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NEXT WEEK . . .

Carbon Absorption of 18-8
Variable Voltage Drives
Why Use E6012 Electrodes?
New Metallurgical Laboratory
One in Ten an Inspector

STEEL

The Magazine of Metalworking and Metalproducing

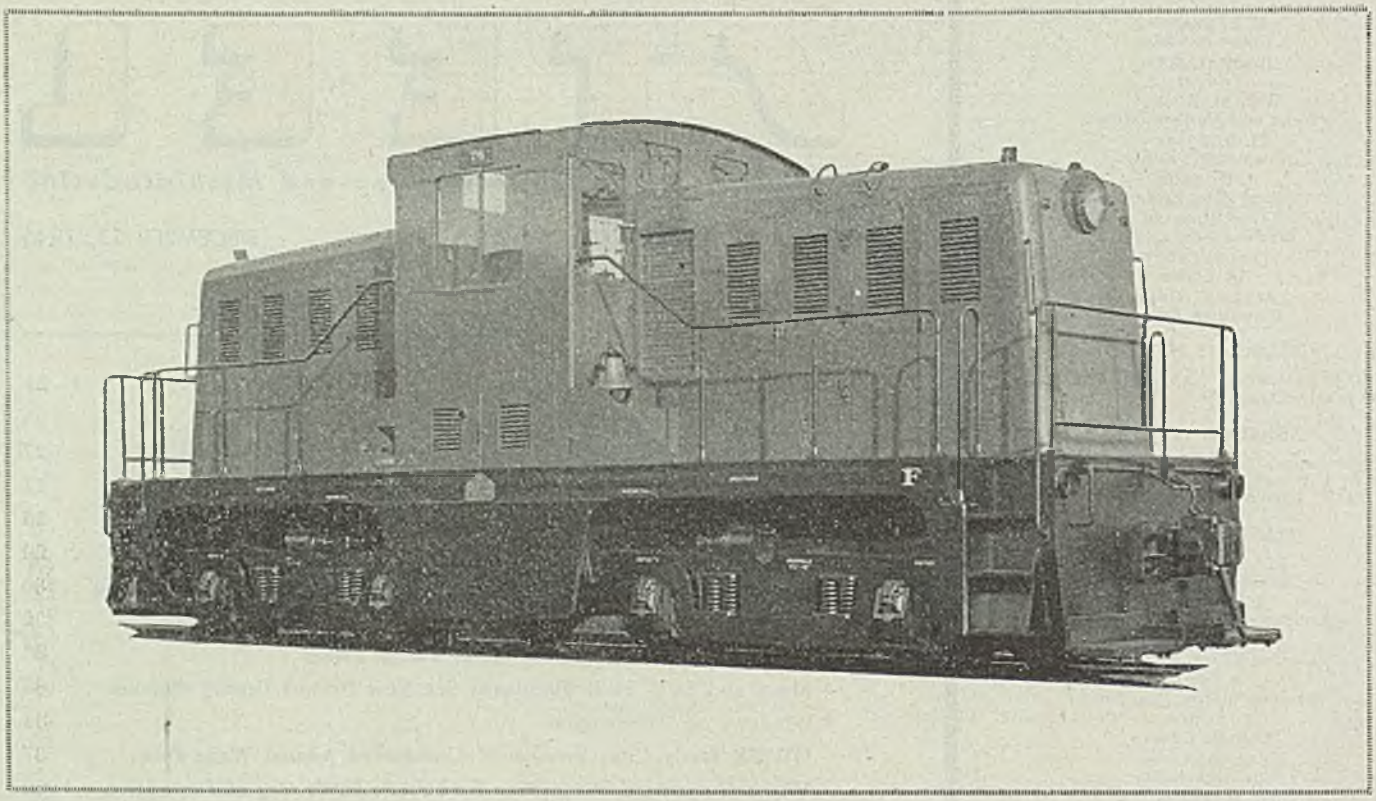
VOL. 119 NO. 26 DECEMBER 23, 1946

NEWS

TECHNICAL

MARKETS

★—Denotes regular features.



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December 23, 1946

Another About-Face

In order to comprehend the most significant aspect of the first annual report of the Council of Economic Advisers, released by President Truman last Wednesday, one should review the circumstances under which this council was created.

It will be recalled that among the legislative "musts" advocated by President Truman shortly after the end of the war was a bill that would make "full employment" a primary objective of the federal government and would key many government activities to a program for achieving that objective. It was proposed that government economists would provide the President with a forecast of economic conditions to serve as a guide in formulating government policy.

The original idea was diluted considerably by debate in Congress but a semblance of it finally emerged in the Employment Act of 1946. This bill provided for a council of economists to report to the President on economic conditions affecting employment. The bill was passed at a time when most government economists, including Robert R. Nathan, were predicting serious unemployment within six months—a prediction which ran counter to the forecasts of business men and which later was proved to be 100 per cent wrong.

In view of these circumstances, industry feared that the Council of Economic Advisers might perpetuate the cock-eyed brand of New Deal economics. This fear was allayed considerably by the high caliber of the men appointed by the President.

Now the first report is out and the most striking feature of it is that it reveals an almost complete departure from New Deal economic thinking. Its forecasts conform more closely to the views of most industrialists. Its predictions contradict almost everything left wingers are saying currently.

Even more important is the positive way in which it recognizes the limitations of government legislation: "Mere legislative acts alone will not force capitalists to invest, employers to hire, or laborers to work". . . . "Impediments to prosperity in the near future are of the sort that must be worked out, without benefit of direct government intervention, through the practical wisdom of management and labor, farmers and financiers."

Here is a blueprint for national progress that makes sense. In fact, it is a concept that is almost directly opposed to the thinking of those who originally sponsored the Employment Act.

• • •

A NEW BATTLE CRY? Dr. Joseph L. Snider, professor of business economics at Harvard University, told members of the National Planning Association at Washington that guaranteed wages may become the battle cry of labor in this generation just as the 8-hour day was in the last.

This prediction has special significance for the iron and steel industry. It was leaders in iron and steel who, after presenting voluminous testimony to show that the long work-day could not be reduced, suddenly reversed themselves at the request of President Harding and acquiesced to the 8-hour day.

Today management in iron and steel is more realistically minded. Every employer knows that greater job security is desirable. Every employer also understands the difficulty of guaranteeing a specified amount of work in a year's time in an industry which is subject to wide fluctuations in the demand for its product.

For these reasons discussions on guaranteed wages, such as that by Dr. Snider and the interim report of OWMR prepared under the direction of

(OVER)

Murray W. Latimer, will be studied by employers with sincere and sympathetic interest.

One point stands out in these preliminary studies. Guaranteed wages are in competition with numerous laws, social security provisions and a host of other economic shock absorbers. There is a big job of co-ordination to be tackled before greater job security through wage guarantees can make notable headway. —pp. 37, 39

• • •

WAR ON COSTS AHEAD: Josh Billing's homely truism that "the wheel that squeaks the loudest is the one that gets the grease" may account in part for the fact that automobile manufacturers seem to be ahead of the procession in the metalworking industries in their zeal to cut production costs. Confronted with impressive deficits throughout most of the past year, motor car builders are moving heaven and earth to improve output per man and reduce indirect labor and overhead.

They have made considerable headway in the latter objective but progress in the former must await a period of sustained production at high levels, a more co-operative attitude on the part of employees and an opportunity to test the efficiency of postwar equipment, processes and organization.

The new year should usher in a concerted attack on all costs, in which companies thus far favored by profits will eagerly join those who have become cost-sensitive through the discipline of red ink. —p. 41

• • •

ANOTHER STEP FORWARD: Action by President Truman in consolidating most remaining wartime controls in a single agency and in lifting numerous restrictions on construction activities enables the nation to take another long step toward restoration of a relatively free, peacetime economy.

Obviously the full effect of these moves will not be apparent immediately, but after a few months of adjustment the forces of initiative and competition will come into play. Thereafter the results will be visible first in a marked increase in many lines of production and later in a leveling off of prices.

Within a short time after these improved conditions materialize, many persons will wonder why this nation permitted the left wing contingent in Washington to pursue its "mother knows best" program for so long a time after V-J Day. Credit is due the President for his decision—belated though it was—to break with the Wallace forces and for his promptness in ditching wartime controls after the November elections revealed the temper of the people. —p. 28

SIGNS OF THE TIMES: Changes in base prices and extensive revisions in extras are going into effect on a number of steel products. To a considerable degree the new schedules (p. 30) are the outcome of conferences between Steel Advisory Committees and OPA officials over a period of more than a year. They also conform more closely to present day conditions of production, specification and use. . . . A "snow eater" has been developed for railroads. Operated in connection with a locomotive (p. 64), it scoops snow from the tracks, melts it in a tank and discharges the resultant water. Melting is accomplished by plunging the snow into a tank of water heated to the boiling point by steam injection. The process may have application around industrial plants and yards. . . . In November non-agricultural employment rose to about 49 million for the first time. However, agricultural employment continued its seasonal decline, just about offsetting gains elsewhere. As a result total employment for the nation in November (p. 106) remained at 57 million. Estimated unemployment continues at about 2 million. . . . San Francisco Bay Area Council has outlined a four-point program for 1947 (p. 46), consisting of (1) industrial development through assistance in locating sites, (2) promotion of projects for improving transportation and shipping, (3) development of world trade through San Francisco bay ports and (4) development of a bay area master plan, involving industrial and residential zoning. . . . Unusual scope and flexibility of facilities for the radiographic examination of castings, forgings, parts and welds in steam turbines are features of the new radiographic laboratory at the South Philadelphia works of Westinghouse Electric. The equipment (p. 60) consists of a crane mounted 1000 kv x-ray machine, a mobile 200 kv x-ray unit and radium capsules. . . . Auto manufacturers have given no indication that they will halt or slow assembly lines for changing over to new models, inventory-taking or adjustment of inventory. Instead, the industry seems to be adjusting schedules so as to boom through to a rousing finish for 1946. Estimated output for last week was 98,000 units (p. 41) —a new postwar high.

