜-in. sheets, close to 400 lineal inches per minute are made possible with a ½-in. 24 pitch saw at 8000 fpm. The rate on a ⅜-in. thickness, with a 14-pitch saw operating at 6000 fpm, averages 100 lineal inches per minute. A ⅜-in. thickness of stainless steel may be cut at 8000 fpm with a cutting rate of close to 40 in. One-half, ¾ and 1-in. and thicker stainless steels may be friction sawed efficiently at velocities up to 12,000 fpm, the speed being increased commensurate with increase in thickness.

Generally speaking, friction sawing is not practical for cutting stacked parts because there is a tendency for the stacked parts to weld together at the kerf while in the plastic state. Nevertheless, the medium can be applied to stack cutting stainless sheets with fair expectations of success, providing the maximum cutting rate is not employed. Yet even the reduced rate is far faster than those obtained in standard sawing

applications. Four sheets of 18-gage stainless may be friction sawed efficiently with a 14-pitch saw at 5000 fpm. One can easily reduce regular feeding pressure 50 per cent and yet double the single-sheet cutting rate.

F-Pipe and Tubing: Obviously the cutting of pipe or tubing presents a different problem than that of flat stock, due to cross-sectional variation from a zero outer wall thickness which gradually increases to its inner wall maximum. It, therefore, is imperative to limit maximum wall thickness per given diameter to which friction sawing may be applied. This varies from ¼-in. wall thickness for 1½-in. diameter tubing to a ⅜-in. wall thickness for 12-in. diameter stock.

Speeds for friction sawing pipe and tubing do not vary as much as they do for flat material. For example, ⅝-in. armor plate is cut at 3000 fpm and ½-in. at 13,000 fpm, whereas the difference between a 4-in. diameter ¼-in. wall tube and one of 1½-in. diameter and ⅜-in. wall is only 2000 fpm.

Recommended pitch for thinner walls is 14, and for thicker section it is 10. Speeds have been established at from 8000 to 10,000 fpm. Twenty cuts per minute are possible on 3-in. tubing with ⅜-in. walls, with an increase to 30 cuts per minute on 2-in. and a decrease to 15 on 4-in. tubing of identical wall thickness.

As for the method of feeding work and pressure, these factors also are at variance with conventional practice. Some of the thinner materials will cut as fast as they can be pushed through the saw by hand. The general rule is the thicker the cut, the heavier the pressure required to feed work. No one can govern these conditions better than an experienced operator. Materials over ½-in. thick usually are cut more satisfactorily where there is a hydraulic feed.

A very great advantage afforded by friction cutting with a band saw is the ability of the method to produce accurate contour work.

The possibilities of high velocity friction sawing have been considered only briefly in this article, but there is little question that the technique has revolutionized band sawing practice, and more information will be forthcoming.

—o—

An illustrated bulletin describing All-cast aluminum alloy, giving its history, principal advantages and mechanical properties has been produced by National Smelting Co., 6700 Grant avenue, Cleveland 5. Properties are substantially the same as the following two types of alloys: AN QQA 376, SAE 322 ASTM SC 21,—(355 type); and AN QQA 394, SAE 323, ASTM SC 1,—(356 type).

March 25, 1946

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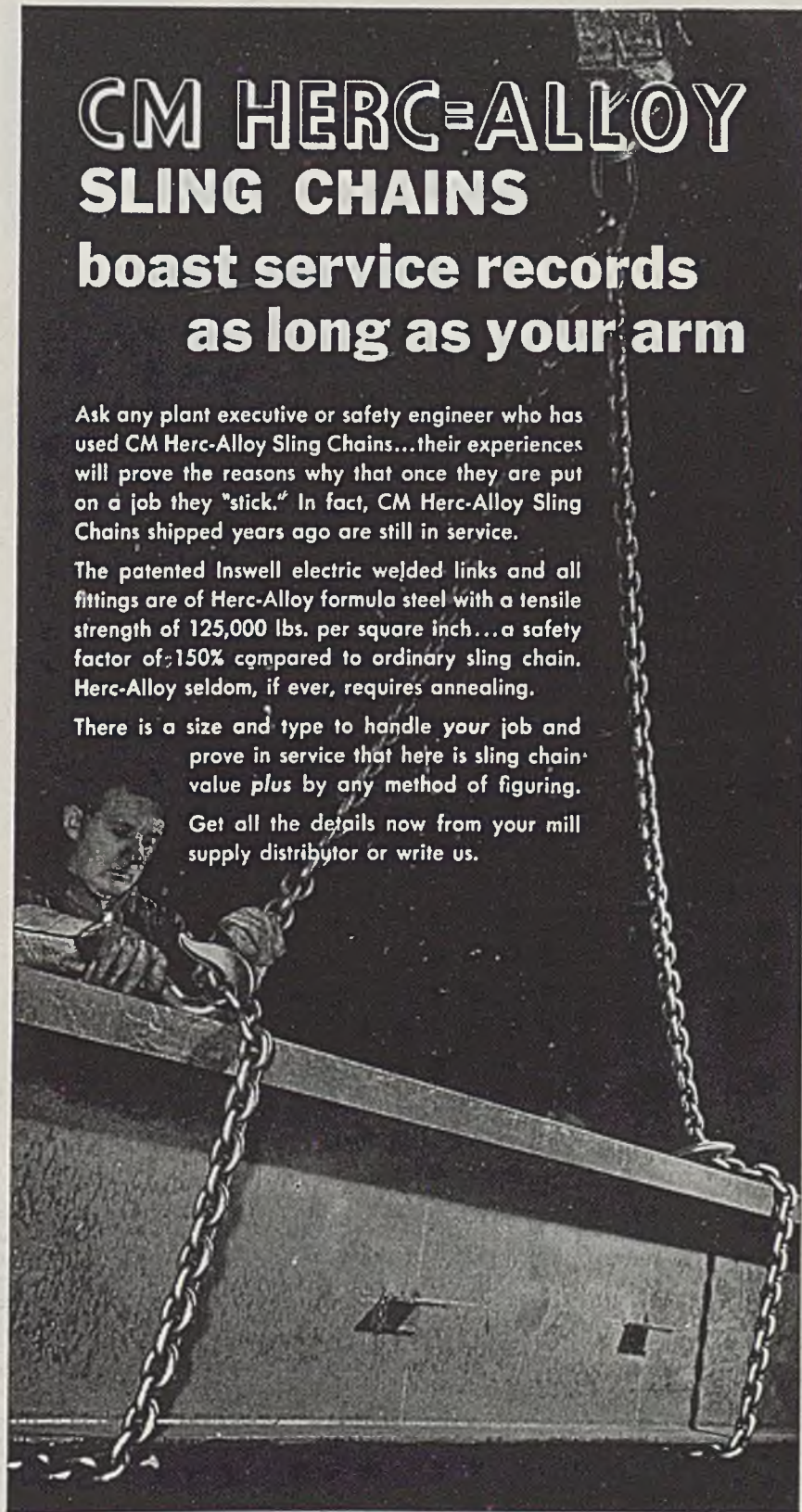
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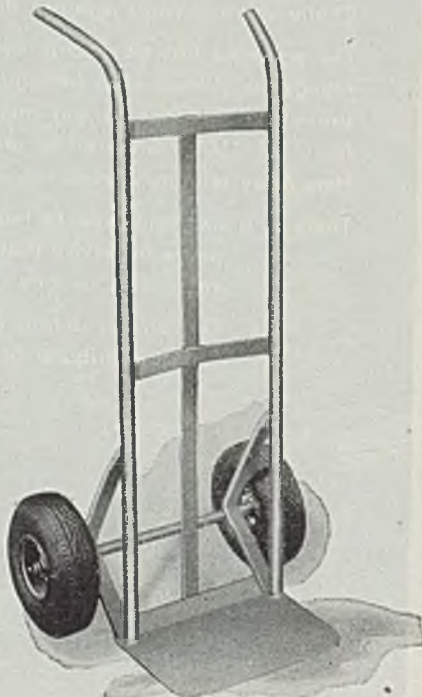
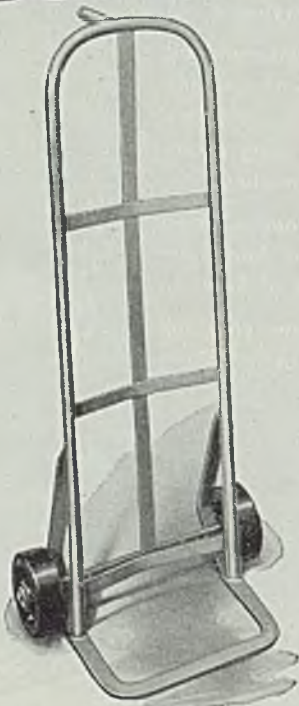
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AGH—Demountable Cushion rubber wheels . . . it's tough. MOCH—Moulded on Cushion Rubber Wheels, moulded to metal core. ABK—Plastic wheel with laminated fabric tread, moulded under heat and pressure. MRK—Resinoid Wheels made of sturdy canvas duck, macerated and moulded under heat and pressure. Plain or Roller Bearings. NICHOL STEEL—Fine quality grain castings, fully machined. Oilite Bearings, zerk lubrication. GP—General Pneumatic with 10" x 3.50" demountable rubber tires.

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Welding Electrodes

(Continued from Page 100)

the downhand position to judge the response in groove welding where some different conditions are faced. Results are listed below:

$\frac{1}{8}$ x 14 in. electrode	Lime	Titania	AC-DC
Best current	150A 22V	180A 22V	185A 25V

As was the case with the horizontal fillet welds, the groove welds of Fig. 2 were rated on five points: Arc stability, smoothness of bead, shape of bead, slag removal and spatter loss.

Arc Stability — In the groove, all arc performances were quite good making the eventual rating a difficult problem. Agreement was reached in the following order of preference: AC-DC, titania and lime.

Smoothness of Bead — AC-DC coatings provided the smoothest bead judged by ripple spacing primarily. Titania was close behind with the lime coating yielding a more coarse but uniform bead.

Shape of Bead — Multipass groove welding depends upon the shape of the weld bead for sound deposits. The ideal bead is slightly concave as was the AC-DC deposit. Second choice would be a flat bead, such as was produced by the titania coating. Some objection may be raised against a slightly convex bead because of the danger of slag entrapment along the sidewalls. The lime coating produced a slightly convex bead in the root.

Slag Removal — Slag removal was evaluated in the root pass after the welds had cooled. Slag chipping with some types of stainless steels is quite a chore. Power tools must pound away at the slag for quite a while under certain joint conditions. Cold slag from dry coatings is the easiest to remove. Using hand tools throughout AC-DC slag came free with surprisingly little effort. Lime type slag was a second choice and titania was third.

Spatter Loss — On this point, agreement was difficult because the 19-9 electrodes produce so little spatter. Final rating took this form: AC-DC, lime and titania.

Two factors in connection with stainless steel electrode coatings and welding characteristics have been noted by fabricators with respect to most brands. First is the presence of small surface porosities at the beginning of a bead. This defect is shown in Fig. 3. It is caused by slightly wet coatings. Stainless electrodes pick up some moisture from the atmosphere rather quickly after removal from the package. Pinholes in the weld surface provide a clue along with increased difficulty of slag removal. Fortunately, the remedy is quite simple.

Drying electrodes at 300° to 400° F for about an hour before use solves both problems. Any oven will do the job. One welding foreman took some electrodes home and put them in the kitchen stove to prove the point, using a simple glass thermometer to check the temperature.

Commercial stainless steel welding electrodes have come out of the war with noticeably improved coatings. The newest variety, the AC-DC coating, will undoubtedly take the place of the titania coating, leaving industry with two basic types: AC-DC (really a more stable titania type) and lime. Present practice seems to favor the AC-DC coating for most positioned applications and the lime type for vertical and overhead welding. This simplification of the position of the two electrode coatings should not be construed to imply an inability on the part of the AC-DC electrodes to work well vertical and overhead as they do.

A substantial proportion of stainless steel fabrication exists in light gage work where the greater arc stability of the AC-DC coating in the small diameters used is extremely helpful. This same coating provides a more fluid deposit merging into the parent metal with extraordinary smoothness, thereby reducing the amount of metal to be removed during grinding and polishing operations. Cost reductions are a natural aftermath.

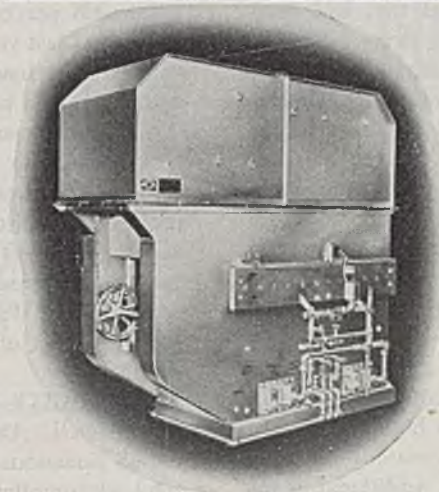
Heavier fabrication including pressure vessel work for the chemical industries lends itself to the concave deposits provided by the AC-DC coatings. Here ease of cleaning and x-ray sound welds are involved.

Plants reconverting to stainless fabrication will want to try the newest coating designs to profit by the definite betterment of stainless steel electrode coatings resulting from the huge volume of stainless welding required by the war effort.

Coal Conveyor Built for Installation in Paris

Work on a coal handling system to replace the one bombed out in Paris, is scheduled to be completed in April by Robins Conveyors Inc., 270 Passaic avenue, Passaic, N. J. Equipment was designed for the Gennevilliers power station of the Union d' Electricite. These conveyors are designed to ultimately handle 500 tons per hour and will handle 150 tons per hour when begin to operate about a year from now. Equipment consists of one main belt conveyor, 249 ft long and 42 in. wide, four other belt conveyors of various widths whose total length is 311 ft and motor driven dust sealed trippers to control the direction of flow.

4 CLEANING CYCLES With the Detrex 500-C-1



The latest addition to the line of Detrex standard solvent-vapor degreasers—the 500-C-1—permits the use of any one of four cleaning cycles. One of these is sure to be the correct answer to your vapor-degreasing problem.

1. Vapor
2. Immersion in Cool Solvent—Vapor
3. Vapor—Immersion in Cool Solvent—Vapor
4. Immersion in Boiling Solvent—Immersion in Cool Solvent—Vapor

These phases may be combined to form a cleaning cycle to fit any production requirement.

While retaining the advantages of the larger models, this conveyerized degreaser conserves valuable floor space. The machine, available in six sizes, has a large hourly-rated work load capacity. The 500-C-1 is designed primarily for flexible production cleaning. Baskets are loaded at one end of the degreaser, move through the required cleaning cycle, and are returned to the same end of the machine for unloading.

All standard Detrex degreasers are available corrosion-resistant clad or with zinc-spray coated interior surfaces.