Merry Christmas!

E. L. Shaner

EDITOR-IN-CHIEF

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Industry Discredits Nathan Wage Report

Contentions that wages can be advanced substantially without compensating price increases refuted. U. S. Chamber of Commerce terms report's conclusions a "mirage". CIO steel, automotive, electrical unions formulate new pay demands

CIO President Philip Murray, left, and Robert R. Nathan look over a report on "A National Wage Policy for 1947" prepared by Nathan for the CIO. At the CIO's behest, Nathan found industry could increase wages 25 per cent without advancing prices, a conclusion which was ridiculed by many industrial spokesmen

ORGANIZED labor's contentions that industrial wages can be increased without compensating price increases is drawing refutations from many sections of industrial management.

Cornerstone of the CIO's campaign for a new round of wage increases in the mass production industries—the Nathan report which purports to show that wage advances up to 25 per cent could be granted without offsetting price increases—has been examined critically and found wanting. To many, it is strongly reminiscent of the Department of Commerce "survey" released under similar circumstances late in 1945 and later repudiated after its fallacies had been demonstrated.

Meanwhile, the big CIO unions in the steel, automotive and electrical industries proceeded to draw the battle lines in the wage drive. The United Automobile Workers' leaders have announced they will ask a boost of 23.5 cents per hour in base wages and other concessions which will bring the total to around 30 cents an hour. The steel and electrical workers apparently intend not to reveal their exact wage demands until negotiations on new contracts are opened.

Industry comments on the Nathan report pointed to many fallacies contained therein. This report was prepared by Robert R. Nathan, former deputy director in the Office of War Mobilization & Reconversion, for the Congress of Industrial Organizations. It was presented to newsmen 10 days ago at a luncheon in Washington's Hotel Statler and was accorded considerable space in the newspapers, which at the same time pointed out many of the flaws in the report's conclusions.

CIO President Philip Murray said the Nathan report would be used as a guidepost in formulating future CIO wage demands.

The Chamber of Commerce of the United States in a formal statement termed the contentions contained in the report a "mirage." President William K. Jackson pointed out that after the first round of wage increases early this year prices went up despite the union's argument that wages could be raised 24 per cent without any price increase.

"The people of this country now know that this argument was not true," Mr. Jackson said. "And I am convinced that, this time, the public will be hesitant to swallow this new prediction based on the same reasoning that was used before."

"In spite of the elaborately fashioned report of the CIO-hired economist—recently in the government employ—labor officials must know that a second round of wage increases will compel closely corresponding price increases in the months ahead. Indeed, such increases may force both labor and goods out of the market."

Jackson pointed out that the country had not yet digested the complete effects of the first round of postwar wage increases.

"It takes varying periods, from a few days to many months, for the full effect of wage increases in steel, coal, transportation, etc., to be felt throughout all sectors of the national economy."

Jackson took exception to a statement made by Murray in which the latter called for "peaceful settlement" of the new wage demands and said that "it is up

to the industrialists whether a new wave of strikes is to be avoided."

"In other words," said Jackson, "unless management agrees to everything Mr. Murray demands, then management will be to blame for the strikes which Mr. Murray will call.

"It's just about as logical as though the highwayman said to his victim, 'if you don't hand over your money I'll have to shoot you—and it will be your fault.'"

Comments by other industrial leaders were in similar vein.

Walter B. Weisenburger, executive vice president of the National Association of Manufacturers, said the "theory that wages can be increased while prices are held at present levels. . . . is false."

C. E. Wilson, president of General Motors Corp., stated the situation bluntly: "If the workers gain a 25 per cent increase. . . . then prices of General Motors cars and trucks will go up 25 per cent."

George Romney, general manager of the Automobile Manufacturers Association, pointed out that companies manufacturing automobiles suffered an operating loss of $135 million for the first nine months of 1946.

"Single Entity" Fallacy Cited

Many observers pointed out that Nathan was guilty of a basic fallacy in treating all corporate business as a single entity. He failed to recognize that the profits position of the various segments of business vary widely and that the earnings of the food or liquor industry in one of the good years, for example, are not available to the steel, or automobile industry which may be losing money. A National City Bank of New York bulletin points out that the proportion of all active corporations operating at a profit in any one year between 1916 and 1946 averaged only 50 per cent. From this, the conclusion was drawn that any general wage increase must result either in a price increase or the elimination of the marginal concerns which provide a large share of employment.

It is the belief of many observers that the CIO leaders will attempt to win wage concessions early next year without resorting to strikes. Statements by Murray, Walter Reuther, head of the UAW, and other leaders indicate they will attempt to avoid long and expensive work stoppages.

There are many reasons why this may be so. CIO leaders have witnessed and possibly profited from the failure of John L. Lewis to force the government to yield to his demands by calling out the coal miners. They realize that as a result Lewis has suffered in prestige.

The CIO leaders also are keenly conscious that the new Congress will be getting under way at the time their wage demands are presented. Should strikes tie up the nation's factories at that time, laws severely restricting the unions are almost certain to follow and many of the privileges granted to the unions over recent years will be withdrawn.

Union leaders publicly are avowing their desire to avoid strikes. Philip Murray in announcing the wage-policy committee of the United Steelworkers last week had voted to ask substantial wage increases said: "We will go into negotiations with our cards on the table and hope that management will match our desire to settle matters peacefully without resorting to strikes."

At the same time, Murray said the steelworkers will file strikes notices as required by the Smith-Connally Act at least 30 days before present contracts expire on Feb. 15 "merely as a mechanical operation."

In addition to a "substantial" wage increase, the steelworkers will ask that all geographical differentials be abolished. Social insurance "covering old age retirement benefits, life, accident, health and other forms of group insurance, including medical care and hospitalization with the full cost incident to such to be borne through contributions by the company" is another major demand.

The wage-policy committee also approved advancing the guaranteed annual wage, portal-to-portal pay, premiums for work on Saturdays, Sundays and holidays, vacation benefits, adjustment of grievances and seniority rights as issues for bargaining.

The demands will be made not only on the primary steel producers but also on scores of metalworking companies which produce no steel but which have contracts with the steelworkers' union. Union officials said special consideration will be given fabricating companies.

DURABLE GOODS	Actual Sales	Expected Sales	Difference	% Actual Under Expected
Motor vehicle dealers	3.9	14.4	—10.5	73
Farm implements	.6	1.0	— .4	40
Household appliance, radio	1.1	1.5	— .4	27
Building materials	3.9	4.6	— .7	15
Furniture and furnishings	3.1	3.4	— .3	9

NONDURABLE GOODS	Actual Sales	Expected Sales	Difference	% Actual Over Expected
Dry goods, other general merchandise	1.4	1.1	+ .3	27
Drug stores	3.5	2.7	+ .8	30
General, including general merchandise with food	1.6	1.1	+ .5	45
Women's apparel and accessories	4.2	2.8	+ 1.4	50
Eating and drinking places	12.1	7.8	+ 4.3	55

REFLECTS STRIKES: Figures on the charts above, in billions of dollars, show the wide discrepancy between estimated and actual retail sales for the first half of 1946. Data are from a recent study by L. J. Paradiso, chief of the Department of Commerce Business Structure Division. The great lag in durable goods sales reflects the shortage of this type goods during the first six months, caused largely by strikes in the steel, coal, automotive and electrical industries. Buying power was thus diverted to nondurable goods which were in relatively more plentiful supply. Charts by NEA

President's Economic Advisers See Long Prosperity Possible

Council warns crippling strikes may cause recession in 1947 but insists many years of good times lie ahead if economic affairs are handled wisely. Believe situation does not warrant large public works programs or subsidies

NATIONAL prosperity in 1947 depends primarily upon labor and management getting together on wages without crippling strikes.

This was the essence of the first report by the President's Council of Economic Advisers, appointed last August under the Employment Act of 1946 to "tame the business cycle."

The council warned that after more than a year of peace the nation stands in a situation of "misunderstanding and tension among the indispensable parties to our total economic life."

Under these circumstances, the council sees possibility that mishandling of economic affairs could cause a minor recession next year. On the other hand, if affairs are handled wisely, a long period of good times should result.

"In spite of certain conditions that might make for a dip in 1947," the report says, "we believe that courageous and sensible action by those responsible for the administration of private business relations (including the labor unions) can at least hold such a recession to moderate proportions if not avert it.

Conditions for Prosperity Seen

"Thereafter, it would seem that broad basic conditions suggest that it will be easy to have some years of high production, employment and purchasing power without the display of any extraordinary economic statesmanship by leaders of industry, labor, farming and finance.