Perm-A-Clor or Triad degreasing solvents—depending on your particular requirements—are recommended for use in the 500-C-1.

E-112



the BUSINESS TREND

IN recovering from strikes, industry has pushed production slightly above the highest level that had been attained between V-J Day and the steel strike. For the week ended March 16, STEEL's industrial production index registered 126 per cent (preliminary). Highest previous point since V-J Day was 124 per cent in the week ended Nov. 17.

Most of the recent climb in the rate is due to recovery in steel and automobile production, both of which in the week ended March 16 reached their highest points since V-J Day. Steel ingot production, which during the recent strike in the steel industry was throttled to 5.5 per cent of capacity, has bounded to the high 80s.

AUTOS—A 51 per cent increase within a week sent automobile production in the week ended March 16 to 35,020 units, 695 cars more than the previous high mark since V-J Day. Most of the latest week's increase came from resumption of work by Ford Motor Co. Additional jumps in production soon will come as General Motors Corp. plants resume work.

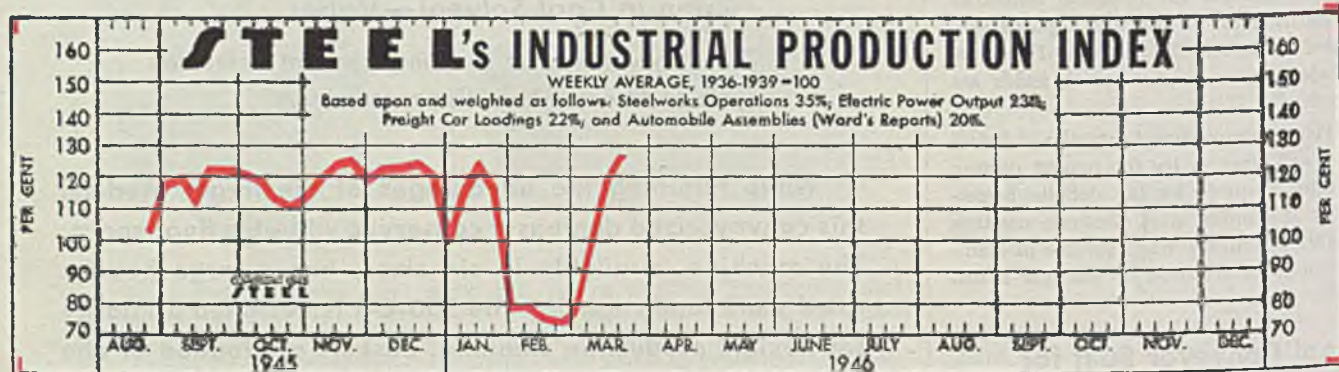
COAL—A new high for bituminous coal production this year was set in the week ended March 9 when estimated output was 13 million tons. This put this year's cumulative production 4.5 per cent ahead of that for the corresponding period last year.

CARLOADINGS—This high production of coal has

helped keep railroad carloadings thus far this year to within 4.5 per cent of total loadings in the corresponding period last year. In the first nine weeks of 1946, revenue freight loadings totaled 6,532,727 cars, compared with 6,841,878 in the corresponding period of 1945. Although there were decreases in some classes of loadings, coal loadings in the nine-week period of 1946 increased 7.7 per cent over the like period of last year. A current problem of railroads is to provide sufficient box cars to carry grain and grain products. As the government's grain export program extends to June 30, following which harvesting of 1946 grains will start in volume, there is little prospect of near-term improvement in the box car supply.

ELECTRICITY—Consumption of electric power is holding up well. Despite strikes that in recent weeks have closed numerous plants of electric power consumers the total consumption thus far this year is only 11 per cent less than in the corresponding time last year when industry was pushing war production to the limit.

CONSTRUCTION—Although off slightly from the two immediately preceding months, the volume of building permits issued in February was, with the exception of December and January, the highest since October, 1929. The February total for 215 cities was \$198,698,543, down 2.6 per cent from January.



The Index (see chart above):

Latest Week (preliminary) 126

Previous Week 119

Month Ago 74

FIGURES THIS WEEK

INDUSTRY

	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)	84.5	77.5	5.5	95
Electric Power Distributed (million kilowatt hours)	3,988	3,953	3,949	4,398
Bituminous Coal Production (daily av.—1000 tons)	2,167	2,083	2,073	1,802
Petroleum Production (daily av.—1000 bbls.)	4,415	4,403	4,710	4,774
Construction Volume (ENR—Unit \$1,000,000)	\$74.8	\$68.4	\$44.1	\$40.8
Automobile and Truck Output (Ward's—number units)	35,020	23,050	21,555	20,505

*Dates on request.

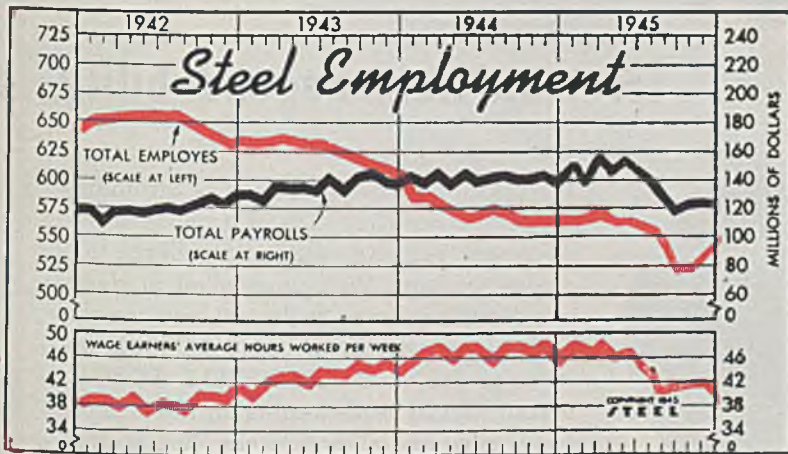
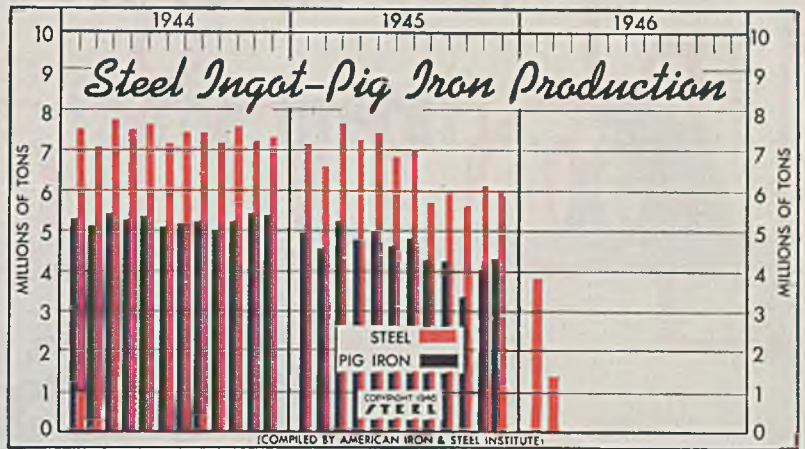
TRADE

Freight Carloadings (unit—1000 cars)	796†	786	707	816
Business Failures (Dun & Bradstreet, number)	17	22	25	16
Money in Circulation (in millions of dollars)†	\$27,946	\$27,957	\$27,967	\$25,881
Department Store Sales (change from like wk. a yr. ago)†	14%	+19%	+25%	+28%

†Preliminary. †Federal Reserve Board.

Iron, Steel Production
(Net Tons—000 omitted)

	—Steel Ingots—		—Pig Iron—	
	1946	1945	1944	1945
Jan.	3,869	7,206	7,593	4,945
Feb.	1,354	6,655	7,194	4,563
Mar.		7,708	7,826	5,228
April		7,292	7,594	4,786
May		7,452	7,703	5,016
June		6,842	7,234	4,605
July		6,987	7,498	4,812
Aug.		5,736	7,499	4,249
Sept.		5,983	7,235	4,227
Oct.		5,598	7,621	3,388
Nov.		6,201	7,279	4,026
Dec.		6,059	7,366	4,323
Total	79,719	89,642	54,167	62,866



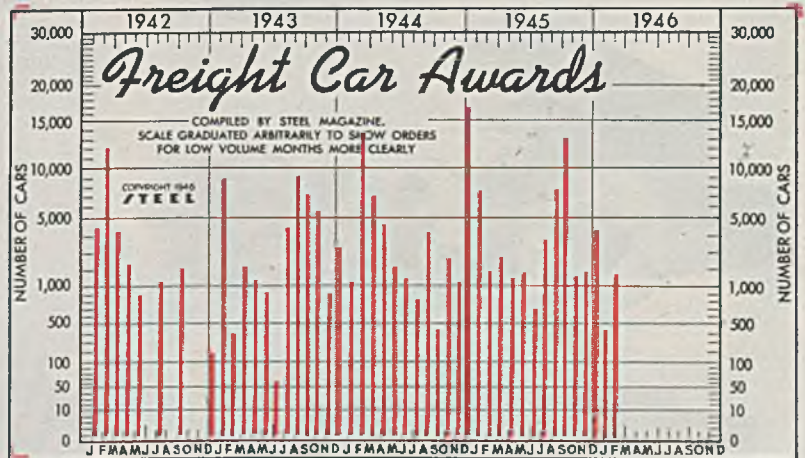
Steel Employment

	—Employees—		—Total Payrolls—		
	(000 omitted)	1945	1944	1943	1945
Jan.	564	583	637	\$150.3	\$141.8
Feb.	566	583	635	138.4	137.6
Mar.	570	578	637	155.0	145.3
April	567	573	634	147.0	138.9
May	565	569	632	154.0	145.4
June	562	570	631	144.1	140.5
July	557	571	627	141.0	141.8
Aug.	543	569	625	128.1	143.9
Sept.	521	565	620	119.1	142.2
Oct.	522	564	615	121.3	141.7
Nov.	533	564	611	122.8	143.1
Dec.	545	564	605	122.5	139.9

† Monthly average; previous reports showed total number regardless of whether they worked one day or full month.

Freight Car Awards

	1946	1945	1944	1943
Jan.	420	7,200	1,020	8,385
Feb.	1,795	1,750	13,240	350
March		2,500	6,510	1,935
April		1,120	4,519	1,000
May		1,526	1,952	870
June		670	1,150	50
July		3,500	795	4,190
Aug.		7,240	3,900	8,747
Sept.		12,840	400	6,820
Oct.		1,320	2,425	5,258
Nov.		1,650	1,065	870
Dec.		4,116	16,245	2,919
Total	45,432	53,221	41,374	



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	\$11,119	\$12,023	\$10,459	\$10,485
Federal Gross Debt (billions)	\$278.6	\$278.7	\$279.5	\$235.3
Bond Volume, NYSE (millions)	\$23.8	\$24.5	\$30.3	\$52.5
Stocks Sales, NYSE (thousands)	5,923	5,226	7,581	4,503
Loans and Investments (billions)†	\$67.7	\$68.1	\$68.2	\$58.4
United States Gov't. Obligations Held (billions)†	\$49,231	\$49,518	\$49,716	\$43,977

*Member banks, Federal Reserve System.

PRICES

	Latest Period*	Prior Week	Month Ago	Year Ago
STEEL's composite finished steel price average	\$64.45	\$64.45	\$58.27	\$57.55
All Commodities†	108.2	107.6	107.1	105.1
Industrial Raw Materials†	121.4	119.5	119.3	116.2
Manufactured Products†	103.8	103.7	103.2	101.8

†Bureau of Labor Statistics Index, 1926 = 100.

Forgings

by **TITUSVILLE**

for maximum dependability

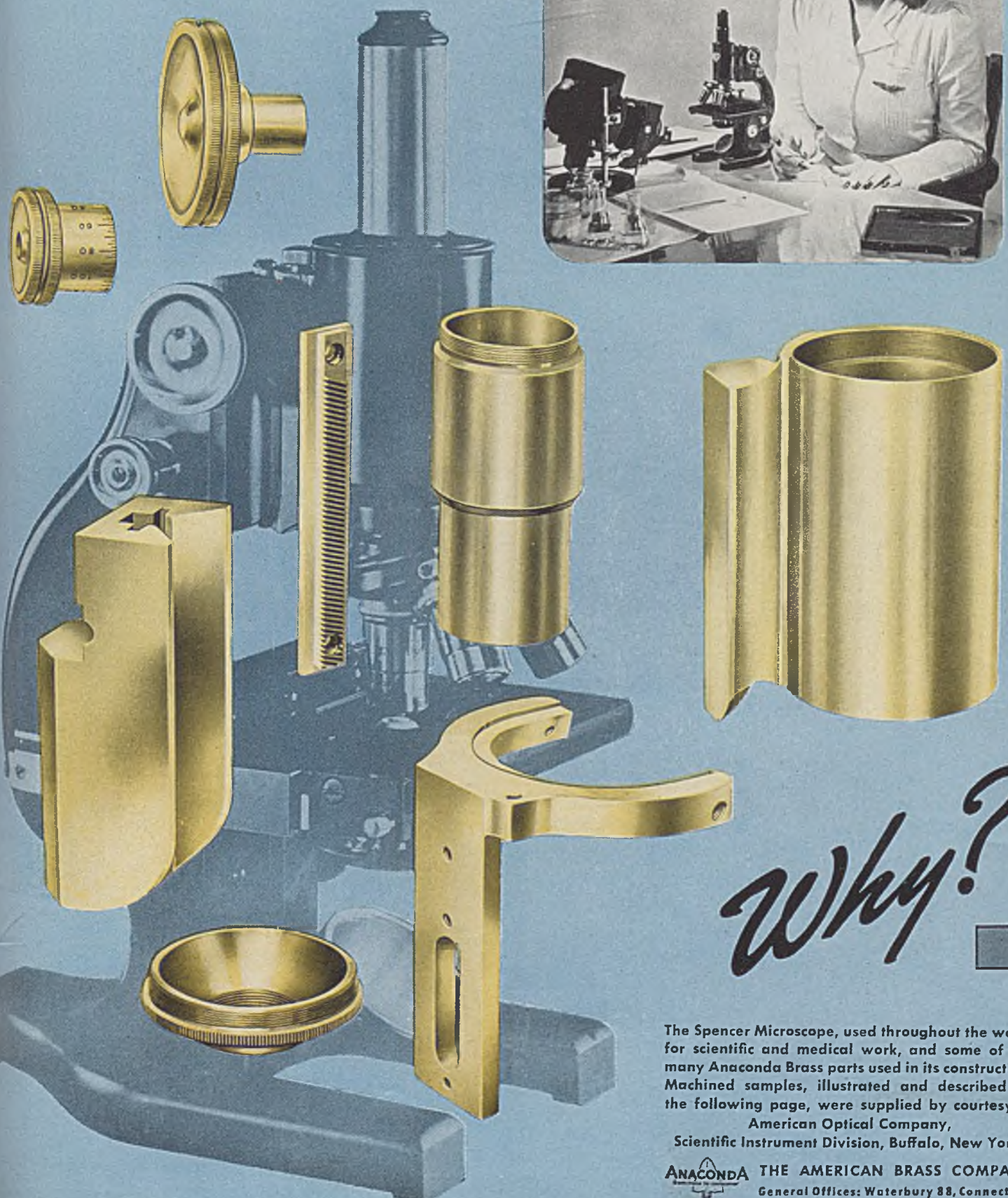
TITUSVILLE FORGE, division of Struthers Wells Corporation has, for more than fifty years, been an outstanding source for quality forgings. With unexcelled production facilities, broad technical and metallurgical experience in every field where forgings are used—TITUSVILLE FORGE is your logical headquarters for the best in heavy steel and alloy forgings, line shafts, die blocks, leveling rolls and other similar forgings—that require advanced engineering and master craftsmanship.