"In those years, however, we should not be satisfied with a level of production and conditions of use which fail to produce favorable results for all sections of the country and all segments of the population. In those years, also, if foresight is not keen and action vigorous, the stage will be set for serious unemployment, underproduction and want in the years that follow.

"It is our belief, however, that enough time is afforded in which wise policy and action on the part of labor, of management, of agriculture, and of finance, with a very carefully considered complementary role by government, will not only raise the national prosperity to new high levels but will maintain those levels with a degree of stability which has not characterized the earlier exploratory and speculative decades of our industrial life."

The major determinants, the council concludes, will be found in the statesmanship or obstinacy of the men, particularly the leaders, who play active parts in business operation.

"Mere legislative acts alone will not force capitalists to invest, employers to hire, or laborers to work."

The council believes 1947 does not present a situation "in which the government would undertake heroic measures of public works, consumer or producer subsidies to quicken employment or stimulate production.

Chairman of the council is Edwin G. Nourse, former vice president and director of economics for the Brookings Institution. Other members are Leon H. Keyserling, government housing official; and John D. Clark, former professor of economics and dean of business administration, University of Nebraska.

Present, Past and Pending

■ TURKISH RAILWAYS PLACE LOCOMOTIVE ORDER

NEW YORK—Announcement was made last week by Benjamin Dowd, president, Vulcan Iron Works, Wilkes Barre, Pa., that the Turkish State Railways had awarded a contract for 62 locomotives at a cost of more than $7 million. Before the war all Turkish State Railway locomotive requirements were supplied by European builders.

■ VACUUM CLEANER PRODUCTION SETS RECORD

CHICAGO—All records of the household vacuum cleaner industry were broken in November, making six months in succession during which sales have surpassed prewar marks, C. G. Frantz, secretary-treasurer, Vacuum Cleaner Manufacturers' Association, reported last week.

■ GM AUTO PRODUCTION HITS POSTWAR HIGH

DETROIT—New weekly postwar record in production of passenger automobiles by General Motors Corp. was achieved in the week ended Dec. 14, with 32,713 cars turned out, 720 more than the previous postwar high of 31,993 in the week ended Nov. 23.

■ GOODYEAR TESTING MODEL ALUMINUM HOUSES

AKRON—Three pilot model aluminum homes for testing purposes have been erected by the Goodyear Aircraft Corp. and application has been made for priorities to build some 250 more. The company has been studying the possibility of mass producing aluminum houses.

■ CONTINENTAL ORDNANCE PLANT SOLD BY WAA

CHICAGO—War Assets Administration last week announced sale of the government-owned Continental Ordnance plant, East Chicago, Ind., to General American Aerocoach Co. which plans to use it for building motor coaches.

■ NEW CHEMICAL PICKLING COMPANY ORGANIZED

BUFFALO—Formation of the Great Lakes Metal Processing Co. to manufacture a new chemical pickling process was announced here last week. James J. Earshen, inventor of the process, is president of the company.

■ CONSOLIDATED GETS OFFER FROM U.S. STEEL

LOS ANGELES—Stockholders of the Consolidated Steel Corp. Ltd. will consider at a special meeting an offer from Columbia Steel Co., U. S. Steel subsidiary, to acquire the company's assets and property. Columbia is understood to have made a cash offer of $8,293,319, subject to adjustments for any item of fixed assets acquired, or abandoned between Aug. 31, 1946, and the closing date of the sale. In addition Consolidated and subsidiaries would be paid for the value of inventory and work in process on the closing date.

■ HOLDS DOWN STEEL USE FOR FOREIGN CARS

WASHINGTON—To conserve steel for production of domestic freight cars, the Office of Temporary Controls last week ruled that no freight car builders shall place any order for steel to be used in production of freight cars for export unless it has written authorization from OTC to do so.

Truman Speeds Control Liquidation

Consolidates remaining war and reconversion agency functions in one bureau. Move is big step toward freeing the economy. Building curbs eased

THE NATION took a long step toward restoration of a free economy last week when President Truman consolidated most remaining wartime controls in one agency and ordered the lifting of many of the curbs on construction activities.

The President's action, generally, was interpreted as being in harmony with public sentiment as expressed in the November elections, and was viewed as giving promise of early liquidation of most remaining curbs on free enterprise which have stood in the way of rapid and smooth adjustment to peacetime operations.

In an executive order the President created the Office of Temporary Controls in which will be consolidated the Office of War Mobilization & Reconversion, the Office of Price Administration, the Civilian Production Administration, and the Office of Economic Stabilization. This new agency will be headed by Gen. Philip B. Fleming who also will continue as federal works administrator.

The new agency will be responsible for carrying out the continuing responsibilities of the OPA and the CPA, and certain activities of the OWMR. The priorities powers under which the CPA operates will expire Mar. 31, except for building materials, unless extended by Congress. The principal OPA programs which continue by law are sugar rationing and rent control. The functions of the Office of Economic Stabilization already have been largely terminated as the result of decontrol of prices and wages and elimination of most items from rationing.

The consolidation will result in economies in operation, and in more rapid liquidation of personnel, property, records, etc., which are no longer needed for current programs.

"Although the reconversion program has not been completed," said the President in his statement announcing the new agency, "The actions taken by this order in reducing the number of agencies involved in reconversion matters and the recent removal of price and wage controls materially lessen the need for continuing a separate OWMR. The statute under which OWMR operates expires June 30, 1947. Until that date most residual functions will be carried on by the Office of Temporary Controls. The OWMR Advisory Board will be continued for some time. Its members have expressed to me the desire to wind up their work and be relieved of their duties at the earliest practicable date."

The President's order also terminated the Wage Stabilization Board (as of Feb. 24, 1947) and the Economic Stabilization Board. It re-established the Office of Government Reports and transferred to it the functions of the Government Information Service of the Bureau of the Budget and the functions of the Advertising and Motion Picture Divisions of the OWMR.

The order also transferred the functions of the Office of Contract Settlement to the Treasury Department and disposed of certain other wartime functions, including certain functions of the Wage Stabilization Board which are transferred to the Department of Labor.

In his statement the President announced appointment of John R. Steelman as assistant to the President in which post he will aid in co-ordinating federal agency programs and policies. Mr. Steelman was director of the Office of War Mobilization & Reconversion. In his new post he will be assisted by a small staff and will continue to serve also as liaison between the executive agencies and the President's Commission on Higher Education, as well as serving as chairman of the President's Scientific Research Board which was established recently by executive order.

Most of the functions of the consolidated agencies were scheduled to terminate Mar. 31, when the second War Powers Act expires, unless extended by Congress. Actually, it is understood, the agencies had set that deadline for their demise prior to their consolidation.

The largest agency affected, the OPA, will have only about 16,000 employees left on Jan. 1. Its major remaining func-

Top men in the latest reshuffling of government control administrators are shown above. Left to right: Raymond M. Foley, National Housing Administrator; John R. Steelman, former head, Office of War Mobilization, and now assistant to the President; Maj. Gen. Philip Fleming, head, Office of Temporary Controls; and Frank Creedon, housing expediter

List of CPA Orders in Effect as of Dec. 12, 1946

(Orders marked ° were modified in December. Date in parentheses is that of last modification)

BUILDING MATERIALS DIVISION: °L-357—Restricts sale of certain plumbing and heating equipment to channel it into Veterans housing (Dec. 10, 1946);

CHEMICALS DIVISION: L-353—Limits deliveries and processing of cane alcohol; L-354—Limits production of lead chemicals; L-355—Limits consumption of ethyl fluid; M-54—Restricts delivery, use and consumption of molasses; M-131—Provides for allocation of cinchona bark and cinchona alkaloids; M-300—(Chemicals and Allied Products); Schedule 118 Controls distribution of penicillin; Schedule 119 Controls distribution of streptomycin; Schedule 120 Provides for allocation of potash; Schedule 121 Phenolic Resin;

CONSTRUCTION AND FIELD OPERATIONS BUREAU: VHP-1—Veterans' Housing Program, General restriction on construction and repairs; VHP-2—General restrictions on hardwood lumber; VHP-3—Use restrictions on cast iron soil pipe; VHP-4—Production restrictions on cast iron soil pipe;

EQUIPMENT DIVISION: L-352—Places quotas on exports of automobiles and trucks; L-356—Places quotas on exports of farm and track-laying type tractors;

FOREST PRODUCTS DIVISION: L-358—Permits builders of conventional-type houses to use up to 600 instead of 300 feet of softwood plywood per house in the fourth quarter of 1946; L-359—Limits sales of, and establishes set-asides for, various types of lumber;

MISCELLANEOUS MINERALS BRANCH: M-285—Restricts sales, purchases and deliveries of uranium and uranium compounds;

PRODUCTION SCHEDULING: M-293—Regulates placing and acceptance of orders for specified products and restricts their production and delivery;

RUBBER DIVISION: R-1—Controls sale and distribution of all natural and synthetic rubber except neoprene and establishes products specifications. °Appendix 1 Establishes permitted uses and products. Appendix 11 Manufacturing regulations;

IMPORTS DIVISION: M-63—Establishes list of strategic materials which cannot be imported except with permission of CPA;