STRUTHERS WELLS CORPORATION
Titusville Forge Division, Titusville, Pa.

Plants at Titusville, Pa. and Warren, Pa. Offices in Principal Cities

Where **PRECISION** is the goal
BRASS is the metal...



Why? →

The Spencer Microscope, used throughout the world for scientific and medical work, and some of the many Anaconda Brass parts used in its construction. Machined samples, illustrated and described on the following page, were supplied by courtesy of American Optical Company, Scientific Instrument Division, Buffalo, New York.

ANACONDA THE AMERICAN BRASS COMPANY
General Offices: Waterbury 88, Connecticut

Here's why

Nothing serves like **BRASS**

IN THE CONSTRUCTION OF SCIENTIFIC INSTRUMENTS

MODERN MICROSCOPES, and similar optical instruments, have one important attribute in common—accuracy in the lens system . . . often held to a *millionth of an inch!* And for the necessary rigidity of the instrument, positive operation, smoothness and precision of adjustment—nothing short of mechanical perfection will do.

That is why, for the critical mechanical parts illustrated below and on the preceding page, nothing serves as well as Brass. For Brass is a sturdy metal . . . it is strong, tough, durable, corrosion resistant, and does not rust. It machines readily—leaves clean, full-formed threads and knurls . . . provides exceptionally smooth milled, reamed or turned surfaces for bearing or mating parts.

Brass is economical, too. Through The American Brass Company it is produced in a wide range of readily-adaptable alloys in commercial forms; also in special extruded and drawn shapes, hot pressed parts and pressure die castings. We'll be glad to cooperate in determining the form and alloy most suitable for your needs.



THE AMERICAN BRASS COMPANY

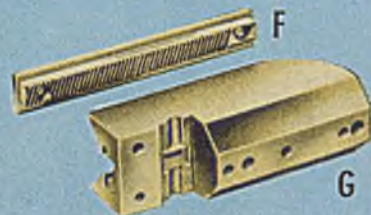
Subsidiary of Anaconda Copper Mining Company

General Offices: Waterbury 88, Connecticut

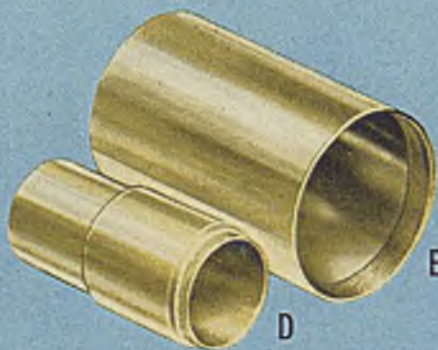
In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ont.

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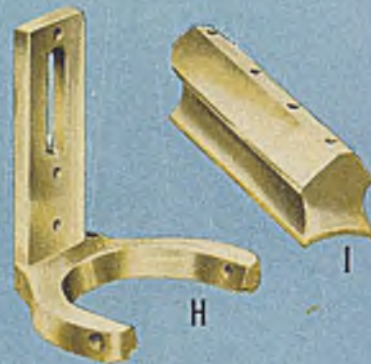
(A) Graduated fine adjustment button, (B) coarse adjustment button, (C) body tube nose adapter. All three are machined from Anaconda Free Cutting Brass Rod—an excellent base, incidentally, for their lasting chromium plate.



Anaconda Brass bar stock was used for this coarse adjustment rack (F), and the intricately form-milled intermediate slide block (G).



(D) Fixed eyepiece tube and (E) body tube are made of Anaconda Seamless Brass Tubes and machined with fine-pitch threads.



This unusual shaped fork-type substage mounting (H) is economically produced as an Anaconda Pressure Die Casting. And by using an Anaconda Hot Pressed Forging for this body slide member (I), which is silver soldered to the body tube, both metal and machining time are saved.

Cross-section of the optical system of a Spencer Polarizing Microscope, a product of American Optical Company, Scientific Instrument Division, Buffalo, New York. This instrument is used widely in many branches of science and industry for studying the structure of materials—fibrous, granular, crystalline, powdered or colloidal.

Anaconda Copper & Brass

MARKET SUMMARY

Load on Steel Mills Heavy Despite Increased Output

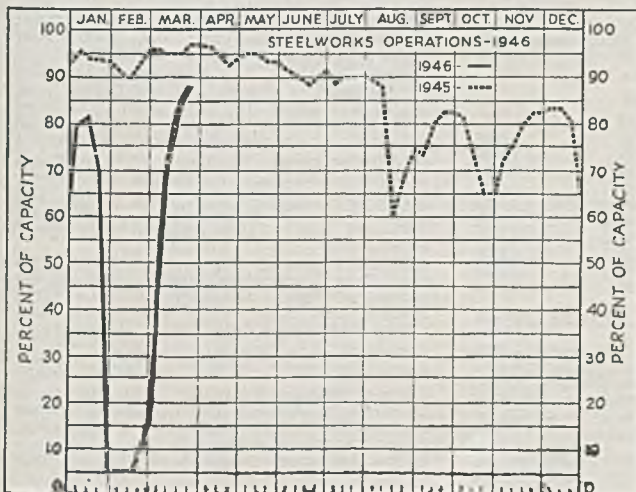
Tonnage carried over from first quarter heaviest known . . . Pig iron, scrap shortage threat to future operations

WHILE steel production is at a high rate, better than during months immediately preceding the steel strike, the quarterly carryover of tonnage scheduled to have been delivered in first quarter will be the heaviest on record, as a result of strike interruptions.

Meanwhile new demand is increasing, with the situation in light flat products tighter than at any time and with promises on all major products extended far into the future. Threat of a soft coal strike in April promises to complicate conditions further. Demand for sheets continues overwhelming. Consumers shop among mills with little success, as some producers are out of the market for the year on virtually all grades and are side-stepping business for 1947. Others are on a quarterly quota basis which means practically the same thing. The latter have not formally opened books for third and fourth quarters but apparently there is little chance, short of special directives, for those not already protected, to get on schedules.

So critical has the pig iron situation become that producers, in effect, are no longer taking orders but are telling customers what they will give them, which in practically, if not all cases, is far less than what is asked. Producers are rationing tonnage more closely than at any time since the war. In some cases tonnage is being rationed on the basis of 1945 shipments and in others on the basis of 1944-45 shipments. Pig iron consumers have relaxed specifications long since, taking almost anything within reason offered by furnaces. Off-grade iron produced while blast furnaces were getting back into operation after the strike has been taken quickly in many cases.

Confusion following the recent announcement of price increases on steel products is being cleared by further announcements by OPA. Rail extras, as well as the base price, are on a



DISTRICT STEEL RATES

(Percentage of Ingot Capacity Engaged in Leading Districts)

	Week Ended		Same Week	
	Mar. 23	Change	1945	1944
Pittsburgh	96.5	+ 4	91.5	93
Chicago	88	+ 2.5	101.5	100.5
Eastern Pa.	83	+ 6	95	94
Youngstown	88	+ 3	93	96
Wheeling	90.5	+ 4.5	98.5	98
Cleveland	96.5	+ 3.5	91.5	92.5
Buffalo	83.5	+ 8.5	90.5	90.5
Birmingham	95	None	95	95
New England	91	+ 3	88	90
Cincinnati	76	None	76	88
St. Louis	54	-13.5	80	77
Detroit	90	None	91	89
Estimated national rate	88.5	+ 4	97	98.5

*Based on steelmaking capacities as of these dates.

net ton instead of gross ton basis, a point recently cleared up. While most sellers of stainless sheets have increased prices 8.2 per cent, at least two large producers have not yet taken action. On alloy prices in general, questions remain to be clarified, although one doubtful point has been cleared up. High-tensile low-alloys, it is now declared, will take the same advance as carbon steels. Originally the question was whether they would take the carbon increase or the 4 per cent advance applying to most alloys.

Estimated national rate of steelmaking has risen further, up 4 points to 88½ per cent of capacity, which is higher than at any time since August. Not much margin is left for further increase in some districts. Pittsburgh rose 4 points to 96½ per cent, Cleveland 3½ points to 96½, Wheeling 4½ points to 90½, eastern Pennsylvania 6 points to 83, Youngstown 3 points to 88, Chicago 2½ points to 88, Buffalo 8½ points to 83½ and New England 3 points to 91. Rates were unchanged at Cincinnati 76, Birmingham 95 and Detroit 90. St. Louis receded 13½ points to 54 per cent. Pacific Coast operations were at 79 per cent up ½-point.

Scrap shortage has assumed a serious aspect and Civilian Production Administration has issued a call for householders and farmers to search out any scrap material that can be found, in an effort to make up the deficit of about two million tons in scrap reserve. This reserve is said to have shrunk from an estimated 5,600,000 tons at the middle of 1943, when the former country-wide drive closed, to about 3,000,000 tons at the end of the war.

Tin plate producers are preparing new lists on the basis of the recent increase of 25 cents per base box, although in practice the higher price of \$5.25 will apply only to specialty items on shipments for the remainder of 1946 as tin plate producers are under yearly contracts with can manufacturers on a fixed price basis, the latter being committed similarly to food packers. The specialty items, such as tin mill black plate for other than can manufacture, involve only a small percentage of shipments.

Office of Price Administration has authorized an increase of 75 cents per ton on all grades of pig iron except charcoal, the third increase since it assumed charge of prices in 1941. The previous increases were 75 cents and \$1.

COMPARISON OF PRICES

	Mar. 23	Mar. 16	Mar 9	One Month Ago Feb. 1946	Three Months Ago Dec. 1945	One Year Ago Mar. 1945	Five Years Ago Mar. 1941
Finished Steel	\$63.54	\$63.54 ^a	\$63.54 ^a	\$60.91	\$58.27	\$57.55	\$56.73
Semifinished Steel	40.60	40.60	40.60	39.20	37.80	36.00	36.00
Steelmaking Pig Iron	25.50	25.50	24.75	24.75	24.25	24.05	23.05
Steelmaking Scrap	19.17	19.17	19.17	19.17	19.17	19.17	20.15

^aRevised

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, cents per lb.; coke, dollars per net ton; others dollars per gross ton.

Finished Material					Pig Iron				
	Mar. 23, 1946	Feb., 1946	Dec., 1945	Mar., 1945		Mar. 23, 1946	Feb., 1946	Dec., 1945	Mar., 1945
Steel bars, Pittsburgh	2.50c	2.375c	2.25c	2.15c	Bessemer, del. Pittsburgh	\$27.69	\$26.94	\$26.94	\$26.19
Steel bars, Philadelphia	2.82	2.695	2.57	2.47	Basic, Valley	26.00	25.25	25.25	24.50
Steel bars, Chicago	2.50	2.375	2.25	2.15	Basic, eastern del. Philadelphia	27.84	27.09	27.09	26.34
Shapes, Pittsburgh	2.35	2.275	2.10	2.10	No. 2 fdry., del. Pgh. N. & S. sides	27.19	26.44	26.44	25.69
Shapes, Philadelphia	2.465	2.340	2.215	2.215	No. 2 foundry, Chicago	26.50	25.75	25.75	25.00
Shapes, Chicago	2.35	2.225	2.10	2.10	Southern No. 2, Birmingham	22.88	22.13	22.13	21.38
Plates, Pittsburgh	2.50	2.375	2.25	2.20	Southern No. 2, del. Cincinnati	26.80	26.05	26.05	25.36
Plates, Philadelphia	2.55	2.425	2.30	2.25	No. 2 fdry., del. Philadelphia	28.34	27.59	27.59	26.34
Plates, Chicago	2.50	2.375	2.25	2.20	Malleable, Valley	26.50	25.75	25.75	25.00
Sheets, hot-rolled, Pittsburgh	2.425	2.3125	2.20	2.20	Malleable, Chicago	26.50	25.75	25.75	25.00
Sheets, cold-rolled, Pittsburgh	3.275	3.165	3.05	3.05	Lake Sup., charcoal del. Chicago	37.34	37.34	37.34	37.34
Sheets, No. 24 galv., Pittsburgh	4.05	3.875	3.70	3.65	Gray forge, del. Pittsburgh	26.69	25.94	25.94	25.19
Sheets, hot-rolled, Gary	2.425	2.3125	2.20	2.20	Ferromanganese, del. Pittsburgh	140.00	140.00	140.00	140.33
Sheets, cold-rolled, Gary	3.275	3.165	3.05	3.05	Scrap				
Sheets, No. 24 galv., Gary	4.05	3.875	3.70	3.65	Heavy melting steel, No. 1, Pittsburgh	\$20.00	\$20.00	\$20.00	\$20.00
Hot-rolled strip, over 6 to 12-in., Pitts.	2.35	2.225	2.10	2.10	Heavy melt. steel, No. 2, E. Pa.	18.75	18.75	18.75	18.75
Cold-rolled strip, Pittsburgh	3.05	2.925	2.80	2.80	Heavy melting steel, Chicago	18.75	18.75	18.75	18.75
Bright bess., basic wire, Pittsburgh	3.05	2.90	2.75	2.60	Gray forge, del. Pittsburgh	22.25	22.25	22.25	22.25
Wire nails, Pittsburgh	3.25	3.075	2.90	2.80	Rails for rolling, Chicago	20.00	20.00	20.00	20.00
Tin plate, per base box, Pittsburgh	\$5.25	\$5.125	\$5.00	\$5.00	No. 1 cast, Chicago	20.00	20.00	20.00	20.00
Semifinished Material					Coke				
Sheet bars, Pittsburgh, Chicago	\$38.00	\$37.00	\$36.00	\$34.00	CConnellsville, furnace ovens	\$7.50	\$7.50	\$7.50	\$7.00
Slabs, Pittsburgh, Chicago	39.00	37.50	36.00	34.00	CConnellsville, foundry ovens	8.25	8.25	8.25	7.75
Re-rolling billets, Pittsburgh	39.00	37.50	36.00	34.00	Chicago, by-product fdry., del.	13.35	13.75	13.75	13.35
Wire rods, No. 5 to 7/8-inch, Pitts.	2.30c	2.225c	2.15c	2.00c					

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; beehive oven 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: F.o.b. mill base, re-rolling qual., stand. analysis, \$33.

Alloy Steel Ingots: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon; uncorp, \$46.80.

Re-rolling, Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, \$39; Detroit, del., \$41; Duluth (bil), \$41; Pac. ports (bil), \$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; forg. bil. f.o.b. Pac. ports, \$59.

(Andrews Steel Co. may quote carbon forging billets \$50 gross ton at established basing points; Follansbee Steel Corp., \$49.50 f.o.b. Toronto, O. Geneva Steel Co. \$64.64, Pacific ports.)

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, \$56.16, del. Detroit \$58.16, eastern Mich. \$59.16.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, \$38. (Empire Sheet & Tin Plate Co., Mansfield, O., carbon sheet bars, \$39, f.o.b. mIll.)

Skelp: Pittsburgh, Chicago, Sparrows Point, Youngstown, Coatesville, lb., 2.05c.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, No. 5—5/8 in. inclusive, per 100 lbs., \$2.30. Do., over 5/8—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: 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; 2.87c; Pac. ports, dock, 3.15c. (Calumet Steel Division, Borg-Warner Corp., and Joslyn Mfg. & Supply Co., may quote 2.55c, Chicago base; Sheffield Steel Corp., 2.75c, f.o.b. St. Louis.)

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, 2.81c; Detroit, del., 2.91c. (Texas Steel Co. may use Chicago base price as maximum f.o.b. Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

AISI Series	(*Basic O-H)	AISI Series	(*Basic O-H)
1300	\$0.104	4300	1.768
2300	1.768	4600	1.248
2500	2.632	4800	2.236
3000	0.52	5100	0.364
3100	0.884	5130 or 5152	0.468
3200	1.404	6120 or 6152	0.988
3400	3.328	6145 or 6150	1.248
4000	0.468	8612	0.676
4100 (15-25 Mo)	0.728	8720	0.728
(20-30 Mo)	0.78	9830	1.352

* 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, 3.48c; Detroit, del., 3.58c; eastern Mich., 3.63c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Spar-

rows 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, 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., 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 Detroit and 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., 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., 4.13c; 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.

Sheets, Strip . . .

Sheet & Strip Prices, Page 156

Pressure for sheets and strip is as high as at any time during the war and inquiry is active in spite of difficulty of consumers to get back into production after the labor upset. Some backlog may be due to duplicate orders but other tonnage is sufficient to load mills heavily. Most producers are sold through the year on most grades of sheets and are taking little or no tonnage for 1947 delivery.

Boston — Rescheduling by narrow cold-rolled strip mills is progressing slowly, keyed to revised deliveries by hot mills and alloys are more extended. Fabricators of both sheets and strip are frequently hampered by unbalanced inventories and are shopping for fill-in tonnage with limited success. Although much flat-rolled tonnage on books remains to be definitely scheduled, backlogs are usually sufficient eventually to fill capacity during the balance of this year.

Polished stainless and electrical sheets are especially extended, with demand tending upward. Reduction in second quarter allotments, which may be continued well beyond that period, is forcing some consumers to revise programs.

Surplus sales are sharply stimulated by the delivery situation and sheets notably are being rationed from larger offerings, most buyers not getting more than 60 tons and some less, including L. E. Zurbach Steel Co., Somerville, Mass.; Rafferty-Brown Steel Co. Inc., Worcester; Merrill & Usher Co., Worcester; American Steel & Alloys Corp., West Hartford; Dolan Steel Co., Bridgeport; Eastern Steel & Metals Co., New Haven; Arthur C. Harvey Co., Boston; Park City Supply Co., Bridgeport; T. J. Rafferty Co. Inc., Worcester; Seaboard Steel Co., New Haven; Consolidated Maintenance Co., Springdale, Conn. The above allotments were through the New York office of War Assets Corp. At Boston, North & Judd Mfg. Co., New Britain, Conn., obtained 487 tons of rolled steel from surplus.

New York — Pressure for sheets of practically all descriptions is as high as at any time since the war. Despite labor troubles at some consuming plants and difficulty of others in getting back into full production following adjustments of their labor disputes, inquiry is highly active. Many consumers have programs in prospect requiring far more steel than in prewar times.

It is admitted, however, that the volume of present demand may be due in part to repetitious inquiries, resulting from efforts of consumers to obtain space on mill books.

Many sellers are sold out for the remainder of the year on hot and cold-rolled and galvanized sheets and on certain specialties, such as electrical sheets. Where others are not formally booked up for the remainder of the year, it is usually because they are on a quota basis and the situation to all practical purposes is just about as tight. Sellers booked solidly over the remainder of the year are not accepting new business, except in some few cases. Certain exceptions are in the case of stainless, with sellers booked into March and beyond. One seller of stainless is quoting

both polished and unpolished grades for March shipment, while some still have tonnage available for the latter part of this year.

Cincinnati — One district sheet mill has completed its second quarter schedule but has done nothing tangible toward third quarter commitments. Mills are pressed to find an equitable basis for distribution of available tonnage. A review of developments during wartime years, particularly those affecting equipment, discloses that district production of cold-rolled has been cut, and galvanized expanded. The pinch in pig iron supply may slow return of one steelmaker to full production as soon as planned.

St. Louis — All sheet and strip production largely ceased here last week with shutdown of the Granite City Steel Co. by a strike of an independent machinists' union, which established a picket line CIO steel workers declined to cross. The mill had been in production only five days following settlement of the steel strike. Furnaces have been cut off, with the prospect production cannot be resumed under a week after settlement. Shipments of steel and incoming raw materials, and work on a new cold sheet mill projected for completion in mid-summer, have stopped. Rolling schedules are filled through 1946 and books have not yet been opened for 1947.

Cleveland — Steel producers have withdrawn from the market on all principal products, including sheets and strip, until their order books can be restored to a more satisfactory position. However, June and July delivery can be promised in some instances on alloy products, plates and some specialties, including floor plates and wire rope. Production has made a substantial recovery from effects of the steel strike and operations are described as being satisfactory. Many leading interests in the industry look for further price adjustments to restore the normal relation between selling prices and production costs. Sales offices of producers are still awaiting a clarification or revision in the OPA price action on alloy products.

Birmingham — Sheet orders are being taken in as limited quantity as possible with the quota system generally in operation. Pressure is felt on all sides for deliveries which are next to impossible. As was expected, agricultural users are pressing for sheets, especially roofing, but jobbers are getting only a fraction of their requirements.

Pittsburgh — Production is back to prestrike rate and on basis of present order backlogs operations will be sustained near capacity through remainder of this year. Sellers will not be able to make up the two months carryover tonnage resulting from the steel strike, and threatened coal strike April 1 would push delivery promises back still further. Some producers are not accepting more orders on narrow strip, galvanized and electrical sheets, and polished stainless sheets, for backlogs already are extended through 1946.

Mills are doing everything possible to increase sheet and strip output to meet requirements from civilian goods industries. The problem of satisfying needs of regular customers is accentuated by resumption of operations of such

large sheet and strip consumers as General Motors Corp. and General Electric Corp., while many metalworking companies have resumed operations in recent weeks.

In an effort to speed up production some producers are no longer booking new orders for less than 5 tons per item, and are urging customers with orders on mill books for less than this tonnage per item to obtain material from warehouses. However, in this latter instance producers will continue to process the small orders if the customer is unable to switch to a warehouse source or for some other reason desires to leave the order on mill books. One large interest estimated that about 45 per cent of its sheet and strip orders involved items less than 5 tons, and added that considerable time under the continuous mill operations is lost daily in unwinding coils and shearing finished product to meet small tonnage specifications.

Recent OPA clarification of amendment 15 to RPS-6, definitely established the \$7 a ton increase on galvanized sheets as also applicable on culvert sheets. Other interpretations of the amendment follow: The increase for roofing and siding is to be determined by reference to the flat-rolled products from which it is made. Thus, the base price for galvanized roofing and siding was increased 35 cents per 100 pounds, while roofing and siding made from hot-rolled sheets was advanced 22.5 cents. Some confusion still exists on ridge rolls. Dividing line between cold-rolled strip and cold-rolled spring steel is different for various producers so the increase of 25 cents or 8.2 per cent is dependent on the mills' previous selling policy.

Chicago — Steel sheets are once more flowing from mills in prestrike volume, but individual consumers are not getting sufficient tonnage, or type and size assortment to lift fabricating operations near normal rates. At least another month will be required for inventories to rise to the level which will sustain reasonable production. Sheetmakers to be equitable to their customers are fanning out shipments widely and limiting quantities. Meanwhile, pressure for deliveries and placing new business is heavy.

Baltimore — Civilian Production Administration has issued a special directive for 6000 tons of cold-rolled sheets for delivery in April and May for fabrication of tobacco flues. Approximately 90 per cent will be 24-gage, with the remainder 20-gage. Cold sheets instead of the ordinary hot black plate are being used to take advantage of strip mill capacity. Several mills will participate in the business.

Steel Bars . . .

Bar Prices, Page 156

Small sizes of hot-rolled carbon bars are sold through the year in most instances, with cold-drawn available earlier and hot-rolled alloys as early as May by some producers. This spread is causing some consumers to change from usual specifications more easily available, in spite of the premium price.

New York — While at least one seller has some third quarter tonnage available, most producers of hot carbon bars are booked well into fourth quarter on

practically all sizes and in a few instances are booked throughout the year. Cold drawers have tonnage available for third quarter, but deliveries are stiffening rapidly, especially inasmuch as various buyers who normally specify hot carbon have been switching to cold-drawn in an effort to take advantage of the earlier deliveries which have and which still do prevail to some extent, as compared with hot carbon bars. Hot-rolled alloy bars are being quoted generally for May shipment, and so attractive are these deliveries that in some instances even alloy is being substituted for carbon, buyers willing to pay the premium in order to obtain reasonably nearby shipment.

Boston — Steel bar deliveries range from May to December and beyond, depending on size, grade and finish. Hot-rolled alloys are available first, but beyond May deliveries extend sharply on cold-drawn, turned and polished. Some grades and finishes of cold-drawn carbon bars are not too far off, but are becoming more so as hot-rolled tightens. On more small sizes mills are sold out on hot carbon bars for the balance of the year. This spread in deliveries makes for scattered revisions in specifications but these are still limited because of the general tightness in small sizes in practically all grades. Hot-rolled alloys and some sizes in cold-rolled are competitive, however. Forge shop consumption is picking up slightly with shops having automotive orders.

St. Louis — Merchant bar demand continues strong. Production is somewhat larger but mills have little hope of gaining on orders. For the first time since Pearl Harbor mills are reported fully and adequately manned. Maximum production is predicted by May or June. All bar sizes are sold to the end of the year with first quarter schedules next year about half filled. Most bar mills are changing from two overtime shifts to straight three-shift basis.

Pittsburgh — Bar mill output last week compared favorably with prestrike volume and, except for possible interruption by a coal strike, mills are expected to be under forced draft through remainder of this year to meet pent-up requirements for nearly all bar specifications. Most sellers are out of the market for this year on carbon bars in small and medium sizes, with larger sizes available late third quarter, and alloys scheduled for May and June. With carbon bar output back to practical capacity, cold drawers are making more definite delivery commitments which generally fall into August on larger sizes and up through December on smaller specifications.

Alloy bar prices are subject to still further revision, trade officials state. Amendment 15 to RPS-6 states maximum base price plus extras on all alloy steel products except stainless are advanced 4 per cent. However, in arriving at this percentage OPA took into consideration stainless and tool steels, and therefore on the basis of excluding these items the percentage increase on alloys would be between 6 and 7 per cent. Official OPA revision, likely to take the form of an across-the-board advance of \$5 a ton, is expected momentarily. In a recent OPA statement clarifying Amendment 15 to RPS-6, it was

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pointed out that the increase granted for die-rolled sections is to be determined by the producers' customary practice. If priced on a hot-rolled bar basis they take the same increase of 25 cents per 100 pounds; if priced as a semifinished product base, they take advance applicable to such products.

Steel Plates . . .

Plate Prices, Page 157

Plate demand is not as strong as for some other finished steel items but considerable tonnage is in the offing for Maritime Commission vessels, on which bids are to be taken soon. Tank makers continue to seek tonnage as demand

for their products is heavy. Most producers have little to offer until late in the year.

Philadelphia — Bids on five ships for the Maritime Commission, requiring 69,000 tons of steel, have been postponed until next month. Bids on three ships, which are to be passenger and cargo ships and which will require 13,000 tons each, have been set back from March 18 to April 15 and those on the two others, which are of the passenger type requiring an estimated 15,000 tons each, from March 28 to April 25.

Meanwhile action is still pending on award by the Maritime Commission of four ore ships recently noted as requiring a total of 24,000 tons, with Sun

Shipbuilding & Dry Dock Co., Chester, Pa., low. Bethlehem Steel Co., by whom the ships are to be operated, is reported to have promised better delivery through its shipbuilding division, although it is second lowest bidder.

Overall plate demand has been somewhat less active recently although business is still good and producers generally are booked well into the future. Some have little to offer before late in the year, one having nothing for this year. On the other hand, one large interest can make August shipments.

Boston — Mild bulge in plate requirements for water storage includes over 500 tons for elevated tanks and standpipes at Dennis, Yarmouth and Sagamore, Mass., to be fabricated and erected by Pittsburgh-Des Moines Steel Co. A 500,000-cubic foot holder is also planned by Springfield, Mass., Gas Light Co., one of the first postwar projects in this category. Demand for plates is active, notably in light gages. Not all mill space sold during the recent stoppage has been definitely scheduled, although most of this tonnage as well as current bookings will fall in fourth quarter. Indicative of lack of plates with some fabricators are heavier purchases of contract-terminated surplus. Most recent compilation includes sale of 1630 tons; Bath Iron Works, Bath, Me., bought 405 tons.

Seattle — Plate shops are working on a large number of jobs under 100 tons each, but labor troubles and lack of material are handicaps. Considerable material has been purchased from shipyard surpluses but light plates are difficult to obtain, though heavier gages are available from shipyards. Prospects are good, as several major products are coming out. Tacoma, Wash., has a water project requiring 3000 to 4000 tons of plates for 30 to 54-inch mains, replacing wood, on which bids will be taken soon. Hydraulic Supply Mfg. Co., Seattle, is building seven steel barges for Alaskan fish packing companies, requiring 250 tons of plates. Chicago Bridge & Iron Co. has a \$50,000 contract for a steel water tank and tower for Ontario, Oreg.