STEEL BRANCH: M-21—Controls the production and distribution of iron products, steel forgings and other steel products and steel alloying products; explains identification of purchase orders. (Dec 6, 1946);

TEXTILE DIVISION: L-181—Men's Work Clothing; Limits design of overalls, dungarees, and various other kinds of men's work clothing to save material; L-224—Clothing for men and boys; Limits design of men's and boys' suits; specifically forbids vests in double-breasted suits, or second pairs of pants in any suits; M-84—Manila and Agave Fiber and Cordage; This order allocates the fiber to manufacturers for making certain cordage products most needed by the national economy; rope, binder and baler twine, and five other kinds of essential twine; M-317—Cotton Textile Distribution; parent order under which distribution of cotton fabrics and cotton sale yarn are controlled. Defines exports and requires statement of source of preference ratings; M-317A—Provides set asides by cotton mills of fabrics for exports and of types of twills customarily used for men's suits. Limits quantities of these fabrics subject to delivery on rated orders; M-328—Textiles, Clothing and Related Products; Provides for issuance of directions controlling production, fabrication, processing, or delivery of textiles, clothing, or related products; M-391—Rayon Fabrics; Requires set-asides of certain rayon fabrics for use as linings in feminine street wear for civilians. Deliveries may be made only to persons who certify they will use the fabrics for the desired end use. Limits the amount of fabric subject to certain preference ratings. Directions to this order also provide a set-aside and an incentive price production program for men's wear linings. (Dec. 4, 1946);

TIN LEAD AND ZINC BRANCH: M-38—Controls inventory, use, sales and delivery of lead; M-43—Prohibits use of tin in certain products; restricts use in specified products, restricts deliveries; allocates pig tin; M-81—Limits type of cans made of tinplate, temeplate or blackplate; M-112—Establishes allocation controls for antimony subject to specified exemptions; prohibits use in certain products;

UTILITIES BRANCH: U-2—Establishes preference sequence for telephone and installations; U-13—Provides for conservation of coal by manufactured gas producers and for orderly curtailment of service when and if necessary;

WHOLESALE AND RETAIL BRANCH: L-63—Limits suppliers' inventories; L-219—Limits merchants' inventories of consumers' goods;

PRIORITY REGULATIONS: PR-1—Basic Rules on Priorities; PR-3—How Preference Ratings are used; PR-5—Reproduction of Forms and Orders; PR-7—Standard Certification; PR-7A—Transfer of Quotas and Preference Ratings; PR-8—Filing of Reports; PR-12—Reratings; °PR-13—Special Sales (Excess and Surplus Stocks) (Dec. 6, 1946); PR-16—Appeals Procedure; PR-17—Post Exchanges; PR-22—Deliveries to Canada; PR-23—Experimental Models; °PR-28—Policy on CC Ratings (Dec. 3, 1946); PR-28A—Provides for priorities assistance in obtaining textile fabrics; °PR-32—Inventory controls (Dec. 12, 1946); °PR-33—Provides for priorities assistance in securing building materials for moderate-cost veterans' housing (Dec 13, 1946); PR-34—Controls RFC sales of certain surplus metals, minerals and other materials.

tions are the administration of rent controls, which expire June 30, unless extended, and rationing of sugar and rice, which will expire with the Second War Powers Act Mar. 31.

The CPA with 2600 employees, still has a substantial number of orders on its books covering allocation of scarce materials, inventory and import controls.

The OWMR and OES, which have performed largely policy-making and "umpiring" functions, have small staffs, most of which are transferred by the President's order to the White House.

Action of the President in easing controls on building had been anticipated ever since the recent resignation of Wilson Wyatt as veterans housing administrator and appointment of Frank Creedon as housing expediter, and Raymond M. Foley as administrator of the National Housing Agency. Mr. Wyatt had resigned both jobs in protest when President Truman declined to go along with him in effecting even tighter controls on building and building materials than Wyatt had at his disposal under the housing program.

Decision of the President to lift most of the curbs on construction followed a three-day conference with his economic advisers at which it was decided: 1—Anyone, veteran or nonveteran, may build a home for personal occupancy; 2—the former $10,000 ceiling on the sales price of a new house will no longer be in effect; 3—priorities for obtaining scarce materials will be scrapped; 4—the flat $80-a-month rental ceiling will be relaxed to the extent that a builder is permitted to rent his units at prices which average that amount; 5—$35 million a week limit on non-residential construction will be increased an unspecified amount.

It was not clear last week whether any plans were contemplated for keeping industry advisory bodies in existence after the various control functions are eliminated. In this connection in an interview on the day preceding his withdrawal as director of the Civilian Production Administration, J. D. Small had some good things to say about the industry advisory committees organized to serve the War Production Board during the war, and which have operated for CPA since.

The men comprising these committees have done and continue to do a remarkable job, declared Mr. Small. "The men selected are outstanding executives from business and industry and when they come to Washington they forget all selfish interests."

During the war many thousands of industrialists comprised the membership of advisory committees representing, at the peak, some 700 industries. In the months immediately following the war the number dwindled to around 100. Since then some of them have been revived, particularly in connection with the housing and premium payment programs; there now are some 200 of them.

Mr. Small hoped that some way would be found for keeping these committees in existence. "If all the industry advisory committees were to be revived and kept intact," he said, "it would be possible in 48 hours to mobilize industry to meet any future emergency."

This idea is being played with in a number of responsible quarters in Washington, in the new Office of Temporary Controls and the War and Navy Departments in particular. The stumbling block is: How are you going to keep a committee alive unless you give it a job to do? For most of the old industry advisory committees no peacetime tasks exist. The Army and Navy view is that they can meet peacetime problems with the help of special industry advisory committees, particularly those set up under the sponsorship of the Navy Industrial Association, the Army Ordnance Association and the Aircraft Industries Association.

Comprehensive Revision of Extra Cards Accompanies Price Changes

New schedules already have been issued by leading producing interests on important flat-rolled steel products and additional lists pend. Changes conform with proposals long under discussion with defunct OPA

PITTSBURGH

COMPREHENSIVE revision of extra cards is accompanying price adjustments currently being effected in the steel market. New schedules already have been published by leading producing interests on hot and cold-rolled sheets, hot-rolled strip, enameling sheets, galvanized sheets and long ternes, and new lists are being prepared for early issuance on additional products.

For the most part the changes in extras conform with schedules that had been under discussion for about two years between representatives of the steel industry and the now defunct Office of Price Administration. As a matter of fact, it is said OPA had agreed to the suggested lists but had not authorized their adoption up to the time of its demise.

Under the new schedule on hot-rolled sheets, the sharpest advances are on the heavier gages. For standard lengths in range of 24 to 48 in. wide the price for 12 gage sheets, including new gage, width and pickling extras, has been advanced to $3 per 100 pounds in carload quantities, increase of about $3 per ton. The gage and width extra has been raised 20 cents and pickling extra 5 cents for 12 gage sheets. No change in these extras has been made for 18 gage, which in effect limits the price increase for this gage to an advance of $1.50 per ton in base price. A new extra card is being prepared for 19 gage and lighter, and it is indicated some of the lighter gages will be priced higher than corresponding cold-rolled items.

There have been some slight revisions in length extras for odd lengths. Under the old price schedule no extra was charged for under 60 to 30 in. inclusive, but there is now an extra of 5 cents for 18 gage and heavier. The above prices are for standard lengths of 60 to 168 in. inclusive. From 168 to 192 in. there is an extra of 10 cents for 17 and 18 gage, over 192 to 240 in. inclusive the extra is 10 cents for 18 gage and heavier, beyond 240 in. the extra is 25 cents for 16 gage.

The order quantity extra for less than carload shipments under 7000 pounds has been increased from 25 to 50 cents per 100 pounds. In the old schedule 2000 pounds and over was considered base for item quantity extras; under 2000 to 1000 pounds the extra was 50 cents and under 1000 pounds, $1. For item quantity extras the base range is now under 10,000 to 6000 pounds; under 6000 to 4000 the extra is 20 cents; under 4000 to 2000, 50 cents; under 2000 to 1000, $1; and under 1000 pounds, $1.50 per 100 pounds.