Birmingham — Plate demand has increased sufficiently to delay deliveries further. Several large users are hard pressed and have work scheduled that they will make no guess on as to delivery. Mills are adhering as closely as possible to the self-imposed allocation system, and users generally are not getting as much tonnage as asked. Backlogs continue to grow.

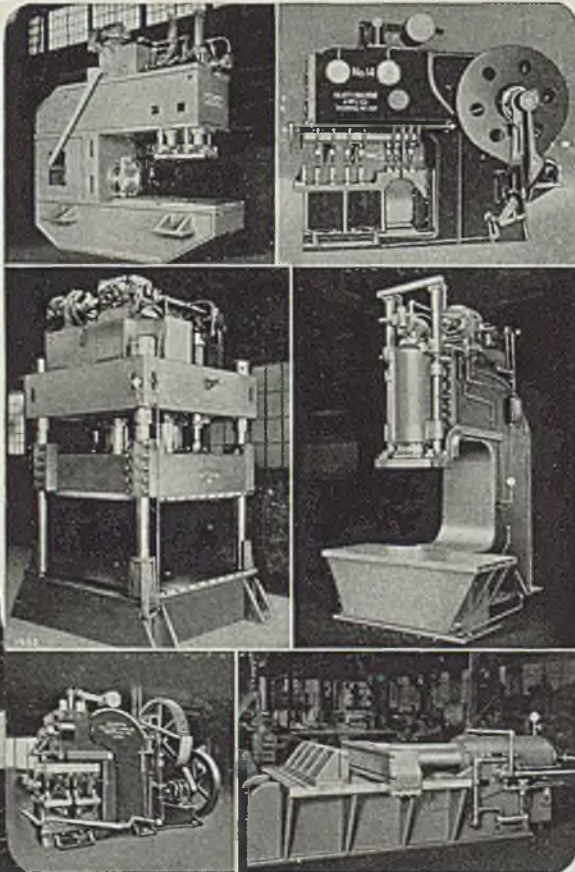
Tubular Goods . . .

Tubular Goods Prices Page 157

Seattle—Cast iron pipe is in strong demand, several large projects being up for figures last week. Contracts are being taken on the basis of deliveries as soon as possible, shipments being slow and local stocks low. A number of major projects are ready to become active when pipe can be obtained. Yakima, Wash., has awarded 540 tons of cast pipe to H. G. Purcell, Seattle, with a separate contract for fittings. The same seller has booked 322 tons of 6, 8 and 12-inch pipe for Bremerton, Wash. Tacoma, Wash., has placed general contracts for two local improvements, requiring over 200 tons of cast pipe. Award of 600 tons of cast pipe for the Maplewood



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district, Portland, Oreg., is pending, following opening of general contract bids.

Wire . . .

Wire Prices, Page 157

Boston — Drawn wire is being spread thin among consumers with rescheduling and quota reductions directed toward supplying those most in need. Resumption of full production has lagged with some producers, with limited supply of rods a factor. Small tonnages of rods, excess with a Buffalo integrated producer, whose New England mills have been down, are available temporarily, but will be needed in normal output when these units get back into production. On many finished wire products, mills are sold through this year with deliveries based on revised district quotas; pressure for tonnage is strong. New inquiries are screened to fit into schedules, although there are scattered openings for music wire in third quarter. Suppliers of parts requiring wire to the automobile industry built up substantial banks in recent weeks. Shipments of these are heavier, but as most of these fabricators have been consuming wire, there is slight easing on mills for replacement material. Except for fringe cases requiring interpretation, involving some extra revisions, price confusion has clarified. Warren Telechron Co., Ashland, Mass., took 275 tons magnet wire from surplus.

New York — While high carbon wire is relatively tighter and more extended than low carbon, most mills are sold well into fourth quarter with few exceptions. Rod allocations and inquiries are drastically screened and sometimes reduced 40 per cent. Notably tight is bed spring material and tire bead wire. No second quarter quota for wire nails is announced by one large producer seeking to catch up; there are some cancellations and drastic rescheduling. The proposed housing program over the next two years is estimated to require 12 million kegs of nails.

Birmingham — The farm trade is bringing increasing pressure to bear for wire products, notably wire fencing and nails. Scarcities are evident over the entire territory, even in the case of railroads, which need nails in large quantities. Wire deliveries are weeks to months off and then on a quota basis.

Tin Plate . . .

Tin Plate Prices, Page 157

Pittsburgh—Tin plate producers are preparing new price lists on basis of the recent 25 cents per base box increase granted by OPA on hot-dipped, electrolytic tin plate and canmaking quality black plate. However, in practice these higher prices will apply only for specialty items on shipments through rest of this year for tin plate producers are under yearly contracts with can manufacturers on a fixed price, while can manufacturers similarly are committed on cost of containers to packers. These specialty items, such as tin mill black plate for other than canmaking, involve only a small percentage of shipments. Contracts for 1947 tin plate shipments are expected to be established on the \$5.25 per base box basis for hot-dipped and \$4.90 for 0.75-pound electrolytic.

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and is expected to be under forced draft through third quarter to meet huge requirements for perishable food containers. Heavy world-wide demand for tin plate is expected for some time. Strike cut sharply into production this quarter leaving much tonnage to be made up over remainder of this year. Sellers are scheduled through third quarter and for all practical purposes are booked throughout 1946 under contract arrangement with can manufacturers. Indicative of continued heavy demand prospects for tin plate is recent announcement by Weirton Steel Co. that company's output in 1946 will be increased 50 per cent. Additional cold-rolling mills are being installed in the strip steel department to increase output of tin plate.

Installation of a cold-reduction mill at Jones & Laughlin Steel Corp.'s Aliquippa, Pa., works is expected to permit substantial increase in tin plate output at that plant; and the Irvin Works of Carnegie-Illinois Steel Corp. is increasing capacity for cold reduction of tin plate, and adding equipment for hot dipping operations.

Cleveland—All leading tin plate producers are withholding action on tin plate prices, although the Office of Price Administration has advanced ceiling prices 25 cents per base box. Any new business being booked for 1946 delivery is being done on an unchanged price basis with the understanding that there may be a subsequent upward revision in line with OPA's latest authorization.

Producers are still required to reserve 85 per cent of their output for the perishable food and certain other essential industries, for orders identified by the symbol "CXS" (Certified Export Steel). Export of a substantial portion of the tonnage originally scheduled for first half delivery will be pushed back until late in third quarter.

Structural Shapes . . .

Structural Shape Prices, Page 157

New York—A heavy volume of structural work is accumulating, fabricators are not in position to meet the demand. Not only is there continued lack of draftsmen, but also a shortage of steel. Consequently fabricators are selecting tonnage carefully for figuring. As a matter of fact, one large district fabricator is still strikebound, and also one shape producer in eastern Pennsylvania.

An outstanding order here involves 1000 tons for a hospital building in East 68th St., awarded the American Bridge Co., which also closed on 480 tons for a building for the Second Avenue Bus Line. Inquiry includes 1200 tons for a plant at Utica, N.Y., for the Continental Can Co.

Boston—Except for three small spans in Maine and Vermont, the latter at Newport. bridge inquiry is absent; high unit costs are postponing this type of public work based on program estimates. If unit costs exceed 35 per cent of 1941, and they currently do, there is slight chance of the Massachusetts program going ahead. New inquiry for fabricated material is slower, but includes scattered industrial extensions, a hoisery mill at Florence, Mass., and a woolen mill at West Swansea, N. H., the latter placed with Phoenix Bridge Co. Demand for plain material has not eased, with deliveries in fourth quarter; on some small sizes mills are taking no more firm orders for delivery this year.

St. Louis—Inquires for steel for residential construction are appearing and one mill has scheduled for June delivery 800 tons of steel joists and a large quantity of pipe for 350 homes to sell at \$6-000. Inquires for scarce metal lumber are increasing. This is the first order in quantity here for residential steel since before the war.

Philadelphia — Structural awards are light but inquiries continue to mount. Fabricators are figuring only on more attractive jobs and those likely to go ahead. At least two district fabricators are down, one because of lack of steel and the other because of a strike which has been in effect since Jan. 21. One district shape mill also continues strikebound.

Pig Iron . . .

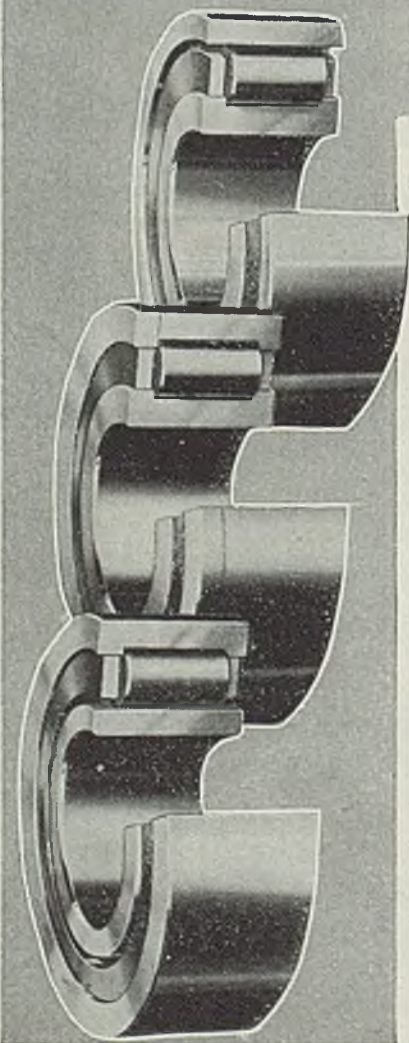
Pig Iron Prices, Page 159

Recent advance of 75 cents per ton on all grades of pig iron except charcoal, effective March 15, is considered inadequate by furnace interests as costs have risen much more than this will balance. Shortage continues and sellers are rationing tonnage in proportion to past buying by melters. Easier labor situation in foundries is increasing demand for additional tonnage.

Pittsburgh — Recent increase in pig iron prices, 75 cents per ton on all grades except charcoal, is not sufficient

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idle high cost units now idle, to help relieve present shortage. Some of these units will have to be granted premium prices before operations can be resumed, and in addition coke and ore supply sources must be established. Melters state that should the threatened coal strike result in higher coal and coke prices, additional advance in pig iron would be sought, particularly since latest increase was less than blast furnace interests held necessary to compensate them for higher labor and other rising costs.

Pig iron output here currently is above prestrike level with 47 out of 54 furnaces pouring iron. Merchant sellers are swamped with inquiries from other than regular customers, nearly all of which are rejected as output is being rationed on basis of immediate needs of long standing customers. Steady upturn in overall pig iron requirements is anticipated through remainder of this year at least. Prospective price advances for gray iron and malleable castings have not yet been officially announced. Recent OPA approval of a 4 per cent advance in steel casting prices, effective March 12, is held inadequate by the trade.

New York — All grades of pig iron, except charcoal, are now moving at 75 cents a ton higher, effective March 15. This increase, granted by OPA, falls substantially short of what producers claim they need in meeting the further increase in labor costs and advances in certain other operating charges.

Production continues to expand, but has not yet reached prestrike level. Likewise, melt is improving, although a few important units are still strikebound, including the American Radiator plant in Bayonne, N. J. Virtually all active foundries are badly in need of iron, with labor supply now permitting higher operations and with cast scrap supply as short as it has been at any time in months. All foundries appear to have heavy order books.

Buffalo — Easier conditions in foundries are reflected in calls for additional tonnage of pig iron. Suppliers also are faced by enlarged requirements when regular customers have settled strikes and return to production, these not now receiving iron. Production here has increased to 81 per cent of capacity as Bethlehem Steel Co. blew in its fifth stack out of seven, all five being on basic.

St. Louis — Pig iron continues tight with inventories low. Order backlogs are relatively small, due to allocations. Pig iron production in this area is at 50 per cent of capacity. One of the two furnaces, government owned, being idle, pending disposal. Labor is adequate and output is steady.

Cleveland — Production of pig iron has increased steadily since the end of the steel strike and is now close to prestrike level. Producers are unable to satisfy all demand and expect to maintain quotas indefinitely. Although no curtailment of steel ingot production is attributable to a lack of iron, some foundries have been unable to maintain production at desired levels, due to delays in receipts of pig iron. One foundry supplied from this district, for instance, is operating on only a 24-hour supply which precludes any increase in his present rate. Any delay in deliveries is immediately reflected in his op-

erations. Several other foundries are operating on a four to five-day supply and practically all have less than a 30-day inventory, the present limit.

The price increase of 75 cents a gross ton in ceiling prices for pig iron, effective as of March 15, makes the base prices here \$26.50 for foundry and malleable, \$26 for basic, and \$27 for bessemer. Producers state that this increase is not sufficient to cover the cumulative advances in production costs.

Cincinnati — Contracting for second quarter pig iron supplies is near completion, with furnaces holding commitments near previous tonnages for old customers. The restrictions prevent many foundries from increasing melt.

For the most part, shipments of both northern and southern iron show only moderate lag. Inventories are universally low.

Birmingham — Little easing of tightness in pig iron is evident as a result of the steel strike settlement. Merchant iron melters are producing at capacity but not in sufficient tonnage to take care of all requirements. Observers believe the situation will further tighten before it shows greater improvement. Producers express open dissatisfaction with the recently granted 75-cent increase by OPA.

Chicago — Limited supply of pig iron and coke operate to continue the bottleneck in castings. Most foundries are improving their position as to manpower

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and would lengthen work hours and increase melts were it not for shortage of materials. Lack of iron is not known to have halted production but inventories are far below the allowable limit. Coke in many cases is virtually on a day to day basis, and possibility of a coal strike April 1 causes a pessimistic view of the future. Of the district's 41 blast furnaces, 35 are operating. Until the coal issue is settled, no increase in this figure is likely.

Philadelphia—The larger blast furnace stack of one district producer, which was slow in resuming after the strike because of minor repairs produced its first basic a few days ago, contributing to urgently needed supply. Terrific pressure is being brought on sellers by the soil pipe

makers and also by pressure pipe makers, all having increasing backlogs. Importance of the soil and pressure pipe makers to the national housing program eventually may give them an advantage in obtaining iron over other foundries, although all except steel foundries are deluged with business. Their needs are the heavier because labor no longer is the bottleneck and cast scrap is even scarcer.

Boston — Maintenance of operations still depends on arrival of car lots of pig iron on emergency schedule in numerous instances. With few exceptions consumers have well under 30 days supply and only slight progress is apparent in building toward that point, with available iron spread thin over a large number.

Scrap . . .

Scrap Prices, Page 160

Scrap supply shows no sign of increase, plants usually supplying industrial scrap being slow to get into production after the steel strike. Railroad offerings also are small. Pressure for higher ceilings is being exerted as costs of preparation have increased. Meanwhile steelmakers are taking all material offered them as return to high rate of steel production increases needs.

Pittsburgh — Barring possibility of a coal strike April 1, consumption of scrap likely will increase over the next few months. Settlement of General Motors Corp.'s and General Electric Corp.'s strikes, plus a gradual resumption of operations at many other metalworking plants closed by strikes recently, should result in a steady increase in production scrap over the next 30 days. However, scrap supply continues to run far behind potential requirements of mills here, and there is some doubt a high level of steel production can long be sustained unless scrap comes out more plentifully. Springboards up to \$2.50 per ton on heavy melting steel are being paid in effort to attract scrap into this district. Recent railroad scrap offerings also have been well below normal.

Buffalo — With demand increasingly greater than supply scrap dealers see little hope of a better situation as principal producers are still far short of normal operation. A local mill consumer has taken an 1100-ton offering of heavy railroad scrap at the railroad's highest basing point price, exceeding the local OPA ceiling. In spite of pressure for material one mill reports increased rejections because of alloy content.

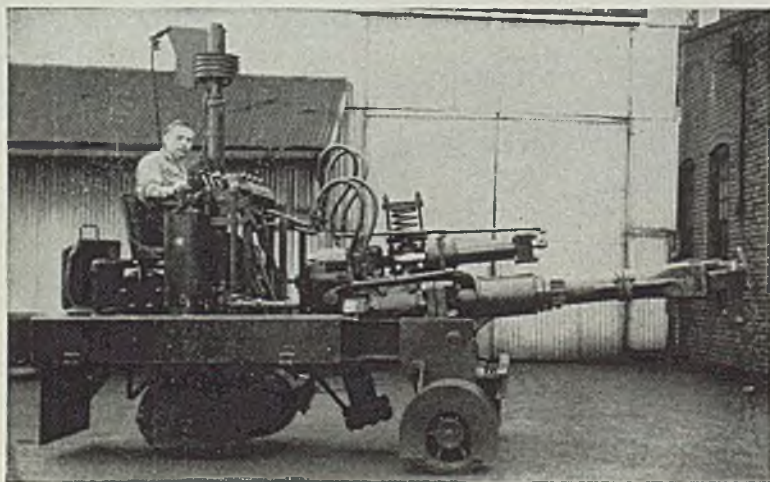
Cincinnati — Dealers in iron and steel scrap anticipate a seasonal improvement in available tonnage, though likely inadequate for the active demand. Meanwhile inquiries for all grades flood the market, the pinch in pig iron aggravating the demand. Reserves of some melters are fair, but dealers' yards hold light inventory.

St. Louis — Scrap shipments are improving a trifle, with premium grades scarce. Increasing post-strike mill demand is increasing the pressure steadily. Labor at collection points and in processing yards continues to be a bottleneck plus continuing decline in production of industrial scrap. Mill reserves are reported at 30 to 60 days, but demand is unabated. Foundries also have fair reserves. Prices remain at ceilings.

Cleveland—Dealers are making every effort to obtain scrap sufficient to meet mill demand but find supply short and are not able to supply enough to keep inventories even. The situation is out of step, steel production being at a high rate but consuming plants are not operating to a degree to supply the quick return industrial scrap usually available. Observers believe a scrap campaign to obtain tonnage from households and farms would not produce much as prices are not attractive to farmers or collectors. Scarcity is expected to continue for months.

Birmingham — Scrap continues scarce even though practically no tonnage moved into mills during the strike. Demand continues strong and reports indicate a shortage will be evident for sev-

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eral months at least. Also heard in the district are reports that scrap ceilings will be raised as a result of increased steel prices.

Chicago — Tightness continues in scrap here, with orders exceeding brokers' ability to fill, and prices holding firmly at full ceiling. Scrap is being produced by manufacturing plants at an extremely low level because most have little steel to sustain operations. Consequently, dealers' yards are relatively clean. Reliable information has been received to indicate that scrap ceilings will not be lifted by OPA as was expected by some quarters in view of the recent relief granted in steel prices. Opinions on this matter are mixed. Nevertheless, there is a decided inclination to press for a wider spread between unprepared and prepared scrap.

Boston — Supply of No. 1 melting steel scrap continues limited and some consumers normally buying that grade are accepting No. 2. One steel mill is depending heavily on railroad scrap. Yards are tending toward preparation of low phos material where available for the differential. Some shipments are more carefully inspected as to this grade. Supply of bundles is tight, reflecting the decline in industrial scrap production. Limited offerings of unprepared are reflected in bids in which the \$3.50 spread for preparation is shaded. Shortage of cast tends to hold down foundry melts in some instances.

New York — Brokers report that while movement in melting steel is a little better the increase is not up to the usual March standard because open weather the past winter has permitted a reasonably free flow. Moreover, shipments are retarded by the fact that termination material at plants formerly engaged in war work has been fairly cleaned up, without its loss being adequately offset by resumption of scrap as a by-product of reconversion activities. Pittsburgh consumers still are in the market here, although most of the heavy melting steel is going to eastern Pennsylvania and Sparrows Point, Md. The situation in cast scrap remains acute.

Philadelphia — Outlook in scrap continues strong. Scarcity in cast grades has seldom been more pronounced as supply has not improved and pig iron is increasingly tight. The situation promises to become worse when two large district consumers now strikebound get back into operation. Cast consumers now are paying as high as \$7 freight in effort to get tonnage. Melting steel scrap also is tight and even though spring is at hand the movement is not expected to be greatly accelerated in this district, because winter collections have been aided by open weather. The advance in pig iron was not large enough to stimulate much agitation for higher scrap prices and there has been little comment about it in the local scrap trade.

CPA Asks Household Drive To Rebuild Scrap Reserve

Civilian Production Administration has appealed to householders to scour their premises to help provide an additional two million tons of steel and iron scrap over the next four to six months, to meet the expanding demand for housing needs

and consumer goods. Need for scrap has become doubly imperative at this time because the expected huge flow of battlefield scrap to this country will not materialize. Government officials who recently returned from Europe report that total scrap available to this country would amount to less than a month's requirements for steel mills operating at capacity.

Householders, farmers and small manufacturers must be depended on as the principal source to provide the scrap, CPA says, as it appears doubtful if there will be much scrapping of equipment by railroads and large industrial plants until the new equipment is available in quantity. These were two of the principal sources of scrap in prewar days.

From an estimated 5,600,000 tons of scrap reached at the height of the War Production Board drive in 1943 the scrap stockpile had dropped to 3,000,000 tons at the end of the war. This is a bare working minimum, CPA says.

Old Lake Carriers To Be Scrapped in Canada

Hulls of 29 over-age Great Lakes freighters sold by the Maritime Commission last fall to By-Products Iron & Steel Corp., Cleveland, will be moved to Hamilton, Ont., to be cut into scrap, the Maritime Commission states. Approval of the plan to scrap the ships at

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the plant of the Steel Co. of Canada has been given on condition an additional \$50,000 bond be furnished for each ship. Salvageable equipment is being removed from the vessels, which are laid up at Erie, Pa., and the plan is to tow one vessel through the Welland Ship Canal every three or four days after navigation opens.

By-Products Iron & Steel Corp. was awarded the entire fleet on a bid of \$300,137.10 last November. Terms of sale prohibited use of the ships in transportation or for storage purposes for 10 years.

Refractories . . .

Refractories Prices, Page 159

Pittsburgh — Trade reports indicate some action aimed at advancing prices for refractories may develop shortly. Last June prices for fire clay and silica refractories were raised 3 per cent, and since March, 1942, selling prices have been advanced only 6 per cent, compensating only in small part substantial increases in costs. Continued heavy demand for refractories is anticipated through remainder of this year. Sellers generally are 2 to 3 months behind on deliveries, and this situation will be further extended should prospective strike of CIO-United Stone and Allied Products Workers International Union materialize. Strike would involve workers in 90 per cent of the companies making refractories east of the Mississippi river, and is said to have been approved by 60 per cent of the union members.

Metallurgical Coke . . .

Coke Prices, Page 157

Pittsburgh — Coke supply has eased somewhat since settlement of steel strike, and although still tight, it is in substantially better supply than pig iron or scrap. By-product coke output is at practical capacity, and beehive operations are estimated at about 70 per cent. Consumers are attempting to augment coke stocks prior to threatened coal strike April 1. However, sellers state there is not enough free coke to permit significant increase in consumers' inventories. Sellers are booking all tonnage offered by consumers, but are making only tentative delivery promises. Upward trend in coal and coke prices is expected to develop out of UMW's demands.

Warehouse . . .

Warehouse Prices, Page 158

Pittsburgh — Distributors experienced moderate improvement in mill shipments last week, particularly in small hot-rolled carbon and cold-finished bars, and SAE bar stock. Although mill deliveries are restricted on most sheet items, notably galvanized, and on wide flange structurals, distributors' inventories are in better balance and are approaching a more satisfactory overall volume.

Distributors state amendment 38 to RPS-49 does not permit passing on to consumers percentage increase in extras on alloy and specially items granted steel producers, and no consideration was given to increased wage rates distributors must meet, also fact selling prices were

not revised upward at time mill prices were increased last May.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3000 tons, Baltimore & Ohio bridge at Point Pleasant, W. Va., to American Bridge Co., Pittsburgh.

1600 tons, sheet piling, dock wall and mooring basin, Milwaukee, for city, to Carnegie-Illinois Steel Corp., Chicago; Great Lakes Dredge & Dock Co., Chicago, contractor; bids March 6.

1500 tons, Burdines department store, Fort Lauderdale, Fla., to Bethlehem Steel Co., Bethlehem, Pa.

1000 tons, penstock coaster gates, for Grand Coulee dam, Grand Coulee, Wash., for U. S. Bureau of Reclamation, to Consolidated Steel Co., Los Angeles.

1000 tons, Memorial Hospital building, East 68th St., New York, to American Bridge Co., Pittsburgh.

800 tons, paper mill, Los Angeles, for United States Gypsum Co., to Kansas City Structural Steel Co., Kansas City, Kans.; bids Feb. 6.

800 tons, plant for Michael Flynn Mfg. Co., Philadelphia, to Belmont Iron Works, Philadelphia.

700 tons, Maryland state bascule bridge at Spa Creek, Md., to American Bridge Co., Pittsburgh.

640 tons, DPG spans, bridge 842.33, Black Fork river, Wyo., for Union Pacific railroad, to Kansas City Structural Steel Co., Kansas City, Kans.

560 tons, four manufacturing plants, various locations, for International Furniture Co., to American Bridge Co., Pittsburgh.

500 tons, highway bridges, Cleburne and Cranbury, Tex., for Texas State Highway Commission, to Virginia Bridge Co., Roanoke, Va.

480 tons, building, Second Avenue Bus Line, New York, to American Bridge Co., Pittsburgh.

400 tons, building, Chicago, for American Colortype Co., to Bethlehem Steel Co., Bethlehem, Pa.; S. N. Nielsen Co., Chicago, contractor; bids Feb. 4.

390 tons, beam spans, Los Angeles, for Atchison, Topeka & Santa Fe railroad, 230 tons to American Bridge Co., Pittsburgh, and 160 tons to Joseph T. Ryerson & Son Inc., Chicago.

300 tons, woodworking plant, Cornelia, Ga., for International Furniture Co., to American Bridge Co., Pittsburgh.

290 tons, miscellaneous including 144 tons sheet and H-piling, intake crib, Waukegan, Ill., for Public Service Co. of Northern Illinois, to Carnegie-Illinois Steel Corp., Chicago; N. S. Mackie Co., Chicago, contractor; bids Feb. 26.

260 tons, beam spans, Harlingen or San Benito, Tex., for State Highway Department, to Virginia Bridge Co., Roanoke, Va.

235 tons, warehouse, Miami, Fla., for Louis Kasoff, to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, Bell Telephone Co. building at Jenkintown, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

104 tons, beam spans, Newcastle, Wyo., for State Highway Department, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

STRUCTURAL STEEL PENDING

2900 tons, sheet piling, and bearing piling and accessories, Keweenaw waterway revetment, Houghton, Mich., for U. S. Engineer, Duluth; bids March 22.

2250 tons, bridge, nine 150-foot deck girder spans, Missouri river, Garrison dam site, N. Dak.; bids April 11, U. S. engineer, Omaha, Nebr.

1500 tons, No. 2 toll office building, Chicago, for Illinois Bell Telephone Co.; bids March 11.

1480 tons, steel piling for bridge substructure at Chesapeake City, Md.; bids to U. S. Engineers, Philadelphia, April 2; 1060 tons are bearing piles and 420 tons sheet piling; 620 tons reinforcing bars also required.

1400 tons, addition for Western Electric Co., Baltimore.

1250 tons, 16 tainter gates, Caddo, Colo., for U. S. Bureau of Reclamation.

1200 tons, plant, Utica, N. Y., for Continental Can Co., New York; bids asked.

790 tons, Navy cafeteria and auditorium at White Oak, Md.; Charles H. Tompkins, Washington.

580 tons, bridge for Virginia highway department, over Shenandoah river at Luray, Va.; bids March 19.

500 tons, plant extension for Eastern Shore Public Service Corp., Vienna, Md.; bids March 26.

410 tons, Virginia state bridge, over Tye river.

400 tons, Lehigh Farmers' Co-Operative Dairy, Allentown, Pa.

400 tons, Sacred Heart hospital, Norristown, Pa.; bids March 28.

350 tons, maintenance work, Gulf Oil Corp., Philadelphia; bids April 2.

300 tons, extension, St. Clair engine house, Pennsylvania railroad, Columbus, O.; bids March 28.

300 tons, skating rink, South Chicago, for South Shore Arena.

800 tons, gate frame, Davis dam, Louise, Ariz., for U. S. Bureau of Reclamation.

200 tons, factory building, Gretna, La., for Southern Cotton Oil Co.

170 tons, Pennsylvania state highway bridge, Scranton, Pa.; bids closed March 19.

130 tons, Virginia state bridge over Nottoway river.

120 tons, American Gas & Electric Co., New York.

110 tons, auto sales building, Allinel Realty Co., Philadelphia; bids closed March 20.

Unstated, two 350-ton overhead traveling cranes for Grand Coulee; bids to Denver, April 15.

public Flow Meters Co.

Unstated, one T-beam and two flat slab state bridges, King county, Washington; bids to Olympia, April 2.

PIPE . . .

CAST IRON PIPE PLACED

540 tons, 36,000 feet, and fittings, for Yakima, Wash., to H. G. Purcell, Seattle for U. S. Pipe & Foundry Co., Burlington, N. J.

322 tons, 12, 8 and 6-inch, for Bremerton, Wash., to H. G. Purcell, Seattle, for U. S. Pipe & Foundry Co., Burlington, N. J.

Unstated, improvement at Colfax, Wash., to three suppliers.

CAST IRON PIPE PENDING

600 tons, Maplewood water district, Portland,

Oreg., over 50,000 feet of 10 to 2-inch; bids in.