A flat charge of 20 cents is now made for pickling, while quality extras have been established at 25 cents in contrast to previous method of basing these extras on gage of sheet. An extra of 25 cents is charged for special killed steel. For chemical requirement extras the maximum specified range shall determine the extra,

Hot-Rolled Carbon Steel Strip Price Differentials

Size, Gage and Width Extras per 100 Pounds

Thickness Ordering Limits, Inch.	.2030 to .1719	.1718 to .1570	.1569 to .1420	.1419 to .1271	.1270 to .1121	.1120 to .0972	.0971 to .0822	.0821 to .0710
3/8"----------	$1.60	$1.65	$1.75	$1.85	$2.10	$2.35	$2.65	$2.95
Over 3/8" to 7/16" inc.----	1.35	1.40	1.45	1.60	1.75	1.95	2.25	2.55
Over 7/16" to 1/2" inc.-----	1.20	1.25	1.35	1.50	1.65	1.85	2.15	2.45
Over 1/2" to 9/16" inc.----	1.05	1.10	1.15	1.20	1.25	1.30	1.80	1.90
Over 9/16" to 5/8" inc.----	.90	.95	1.00	1.05	1.10	1.15	1.40	1.50
Over 5/8" to 11/16" inc.---	.80	.85	.90	.95	1.00	1.05	1.10	1.20
Over 11/16"to 3/4" inc.----	.75	.80	.85	.90	.95	1.00	1.05	1.15
Over 3/4" to 13/16"inc.----	.70	.75	.80	.85	.90	.95	1.00	1.10
Over 13/16" to 7/8"inc.----	.65	.70	.75	.80	.85	.90	.95	1.00
Over 7/8" to 1" inc. ----	.55	.60	.65	.70	.75	.80	.85	.90
Over 1" to 1-3/8" inc. ----	.50	.55	.55	.60	.65	.70	.75	.80
Over 1-3/8" to 2" inc. ----	.45	.50	.50	.55	.60	.65	.70	.75
Over 2" to 3" inc. ----	.40	.45	.45	.50	.55	.60	.65	.70
Over 3" to 6" inc. ----	.30	.35	.35	.40	.45	.50	.55	.60
Over 6" to 12" inc. ----	.20	.25	.25	.25	.30	.35	.40	.45

Thickness Ordering Limits, Inch.	.0709 to .0636	.0635 to .0568	.0567 to .0509	.0508 to .0449	.0448 to .0389	.0388 to .0344	.0343 to .0314	.0313 to .0284	.0283 to .0255
3/8"----------	$3.25	$3.75	$	$	$	$	$	$	$
Over 3/8" to 7/16" inc.----	2.85	3.35	3.85	4.35					
Over 7/16" to 1/2" inc.----	2.75	3.05	3.35	3.65	4.15	4.65	5.15	5.65	
Over 1/2" to 9/16" inc.----	2.00	2.25	2.45	2.65	3.05	3.45	4.00	4.50	5.00
Over 9/16" to 5/8" inc.----	1.60	1.70	1.90	2.10	2.50	2.90	3.40	3.60	4.00
Over 5/8" to 11/16"inc.----	1.30	1.40	1.60	1.80	2.00	2.20	2.40	2.60	3.00
Over 11/16" to 3/4"inc.----	1.25	1.35	1.45	1.55	1.75	2.00	2.15	2.50	2.75
Over 3/4" to 13/16"inc.----	1.20	1.30	1.40	1.50	1.70	1.95	2.10	2.45	2.70
Over 13/16" to 7/8" inc.---	1.05	1.10	1.25	1.40	1.65	1.90	2.05	2.40	2.65
Over 7/8" to 1" inc.-------	.95	1.00	1.15	1.30	1.55	1.70	1.95	2.20	2.45
Over 1" to 1-3/8" inc.-----	.75	.90	1.05	1.20	1.45	1.65	1.70	1.90	2.00
Over 1-3/8" to 2" inc.-----	.80	.85	.95	1.10	1.35	1.55	1.60	1.80	1.90
Over 2" to 3" inc.---------	.85	.80	.90	1.05	1.25	1.45	1.55	1.70	1.80
Over 3"to 6" inc.----------	.65	.70	.85	1.00	1.15	1.35			
Over 6" to 12" inc.--------	.50	.60							

whereas the mean of the range was formerly used. The new carbon extras have been substantially increased and established on new basis. In carbon range of 26 to 40 per cent maximum for 0.1121-in. and thicker the extra is now 20 cents, in range over 40 to 60, 40 cents; over 60 to 100, 60 cents.

Principal price change in cold-rolled sheets is establishment of a new price base and extras to reflect modern produc-

(*Please turn to Page* 122)

Cold-Rolled Sheet Price Differentials

Size Extras, Gage and Width—Coils and Cut Lengths

Gage No.	Thickness Ordering Limits, Inches	Gage Weight Ordering Limits, Lbs. Per Sq. Ft.	Width in Inches														
			Over 12 to 23 13/16	Over 23 13/16 to 32	Over 32 to 36	Over 36 to 40	Over 40 to 44	Over 44 to 48	Over 48 to 52	Over 52 to 56	Over 56 to 60	Over 60 to 64	Over 64 to 68	Over 68 to 72	Over 72 to 78	Over 78 to 86	Over 86
6 & hvr.	.1869 & hvr.	7.813 & hvr.	.90	.80	.80	.80	.80	.80	.85	.85	.90	.95	1.00	1.05			
7	.1868—.1719	7.812—7.188	.80	.70	.70	.70	.70	.70	.75	.75	.80	.85	.90	.95			
8	.1718—.1570	7.187—6.563	.70	.60	.60	.60	.60	.60	.65	.65	.70	.75	.80	.85			
9	.1569—.1420	6.562—5.938	.60	.50	.50	.50	.50	.50	.55	.55	.60	.65	.70	.75			
10	.1419—.1271	5.937—5.313	.50	.40	.40	.40	.40	.40	.45	.45	.50	.55	.60	.65			
11	.1270—.1121	5.312—4.688	.40	.30	.30	.30	.30	.30	.35	.35	.40	.45	.50	.55			
12	.1120—.0972	4.687—4.063	.30	.20	.20	.20	.20	.20	.25	.25	.30	.35	.40	.45			
13	.0971—.0822	4.062—3.438	.20	.10	.10	.10	.10	.10	.15	.15	.20	.25	.30	.35			
14	.0821—.0710	3.437—2.969	.15	.05	.05	.05	.05	.05	.10	.10	.15	.20	.25	.30			
15	.0709—.0636	2.968—2.657	.10	Base	Base	Base	Base	Base	.05	.05	.05	.10	.15	.20			
16	.0635—.0568	2.656—2.375	.15	.05	.05	.05	.05	.05	.10	.10	.10	.15	.20	.30			
17	.0567—.0509	2.374—2.125	.20	.10	.10	.10	.10	.10	.15	.15	.15	.20	.30	.40	.50	.70	.90
18	.0508—.0449	2.124—1.875	.25	.15	.15	.15	.15	.15	.20	.20	.20	.25	.35	.45	.55	.90	1.10
19	.0448—.0389	1.874—1.625	.30	.20	.20	.20	.20	.20	.25	.25	.35	.40	.50	.60	.70	1.10	1.30
20	.0388—.0344	1.624—1.438	.35	.25	.25	.25	.25	.25	.35	.40	.45	.50	.60	.70	1.10	1.30	1.50
21	.0343—.0314	1.437—1.313	.40	.30	.30	.30	.35	.40	.55	.60	.75	1.00	1.25	1.40			
22	.0313—.0284	1.312—1.188	.45	.35	.35	.40	.45	.55	.65	.80	1.00						
23	.0283—.0255	1.187—1.063	.50	.45	.45	.60	.70	.80	1.05	1.20	1.50						
24	.0254—.0225	1.062— .938	.50	.50	.50	.60	.70	.80	1.25	1.55	1.85						
25	.0224—.0195	.937— .813	.55	.55	.60	.75	.90	1.20	1.65								
26	.0194—.0172	.812— .719	.60	.60	.70	.85	1.00	1.30									
27	.0171—.0157	.718— .657	.65	.65	.80	.95	1.10	1.40									
28	.0156—.0142	.656— .594	.70	.70	.95	1.05	1.35	1.75									
29	.0141—.0128	.593— .532			1.10	1.35	1.55										
30	.0127—.0113	.531— .469			1.25	1.55											

Hot-Rolled Sheet Price Differentials

Size Extras, Gage and Width—Coils and Cut Lengths

Gage No.	7 and Hvr.	8	9	10	11	12	13	14	15	16	17	18
Thickness Ordering Limits, Inches	.2030 to .1719	.1718 to .1570	.1569 to .1420	.1419 to .1271	.1270 to .1121	.1120 to .0972	.0971 to .0822	.0821 to .0710	.0709 to .0636	.0635 to .0568	.0567 to .0509	.0508 to .0449
Gage Weight Ordering Limits, Lb. Per Sq. Ft.	8.49 to 7.188	7.187 to 6.563	6.562 to 5.938	5.937 to 5.313	5.312 to 4.688	4.687 to 4.063	4.062 to 3.438	3.437 to 2.969	2.968 to 2.657	2.656 to 2.375	2.374 to 2.125	2.124 to 1.875
Width in Inches												
Over 6 to 10											.60	.75
Over 10 to 12											.55	.75
Over 12 to 15	.10	.15	.20	.25	.30	.30	.35	.40	.50	.50	.55	.65
Over 15 to 20	.10	.15	.20	.25	.30	.30	.35	.40	.45	.50	.55	.65
Over 20 to 23 15/16	.10	.15	.15	.20	.25	.30	.35	.40	.45	.50	.55	.65
Over 23 15/16 to 48	.10	.15	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60
Over 48 to 60	.20	.25	.30	.35	.40	.45	.50	.55	.55	.55	.60	.65
Over 60 to 64	.25	.30	.35	.40	.45	.50	.60	.65	.65	.65	.70	.75
Over 64 to 68	.25	.30	.35	.40	.45	.50	.60	.65	.65	.65	.80	.85
Over 68 to 72	.30	.35	.40	.45	.50	.55	.65	.70	.70	.70	.95	1.00
Over 72 to 78	.40	.45	.50	.55	.60	.65	.80	.85	.85	.85	1.05	1.10
Over 78 to 86	.40	.45	.50	.55	.60	.65	.85	.90	.90	.90	1.25	1.45
Over 86	.50	.55	.60	.65	.70	.75	.95	1.15	1.30	1.40	1.45	1.65

Machine Tool Builders Criticize WAA Surplus Disposal Policies

Only 25 per cent of available surplus machines and equipment sold. Lack of specific information on individual machines deterrent to sales. Twenty-two per cent of new tools going to foreign buyers, financed by UNRRA or International Bank

TELL BERNA, general manager, National Machine Tool Builders Association, who addressed the Cutting Tool Manufacturers Association in Detroit last week, said in a press interview that the surplus disposal policies of the War Assets Administration on war equipment are regarded with disfavor in the industry.