410 tons, pit cast, cement-lined, bell and spigot; also 107 tons of cement-lined castings and 44 tons specials; bids April 4, Metropolitan District Commission, water division, Boston.

200 tons, two improvements, Tacoma, Wash.; general contracts placed.

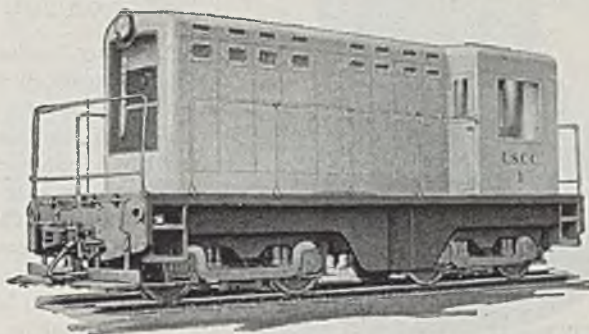
PLATES . . .

STEEL PLATES PLACED

500 tons, estimated, 200,000-gallon elevated water tank and standpipe, Dennis, Mass.; 250,000-gallon elevated tank, Yarmouth, Mass., and standpipe, Sagamore, Mass., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

315 tons, six 10,000-barrel tanks, Knoxville,

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REINFORCING BARS . . .

REINFORCED BARS PLACED

515 tons, highway construction in Kentucky, for State Highway Department, to American Builders Supply Co., Louisville.

500 tons, building, Indianapolis, for Coca-Cola Co., to Hugh J. Baker & Co., Indianapolis.

REINFORCED BARS PENDING

2990 tons, McAlester, Okla., for U. S. Navy, Bureau of Yards and Docks.

2000 tons, Bayou Sirrel lock; bids April 10, U. S. engineer, New Orleans.

470 tons, Tucumcari, N. Mex., for U. S. Bureau of Reclamation.

375 tons, Frankfort, Ky., for State Highway Department.

350 tons, reservoir, Ottumwa, Iowa, for Ottumwa Water Works; Arthur H. Neumann & Bros. Inc., Des Moines, low on general contract; bids March 18.

300 tons, Louisville, Ky., for Belknap Hardware Co.

250 tons, factory, Danville, Ill., for Delco Division, General Motors Corp.

225 tons, embankment and outlet works, flood control, Buffalo Bayou, Tex.; bids April 8, U. S. engineer, Galveston, Tex.

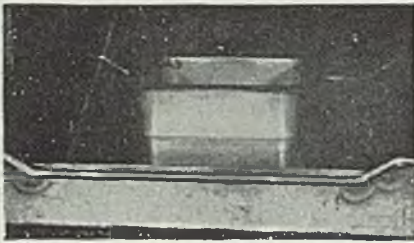
205 tons, Mountain Brook dam, Jaffrey, N. H.; bids April 3, U. S. engineer, Boston.

200 tons, four state bridges Whitman county, Washington; general contract to Sather & Sons, Seattle.

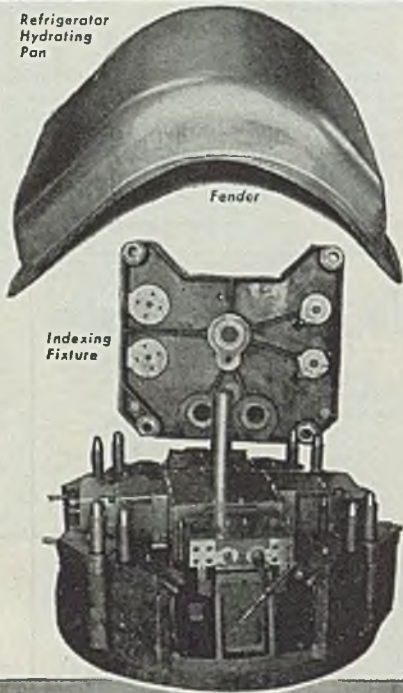
200 tons, factory building, Madison, Wis., for Forsberg Paper Box Co.; bids March 18.

122 tons, highway construction, Franklin, Ind., for State Highway Department.

120 tons, factory addition, Chicago, for Re-



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Tenn., for Pure Oil Co., to Graver Tank & Mfg. Co. Inc., Chicago; bids Feb. 25.

300 tons, water pipe for Tacoma, Wash., to Western Pipe & Steel Co., San Francisco.

250 tons, seven fish barges for Alaska packers, to Hydraulic Supply Mfg. Co., Seattle.

Unstated, elevated water tank and tower for Ontario, Oreg., to Chicago Bridge & Iron Co., Chicago.

PLATES PENDING

3000 to 4000 tons, 30 to 54-inch, water system replacements, Tacoma, Wash.; bids soon.

RAILS, CARS . . .

RAILROAD CARS PLACED

Erie, seven lightweight sleeping cars, to Pullman-Standard Car Mfg. Co., Chicago.

RAILROAD CARS PENDING

Pittsburgh & West Virginia, 200 seventy-ton gondolas.

Allegheny Ludlum Revises Policy on Job Seniority

Allegheny Ludlum Steel Corp., Pittsburgh, announced last week it has executed an agreement with the United Steelworkers of America that all production workers including returning veterans will be assigned to jobs on the basis of union contract seniority. This is a departure from the practice followed in recent years under which employees returning from military service have been accorded "super-seniority," resulting in some cases in the veterans displacing employees with greater length of service in the company's employ.

Ralph C. Edgar, company personnel director, explained the change in re-employment policy was dictated largely by a decision handed down Mar. 4 by the United States Circuit Court of Appeals, Second Circuit, which interpreted the re-employment provisions of the Selective Training & Service Act of 1940 to mean that a veteran should be restored to his original position without loss of seniority, rather than be accorded "superseniority."

"The ambiguous wording of the re-employment provision of the law has placed the company in a difficult position between the demands of the veterans on one hand and non-veterans on the other," Mr. Edgar said.

"Gen. Lewis B. Hershey, director of Selective Service, announced in May, 1944, that veterans are entitled to reinstatement to their jobs for one year regardless of the seniority claims of the non-veterans. In many companies, this interpretation was challenged and conflicting seniority claims of veterans and non-veterans were submitted to arbitrators and to the courts. Rulings were made both ways. Federal district courts in Ohio and New York sustained superseniority, but federal district courts in Michigan and Illinois ruled against it. The situation remained confused. Congress has thus far failed to

clarify the law despite many requests, including one from the President of the United States.

"We believe the Mar. 4 decision of the Second Circuit Court tipped the weight of legal authority against General Hershey's interpretation," Mr. Edgar stated.

Decline Expected in 1946 Lake Shipments of Iron Ore

(Concluded from Page 67)

33,647,260 as of Mar. 1 compared with 39,058,650 as of Jan. 1. At the start of the navigation season in recent years, stocks at the lower lake ports and at furnaces amounted to about 17½ million in 1945, 21 million in 1944 and 25 million gross tons in 1943. Prospective consumption was much higher for these years. Present stocks are sufficient to cover requirements for at least five months. Consumption totaled only 1,748,469 tons in February compared with 3,718,958 in January.

The lake shipping season opens Apr. 15, the date on which insurance becomes effective, but no ore vessels are expected to leave their docks until sometime between April 22 and May 1. Since there is no urgent need for early shipments, the vessel operators are expected to await more favorable weather conditions. Latest reports on ice conditions at the Straits of Mackinac and Sault Ste. Marie indicate passage will be possible around Mar. 25.

Coal shippers, on the other hand, are anxious to get shipments under way and are working against the threat of a strike Apr. 1. Some ships at Lake Erie docks have been loaded during the past week to 10 days and others are being loaded as rapidly as possible. Some shippers are making special insurance arrangements and will start sailings of coal carriers around Mar. 25. The movement of coal to upper Great Lakes ports is expected to total around 51 million tons for the season, or slightly under the 1945 total.

The Solid Fuels Administration for War has rescinded its order which required the agency's permission to ship coal from the mines to lakefront. This order had been issued originally to conserve supplies for household and other essential uses. The Coal & Ore Exchange, Cleveland, is issuing permits for the movement of coal from mines to lake forwarders on regular season consignments.

Shipments of grain during the 1946 season are indefinite since at present there are only four cargoes available. Limestone shipments are expected to hold fairly steady at around 17 million tons.

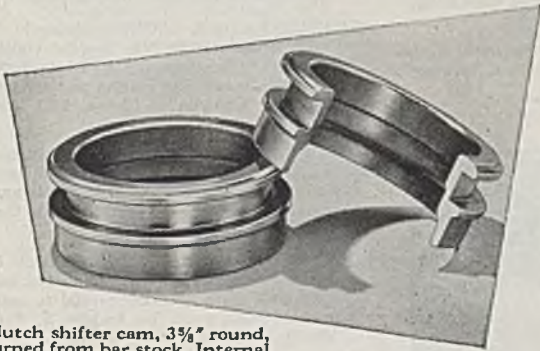


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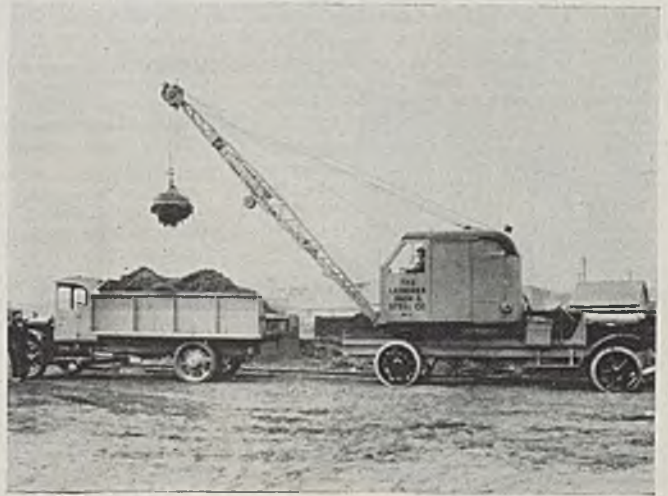
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CONSTRUCTION AND ENTERPRISE

ALABAMA

BIRMINGHAM—Tennessee Coal, Iron & Railroad Co. will take bids soon for a warehouse at Memphis, Tenn., one story, 200 x 245 feet, to serve Arkansas and parts of Tennessee and Mississippi. George R. Mitchell will be in charge of the new warehouse.

ILLINOIS

CHICAGO—Signode Steel Strapping Co., 2600 North Western Ave., has let contract to J. E. Anderson & Son., 1809 West Balmoral St., for a two-story top addition to its plant, to cost about \$150,000. Burnham Hammond, 160 North LaSalle St., are architects.

CHICAGO—Columbia Pipe & Supply Co., 3610 South Morgan St., has let contract to Algot Larson, 3887 West Lake St., for a plant building estimated to cost about \$250,000.

CICERO, ILL.—Schneider Metal Mfg. Co., 1805 South 55th Ave., has let contract to G. L. Cullen Co., 2940 West Lake St., Chicago, for a plant addition to cost about \$100,000. Johnson & Johnson, 111 West Washington St., Chicago, are consulting engineers.

DELAVAN, ILL.—City has approved bond issue for referendum vote on construction of waterworks and sewage disposal plant to cost \$130,000. Austin Engineering Co., Peoria, Ill., is engineer.

NORTH CHICAGO, ILL.—Zapon Division of Atlas Powder Co., Marguette St., has let contract to Campbell-Lowrie-Lautermilch, 400 West Madison St., Chicago, for a five-story steel plant building estimated to cost about \$300,000.

ROCKFORD, ILL.—J. G. Clark Mfg. Co. will build brick and steel warehouse 100 x 185 feet to cost about \$54,000.

MASSACHUSETTS

CAMBRIDGE, MASS.—National Research Co., 100 Brookline Ave., has let contract to Thomas O'Connor & Co., 238 Main street, for a factory, laboratory and office estimated to cost about \$500,000.

MICHIGAN

CHEBOYGAN, MICH.—Cheboygan Foundry & Mfg. Co. Inc., 904 North Huron Ave., has been incorporated with \$40,000 capital to do general foundry work, by Donald S. MacInnis, 112 South C St.

DETROIT—Taylor Electric Steam Products Co., 19797 Livernois Ave., has been incorporated with \$10,000 capital to manufacture electrical and steam appliances, by George M. Taylor, same address.

DETROIT—Den-Ark Tool & Die Co., 17170 Rockdale Ave., has been incorporated with \$100,000 capital to manufacture tools, dies and machine parts, by Bryant Bratton, same address.

DETROIT—Reid Burner Co., 11637 Linwood Ave., has been incorporated with \$100,000 capital to manufacture gas furnaces, by Thomas J. Reid, 729 Sunset Ave., Windsor, Ont.

DETROIT—Union Engraving Co., 10318 Shoemaker Ave., has been incorporated with 500 shares no par value to engage in diemaking, by Emil Kraus, 12529 Wilfred Ave.

DETROIT—Universal Friction Materials Co., 1714 United Artists Bldg., has been incorpo-

rated with \$300,000 capital to manufacture friction materials, by Henry I. Armstrong Jr., 1400 Buhl Bldg.

DETROIT—Automotive Experimental Co., 8400 Woodward Ave., has been incorporated with \$50,000 capital to manufacture castings, tools, implements and machinery, by Nicholas Radulescu, 13531 Woodrow Wilson Ave.

DETROIT—Bulldog Factory Service Inc., 425 South Campbell Ave., has been incorporated with 5000 shares no par value to manufacture labor-saving machinery, by Percy Edick, 6450 Floyd Ave.

DETROIT—Cutting Specialties Inc., 1962 Penobscot Bldg., has been incorporated with \$25,000 capital to manufacture cutting tools, by Francis M. Slater, 1347 Audubon Ave., Grosse Pointe Park, Mich.

DETROIT—Hartsell Screw Products Inc., 9385 American Ave., has been incorporated with \$100,000 capital to manufacture screw machine products, by Joseph L. Hartsell, 2240 West Grand Blvd.

DETROIT—Industrial Die Cast Corp., 1750 East McNichols Rd., has been incorporated with \$250,000 capital to manufacture dies and die castings, by Wills B. Anderson, 18715 Bretton Dr.

DETROIT—Industrial Machine Products Inc., 1647 Penobscot Bldg., has been incorporated with \$250,000 capital to manufacture metal products, by Arnold R. Miller, 359 South Jesse Ave.

EAST DETROIT, MICH.—Speedlin Industries Inc., 22644 Gratiot Ave., has been incorporated with \$50,000 capital to manufacture metal products, by Joseph Stocki, 22486 Lange Blvd., St. Clair Shores, Mich.

GRAND RAPIDS, MICH.—Federal Mogul Corp., 9 Ransom St. NE., has let contract to Becklinger Construction Co., 2140 Horton St. SE., for a warehouse costing about \$250,000. Robinson, Campau & Crowe, 760 Michigan Trust Bldg., are architects.