Present pricing arrangements, called fixed prices, are not that at all in reality, being rather cut prices. Only 25 per cent of available surplus machines and equipment have been sold and the lack of specific information on individual machines is a deterrent to sales.

Backlogs of machine tool builders have dropped to 6-7 months average, depending upon type of equipment, against a normal of 4-5 months. Total sales this year will be 50 per cent ahead of the best previous peacetime year.

About 22 per cent of all shipments are going abroad and have been financed either by UNRRA or loans from the International Bank.

Foreign buyers have proved to be very particular and want only the best, preferring machines with wide range of capacity, feeds and speeds.

$12 Million Recovered in Surplus Machinery Sales

Cleveland — War surplus machinery which cost the government $27,313,867 has been channeled into private industry by the Cleveland region of the War Assets Administration through approved machine tool dealers in 11 months of 1946 for a recovery value of $11,928,266. This represents 43 per cent of the original cost.

An estimated million dollars worth will be sold in December, boosting the year's total to a figure that will mark the Cleveland region as one of the leading outlets to industry for this type of surplus property.

More than 350 approved dealers in the Cleveland region act as sales representatives for the government in speeding the return of surplus machinery to peacetime manufacturing.

Millions of dollars worth of milling machinery, lathes, planers and other machine tools have been declared surplus by the Army, Navy and other agencies, and turned over to the WAA for disposal.

WAA officials regard the sale of these machine tools through approved dealers as a valuable adjunct to the government's disposal program, inasmuch as an established clientele is served with a resulting high rate of turnover. The government pays the dealer a commission of 12½ per cent, the estimated cost of moving such items when sold by regular salaried government personnel.

Labor, Material Uncertainties Holding Up New Orders

Cincinnati—Inquiries for machine tools are well maintained but the placing of new business is reported retarded by uncertainties in labor and materials. Threats from the coal strike to production were not fulfilled in this district, output thus far being unaffected.

Frederick V. Geier, president, Cincinnati Milling Machine Co., announced the company has acquired the British manufacturer of metalworking presses, Hordern, Mason & Edwards. The established name will be retained.

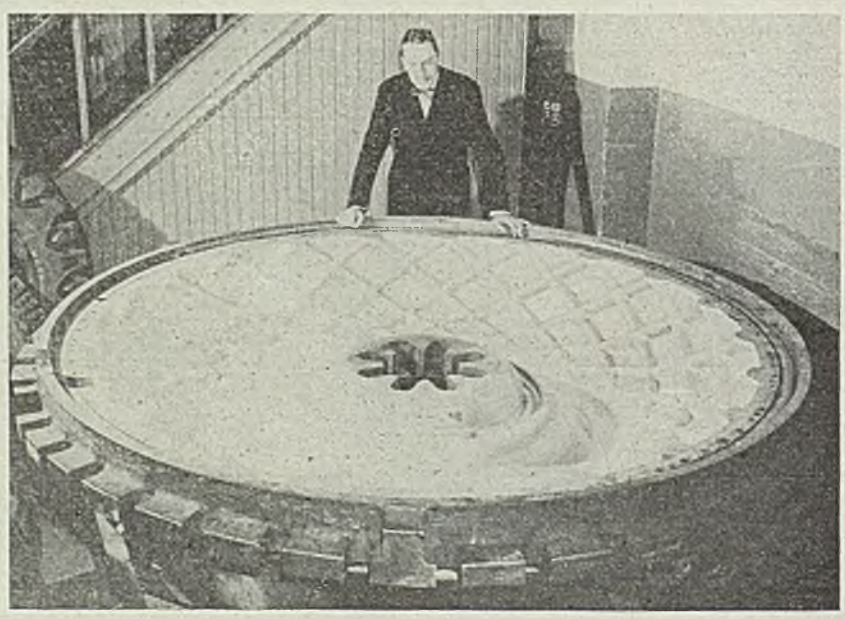
Massachusetts Machine Plant Offered by WAA

Fitchburg, Mass.—A surplus war plant here, with all machinery and equipment necessary for the production of machine tools, is being offered for sale or lease by War Assets Administration. The plant, formerly operated by the Fitchburg Engineering Corp, cost the government $558,000.

Allocation of More Surplus Steel to Warehouses Urged

Because the flow of steel mill products to small manufacturers is far below requirements, the Surplus Usable Steel Industry Advisory Committee recently made the following recommendations to the War Assets Administration: WAA procedures for disposal of surplus metals should be shortened so that surplus inventories may be made available more rapidly; CPA should allocate 50 per cent "across the board" of surplus metals for disposal to established steel warehouses.

W. H. Kelley, chief, Metal Sales Division, WAA, told committee members that he anticipated that 75 per cent of the present inventories of government-owned surplus steel and nonferrous products would become available within 60 days.



EARTHMOVER TIRE MOLD: Goodyear Tire & Rubber Co. is building the largest tire in its history, a 2085-lb unit for an earthmover. Shown here is the bottom half of the mold in which the tire will be cured. Examining the mold is W. E. Shively, manager of tire design for Goodyear

Steel Tonnages Being Offered At Fancy Prices

Unidentified broker offerings of flat-rolled products reported in Detroit at prices up to $250 per ton

DETROIT

DEVELOPMENT which suggests the serious out-of-balance position of supply and demand in the finished steel and scrap markets is reported here where a number of large steel buyers have been approached with offers of flat-rolled steel tonnages ranging up to several thousand tons at prices running up to $250 per ton.

The offers come from unknown brokers never previously associated with the steel business. The steel itself is believed to come from certain smaller warehouses which have engineered special trade deals involving scrap-for-steel with steel mills frantic for scrap.

The arrangement works about as follows. . . . The warehouse will offer the steel mill five or six tons of scrap for one ton of sheet steel. Then, if the offer is accepted, the entrepreneur will approach scrap dealers and offer $5 a ton over the current market on open-hearth grades of scrap. He can afford to do this because he simply turns around and sells the finished steel for well over the the published price to make up his loss on the scrap and return a handsome profit besides.

Trade Affecting Scrap Market

The technique is interesting, but causes serious disturbance to an already chaotic scrap market, since most dealers and brokers have been going along with the price on scrap at $5 per ton over the former OPA ceiling.

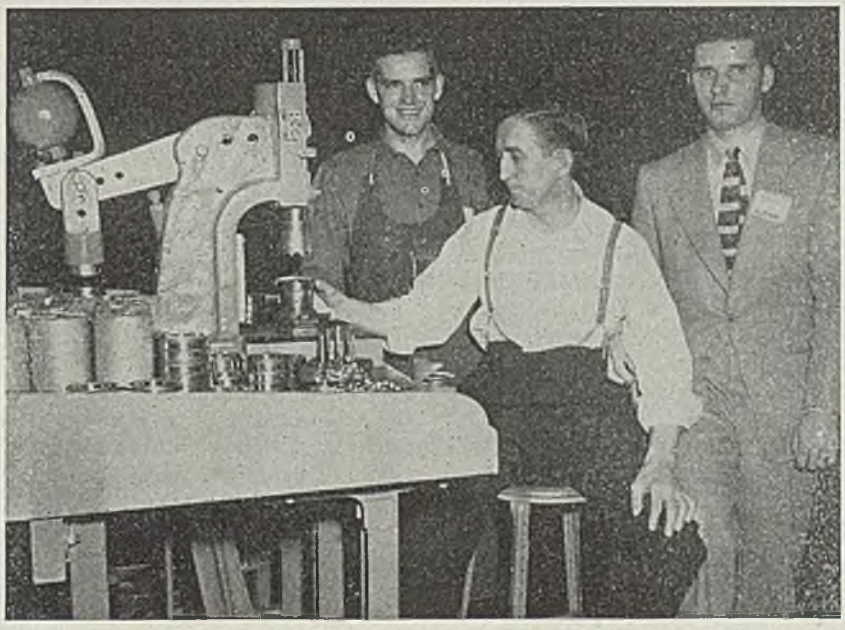
While many scrap dealers in Detroit acknowledge the fact such trading is going on, it is impossible to pin down specific cases or to name names. However, two cases are cited of steel tonnage offered at premium price. One involved 250 tons of 13-gage sheet at $180 per ton, the second a substantial tonnage of 20-gage material at $250 per ton.

The situation basically develops from shortage of scrap. Dealers in Detroit who normally shipped most of their tonnage to the local mill are now sending material under special instructions to locations they never heard of before. Part of this, of course, results from channeling instructions from scrap sources which, under pressure from steel suppliers, are returning scrap to the mill from which steel is received; part of it doubtless is the result of "deals" outlined previously.

Fisher Body Division, General Motors, last week sold 2500 tons of brand new dies, originally produced for 1948 model passenger cars in the Chevrolet-Oldsmobile-Pontiac group, and scrapped as a result of cancellation by GM of one phase of its 1948 program. The dies ranged from 50 to 50,000 pounds in weight and brought an average of around $32 per ton in the form of heavy breakable cast.

The situation in the market is not peculiar to the Detroit area alone. For example, last week a large steel buyer in another district is understood to have turned down an offer of forging quality billets at $55. The offer was made by individuals who apparently had been able to get their hands on a quantity of material.

It was also reported in the market that buyers have been approached by individuals with offers of cold-rolled bars at prices up to $200 per ton, shapes up to $140 per ton and hot-rolled bars at $150 per ton. In no case has any of these offers been made by steel producers or reputable, long-established brokerage interests.



NAM HONORS VETS: These three disabled veterans, all of whom are doing good work in industrial plants, were honored guests at the recent annual convention of the National Association of Manufacturers in New York. Left to right are: Sodoy T. Steigerwald, Reading, Pa., Joe Dobek, New Britain, Conn., and John Bitunjac, Chicago. NEA photo

Sheet and Strip Steel Shipments Set New All-time High Record During October

SHIPMENTS of hot and cold-rolled sheet and strip steel during October 1946 were at all-time high levels, according to the American Iron & Steel Institute.

Reflecting operation of some new facilities, October shipments totaled 1,450,196 tons, topping any previous wartime or peacetime month. Allowing for the greater number of working days in October, production of these items during that period was at an annual rate of 16,956,000 tons.

In 1941, when many records were set in the production of consumer durable goods, only 14,570,000 tons of sheet and strip steel were shipped by the industry. Thus, the October production rate of sheet and strip steel on an annual basis would be about 16 per cent greater than the figure for 1941.

Actual tonnages of these products shipped in October include 700,107 net tons of hot-rolled strip and 133,332 net tons of cold-rolled strip, the institute reported.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

New survey of the iron and steel industry is projected by the Department of Commerce. Basic program calls for listing all producing facilities, capacity by individual products and location. Suggestions from industry welcomed

COMMERCE Department officials will meet soon with representatives of the American Iron & Steel Institute to discuss plans for a new survey of the iron and steel industry.

The basic intention is to prepare a list of all iron and steel producing facilities and describe their equipment and their capacity by individual products, and state their locations.

But this original concept can be expanded if enough people in industry so desire. Commerce Department is even willing to consider proposals, should they be made, to trace iron and steel shipments from producing plants and classify the tonnage by end products, geographical distribution, or by the extent to which they enter into employment in the many affected industries and activities.

This will be the second such survey undertaken by the Commerce Department. The first of these surveys was made for the Defense Plant Corp. for guidance in carrying out the wartime iron and steel expansion program. The report to the DPC never was made public. Later that report was revised for the Senate Small Business Committee, and it was released by that committee to the public in 1945. Since then, in response to questions and suggestions by certain automobile makers and other industrialists, commerce officials have decided to undertake a survey that will cover much more ground than that conducted for the DPC and the Senate Small Business Committee.

The new survey will be under the general direction of H. B. McCoy, director of the Office of Domestic Commerce, George W. Muller, chief of the Industry Division of the Office of Domestic Commerce, and Robert M. Weidenhammer, head of the Machinery & Metals Section, Industry Division. These men are eager to receive any suggestions aimed at making the survey results fully effective.

Talk Proves Unavailing

There used to be a belief among many Washington officials that the way to get industrial peace was to get the employers and the union leaders into one room and let them talk over their problems and exchange viewpoints. Now they are a little skeptical for although there have been a good many attempts to promote harmony by getting the opposing sides together the results have not been satisfactory.

A good example was the President's labor-management conference in November of 1945. President Truman and his advisers expected big things from this conference. While they did get agreements covering a great many points that were raised, the conference adjourned without settling the really controversial questions. Union delegates blamed some of the employers who were present during the conference. And the situation was not helped any by differences between the rival union leaders. Thus nothing was done to forestall and prevent the costly strikes of 1946.

Another example of a failure of this kind has been chalked up following a conference between employers and unions in the utilities field. The meeting was called by Edgar L. Warren, director of the U. S. Conciliation Service following the power strike which so badly crippled economic life in the Pittsburgh area recently. Mr. Warren thought that if the utility managers and the union leaders got together they probably would come up with a plan for preventing a repetition of such disturbances. Mr. Warren told the meeting that almost all utilities' labor contracts contain adequate clauses for arbitrating grievances arising during the life of the contract.

Negotiation Held as Important

"The utility problem," he said, "lies chiefly in the negotiation of new contracts. Can we develop out of this group the basis for a program that will assure industrial peace in the utility field?"

All that Mr. Warren obtained, following a long day of discussion, was the following statement:

"Both management and labor in the utility industries have a basic responsibility to the citizens of the communities which they serve. The representatives of industry and labor who have been meeting recognize that this responsibility requires every effort on their part to maintain industrial peace. These discussions will be continued in separate industry groups. It is expected that this joint conference will be reconvened later."

The expectation that the conference will be reconvened at a later date is not especially encouraging for it is customary, when adjourning such meetings, to look forward to subsequent meetings.

COMMITTEE ON COMMITTEES: These Republican leaders of the new Congress are attempting to straighten out assignments to committees and chairmanships before the new session starts. Left to right, seated: Sen. Robert A. Taft, Ohio; Sen. Wallace H. White, Maine; Sen. C. Wayland Brooks, Illinois. Standing: Sen. Raymond E. Willis, Indiana; Sen. Hugh Butler, Nebraska; Sen. Edward Robertson, Wyoming. NEA photo

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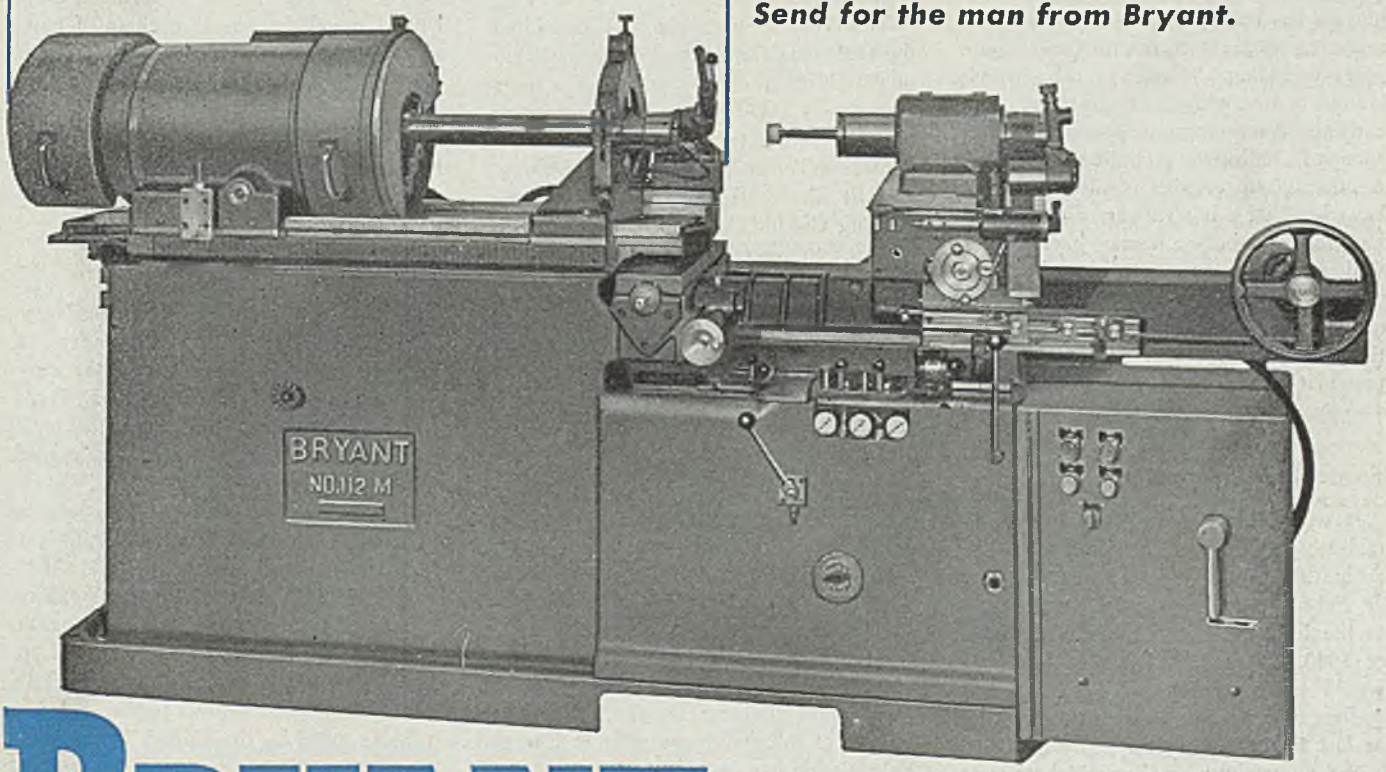

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Actually, however, both sides realize that they said their say on the initial occasion, and the subsequent meetings seldom materialize.