ONAWAY, MICH.—Black River Products Corp., has been incorporated with \$25,000 capital to manufacture automobile parts, tools and machinery, by Sid Bakewell, 2655 Cortland Ave., Detroit.

ROSEVILLE, MICH.—Midwest Broach & Engineering Co., 28540 Utica Rd., has been incorporated with \$20,000 capital to manufacture precision tools, by Andrew S. Erickson, 18639 Westphalia Ave., Detroit.

SAGINAW, MICH.—Harris & Fischer Iron Works Inc., 1105 South Water St., has been incorporated with \$75,000 capital to do general steel and iron manufacturing, by George H. Fischer, 1418 Wheeler St.

MISSOURI

ST. LOUIS—Midwest Piping & Supply Co., 1450 South Second St., has let contract to Fruin-Colnon Contracting Co., 1706 Olive St., for a one-story 52 x 388-foot plant building, to cost about \$75,000.

ST. LOUIS—McCabe Powers Auto Body Co., 5900 North Broadway, has let contract to Fruin-Colnon Contracting Co., 1706 Olive St., for a one-story 37 x 109-foot plant addition. Schmidt & Cook, Givens Hall, Washington University, Skinker and Lindell Blvd., are architects.

ST. LOUIS—Joseph Pavelka, 636 Tower Grove Ave., has let contract to W. C. Harting Construction Co., 722 Chestnut St., for a one-story 73 x 150-foot machine shop addition, to cost over \$40,000, with equipment.

ST. LOUIS—Pittsburgh-Erie Saw Corp., 1569 Tower Grove Ave., has let contract to William H. & Nelson Cunliffe Co., 3320 Lindell Blvd., for a one-story 50 x 249-foot plant addition.

ST. LOUIS—Vestal Chemical Laboratories Inc., 4963 Manchester Ave., has let contract to Woermann Construction Co., 3800 West Pine Blvd., for plant additions to cost about \$100,000. Work includes one and two-story build-

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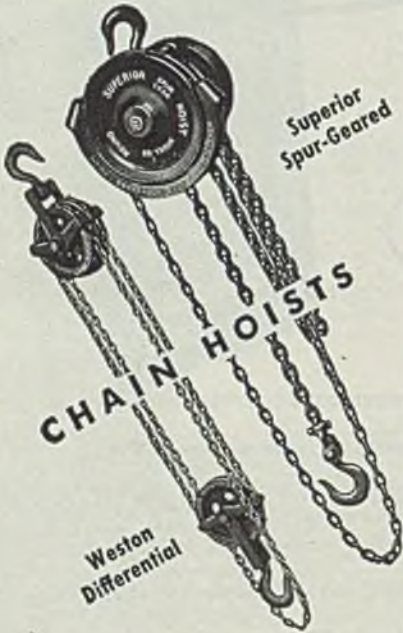
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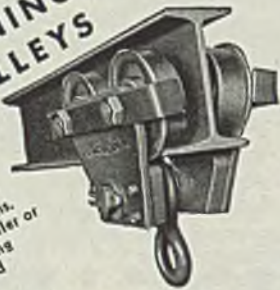
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ings 120 x 130 feet, 19 x 120 feet and 20 x 86 feet.

NEW JERSEY

METUCHEN, N. J.—Ford Motor Co., Dearborn, Mich., has let contract to Wigton-Abbott Corp., 1225 South Ave., Plainfield, N. J., for an automobile assembly plant, to cost about \$500,000.

NEW YORK

BUFFALO—Pratt & Lambert Co. Inc. has plans for an expansion program costing about \$325,000, one-third of which will be for machinery and equipment.

NORTH CAROLINA

CHARLOTTE, N.C.—Southern Bearings & Parts Co., 303 East Fifth St., has let contract to Southeastern Construction Co., 218 West Second St., for a warehouse plant, to cost about \$40,000.

GREENSBORO, N. C.—Container Corp. of America, 111 West Washington St., Chicago, plans new plant here, 200 x 400 feet, one story, on eight-acre site. Ballinger Co., Philadelphia, is architect and engineer, Ira C. Keller, vice president, will be in charge of operations.

OHIO

BARBERTON, O.—Seiberling Rubber Co., 345 Fifteenth St., will build a three-story addition 40 x 90 feet and do considerable remodeling of present plant, at cost of about \$80,000. H. P. Shrank, vice president, is in charge.

CLEVELAND—International Molded Plastics Co. Inc., George Goulder, president, has let contract for a manufacturing and office building to cost about \$50,000 at 4980 Broadview Rd.

CLEVELAND—Cuyahoga Soap Co., 808 Denison Ave., will build a rendering plant 60 x 150 feet and boiler plant 42 x 44 feet, at cost of about \$60,000. W. E. Butler is general manager.

CLEVELAND, O.—Williams & Co. Inc., J. H. Penske, district manager, 3700 Perkins Ave., is building a warehouse addition 60 x 103 x 191 feet, with loading dock, overhead conveyor and runway, with provision for additional story later, cost estimated at \$50,000.

CLEVELAND—Brookpark Industries Inc., 2550 Brookpark Rd., has let contract to Sam W. Emerson Co., 1836 Euclid Ave., for a one-story 100 x 100-foot machine shop, to cost about \$50,000.

CLEVELAND—Industrial Rayon Corp., Herman Rivitz, chairman, 9801 Walford Ave., has let contract to G. A. Rutherford Co., 2725 Prospect Ave., for a one-story 52 x 63-foot boiler house, to cost about \$150,000. McGeorge & Hargett, 9400 Quincy Ave., are engineers.

FINDLAY, O.—Ohio Oil Co., Findlay, has let contract to Sam W. Emerson Co., 1836 Euclid Ave., Cleveland, for a six-story 50 x 200-foot factory and office building, to cost about \$400,000. Wilbur Watson Associates, 4614 Prospect Ave., Cleveland, are engineers.

MANSFIELD, O.—Ohio Brass Co., 380 North Main St., will take bids soon on a one-story foundry addition 42 x 165 feet, to cost about \$50,000.

WARREN, O.—Peerless Electric Co., 1401 West Market St., R. Krochle, president, is building a manufacturing and warehouse addition, three stories, 100 x 176 feet.

WOOSTER, O.—Wooster Mfg. Co., is being organized by Leon Glick, 251 Elm Drive, Wooster, and associates to manufacture farm implements and will build a one-story plant 60 x 100 feet.

OREGON

FORTLAND, OREG.—United States Forest Service is considering bids for 20 special

forest trail tractors, with bulldozers, 22 water pump assemblies for mounting on trucks and ten engine-driven rotor gear pump units.

THE DALLES, OREG.—Northwest Chemurgy Co-Operative will ask bids soon for a \$1 million plant to produce dextrose and dextrine from wheat. H. P. Christensen, master of Washington State Grange, is interested.

PENNSYLVANIA

CHESTER, PA.—Philadelphia Electric Co., 900 Sansom St., will build an oil storage tank under separate contracts, at cost of about \$125,000.

JOHNSTOWN, PA.—Cambris Equipment Co., 1 West Iron St., has let contract to Berkebile Bros., 625 Swank Bldg., for a two-story 125 x 125-foot storage building, to cost about \$165,000.

PHOENIXVILLE, PA.—Phoenix Mfg. Co. has let contract to Hughes-Foukrod Co., 1505 Race St., Philadelphia, for a plant addition to cost about \$40,000. Wenner & Chance, 1500 Walnut St., Philadelphia, are architects.

SHARON, PA.—Frantz Machine Co., Vine and Franklin Ave., will build a two-story plant addition 70 x 110 feet. Edward Frantz is owner.

RHODE ISLAND

PHILLIPSDALE, R. I.—Bird & Son Inc., Dexter Rd., East Providence, R. I., will let contract soon for replacement of boiler and turbine departments and power plant addition, to cost over \$40,000. J. A. Steveis Co., 16 Shattuck St., Lowell, Mass, is architect.

TEXAS

DALLAS, TEX.—Metal Goods Corp., 2500 South Ervay St., has let contract to Frazier & Davis Construction Co., 1319 Hackland Ave., St. Louis, for a warehouse 137 x 402 feet and loading dock 45 x 60 feet, to cost about \$175,000.

HOUSTON, TEX.—International Rubber & Plastic Co. has let contract to Marx & Son, 1921 Westheimer Rd., for a one-story plant building 150 x 150 feet, to cost about \$100,000.

HOUSTON, TEX.—Mosher Steel Co., 3910 Washington Ave., will build a plant addition to cost about \$45,000.

WASHINGTON

CENTRALIA, WASH.—City is considering plans for proposed \$115,000 municipal power system, including a \$25,000 transformer and three automatic substations.

DAYTON, WASH.—Braden Tractor & Implement Co., First and Poplar Sts., Walla Walla, Wash., has let contract to A. Ritchie, Box 253, Walla Walla, for a 75 x 100-foot shop, to cost about \$45,000.

SEATTLE—Rex Industries, 8660 East Marginal Way, plans erection of an aircraft repair shop 50 x 80 feet, to cost about \$18,000.

SEATTLE—Universal Steel Fabrication & Oil Sales Co., Sixth and Mercer St., plans plant building 80 x 120 feet, to cost about \$40,000. Rolf E. Decker, is architect.

PORT ANGELES, WASH.—City is considering plans for a proposed sewage treatment and disposal plant costing \$240,000, submitted by Federal Works Agency.

VANCOUVER, WASH.—Bennett Paper Co. will build a warehouse 55 x 150 feet, to cost about \$30,000.

WISCONSIN

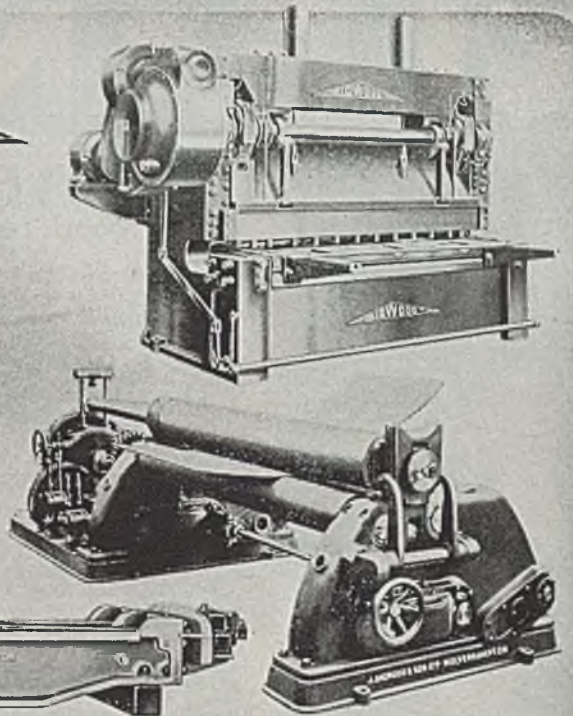
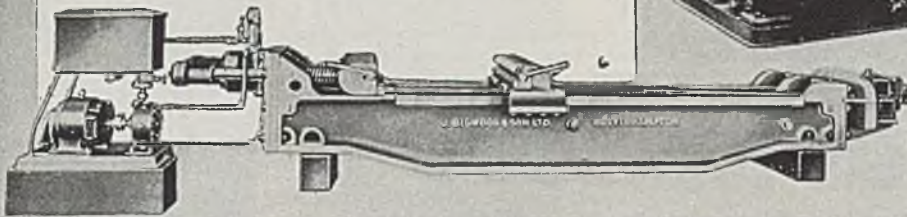
GREEN BAY, WIS.—LaPlant Appliances has let contract to F. Zeise, 433 South Van Buren St., for a one-story 40 x 200-foot warehouse. R. W. Surplice, City Center Bldg., is architect.

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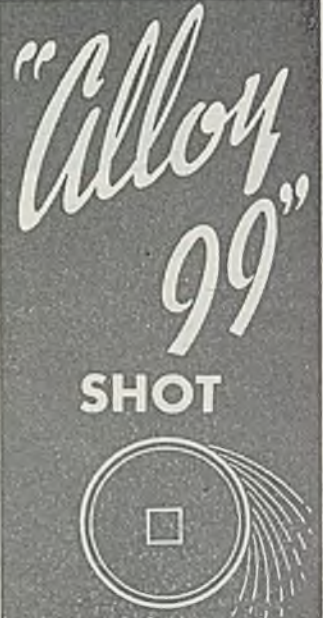


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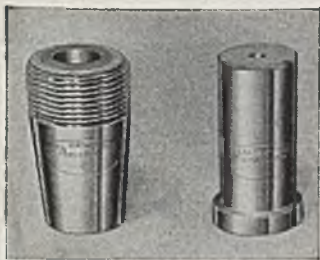
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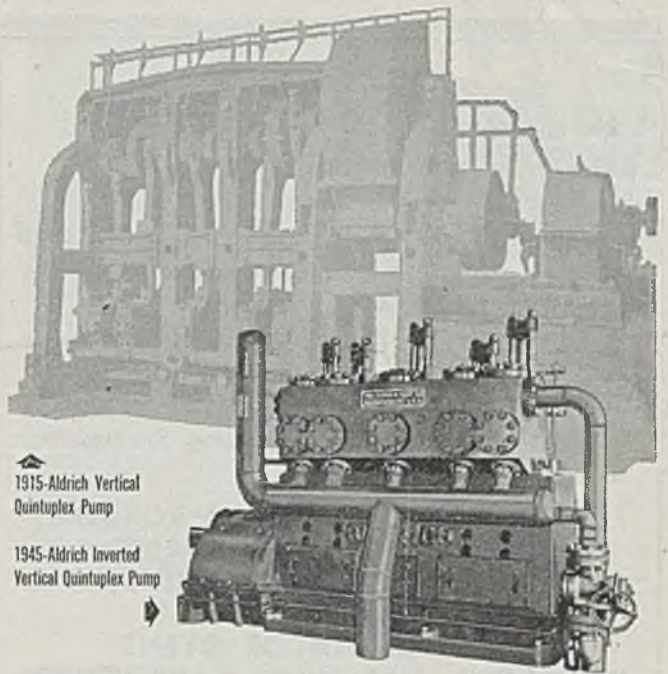
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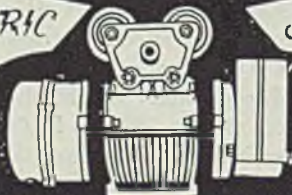
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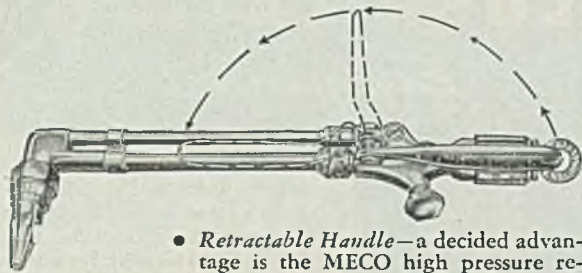
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