Wage Experts Available

Many of the men who handle labor relations for private firms and corporations received their basic training from the government. Working in the agencies which at one time or another have had to do with labor and labor-management problems, they gathered experience which since has been put to use in private industry. In particular, their experience with the government gave them an understanding of the psychology of union leaders, so that in their present jobs many of them have helped to smooth the relations between employers and workers' unions.

Now another batch of experienced people is about to become available for employment in private industry. This comprises some 150 people who have the "know-how" in the Wage Stabilization Board. They will be available between now and Feb. 24, which has been set by the President as the expiration date for the WSB. Private firms and corporations can ascertain their qualifications by writing to the Wage Stabilization Board, Washington 25, D. C., or inquiring at any of the WSB regional offices throughout the country.

One substantial group of these employees has had specialized experience in analyzing wage structures, for various purposes including detection of rates which are out of line with the wage structure as a whole. Another group has had experience as "industrial relations advisers." Another group consists of attorneys who have handled a big variety of cases calling for a labor-economic background. Still another group has specialized in making job studies, and personnel studies of various kinds. Finally, a number of these people have had an all-round experience due to performing supervisory assignments in the WSB.

Fantastic Proposal

It would be a most illogical and unrealistic procedure for the football authorities to get together next January or February and agree to amendments to the football rules for, say, the season of 1945. The validity of the old scores would be wiped out and there would endless argument as to which teams won or lost important games.

Yet, a comparable policy which appears to be just as fantastic and incredible was adopted by the OPA enforcement division which has been headed by Deputy Administrator William E. Remy. By this ruling, OPA reserves the right to go back over price and rationing regulations which now are defunct, and amend them retroactively for enforcement purposes. Capital city lawyers, after pinching themselves to make sure they are not dreaming, wonder whether the OPA actually intends to call business firms to account for violating rules which were not in effect at the time.

The answer to this question is not now fully available. A check by STEEL evoked the explanation that the ruling is intending merely to safeguard the OPA enforcement program. The Price Control Act as amended in 1946, though fixing June 30, 1947, as the OPA expiration date, specifically extended the power of enforcement. An OPA spokesman told STEEL that no amendments of now defunct regulations are planned, and possibly none will be made; the ruling was put on the record to provide ways and means for taking care of "inequities" that may arise in connection with the prosecution of old enforcement cases.

No fewer than 40,000 business firms and corporations are directly interested in this ruling. This includes some 20,000 against whom OPA enforcement suits now are pending in the courts, and some 20,000 whose alleged violations of OPA regulations now are under investigation.

Ordnance Research Pushed

The War Department has permitted the Ordnance Department to proceed immediately on the construction of a number of new buildings to house important research and development units. These include a Terminal Ballistics Laboratory, to cost about $1,000,000, at Aberdeen Proving Ground, Md.; guided missile facilities, to cost about $1,000,000, at White Sands Proving Ground, N. M.; a supersonic wind tunnel and shop and test facilities, to cost $2,934,000, at the California Institute of Technology; plant for production of propellant fuels for jet planes, to cost $500,000, at Picatinny Arsenal, N. J.

Manhattan Project Transfer

Though the War Department takes great pride in the fact development of the atom bomb, and today's understanding of the atomic energy field, have resulted largely from the work of its Manhattan Engineer District, there is a feeling of relief the new Atomic Energy Commission has decided to take over the Manhattan Engineer District Jan. 1, 1947.

During the war the Manhattan Engineer felt it necessary to go to unusual lengths to keep intact the veil of secrecy thrown around atomic research and many scientists associated with the project complained about the manner in which they were "muzzled." Under the civilian United States Atomic Energy Commission, headed by David Lilienthal, there can be no suspicion of surveillance by the military.

Also, War Department officials are glad to be relieved of the reiterated charge that under their supervision the military viewpoint would receive too much emphasis in future atomic research.

Transfer of the Manhattan district will represent a clean sweep. It will involve all personnel, funds and properties, and the War Department will be relieved completely from the status of temporary custody arranged in October. Beginning on Jan. 1, or as soon thereafter as final details can be arranged, all War Department responsibility will end. Even Major General L. R. Groves, commanding general of the Manhattan Project, will serve only in a consulting capacity thereafter.

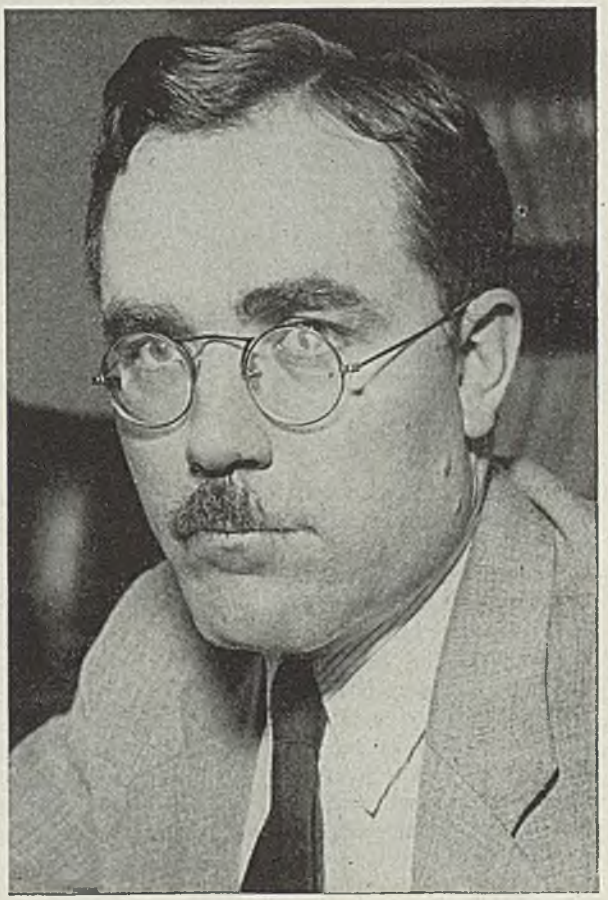
One of the final activities of the Manhattan Project, incidentally, was the award to Hydrocarbon Research Inc., 115 Broadway, New York, on Dec. 10, for engineering services in connection with construction of the Brookhaven National Laboratory, Patchogue, New York. To be built on the site of former Camp Upton, it will be one of a chain of government-sponsored and financed atomic research laboratories. It will be operated for the Atomic Energy Commission by Associated Universities Inc., an agency formed by nine major eastern universities.

Navy Lecture Program

Among lecturers selected by the Navy Industrial Association to read papers at the Naval Gun Factory during the current season are the following: A. E. Proctor, Ford Motor Co., on "Shot Peening." Dr. Eugene Lieber, Nox-Rust Chemical Corp., on "Corrosion Prevention." Earle Buckingham, professor, Massachusetts Institute of Technology, on "Worm Gear Design." F. E. Birtch, Cone-Drive Division, Michigan Tool Co., on "Producing Cone Drives." Macon Fry, Maxson Engineering Division, W. L. Maxson Corp., on "Computing Mechanisms." The schedule provides for a speaker to be supplied by the United States Rubber Co. on "Precision Metal Parts Produced by Electro Forming" and another by SKF Industries Inc. on "Selection of Ball and Roller Bearings to Suit Applications."

OWMR Study Cites Benefits Of Guaranteed Wage Plans; Comparatively Few Dropped

Latimer report cites improved labor relations, lower turnover, increased efficiency and higher labor productivity as results of programs. Recommends plans should be co-ordinated with unemployment insurance laws



MURRAY W. LATIMER

GUARANTEED annual wage plans result in improved labor relations, lower labor turnover, and make for a more efficient labor force and raise labor productivity. Often such plans achieve economies for employers.

These contentions are contained in the interim report on the guaranteed annual wage study made by the Office of War Mobilization & Reconversion under the direction of Murray W. Latimer, former chairman of the Railroad Retirement Board.

Because of the advantages cited, says Mr. Latimer, employers who have adopted guaranteed annual wage plans usually retain them.

"Plans numbering 196 were known to be in operation early in 1946; there are doubtless many more," says Mr. Latimer. "The mortality of plans has not been high; the 196 plans were the remainder of 258 normally adopted plans. Of the 62 discontinued plans, the withdrawal of 40 per cent came after 1941, and the lapse of an almost equal portion came with the beginning of unemployment insurance benefits. The plans seem on the whole to have been remarkably impervious to depressions."

Guarantees under most of the plans in operation are not niggardly.

Majority Guarantee Full Pay

"In almost 95 per cent the guarantee covers full pay for the guarantee period. In 65 per cent such full pay runs for 12 months, and in another 18 per cent for 10 or 11 months. About 67 per cent of the plans cover all employees or all regular employees immediately on hiring or within 30 days or less. Over 42 per cent of the plans guarantee to all, or all regular employees after not more than 30 days' service, full wages for 10 months in the year or longer; almost 33 per cent pay full wages for the full 12 months.

"Existing plans attest the practicability of considering substantial guarantees of earnings for substantially all employees.

"Guaranteed wages, as any other wages, can be paid only if there is a product from which to make the payment," according to the report of Mr. Latimer. "Measures that would regularize production, to the extent that they may be practically introduced, will serve to increase the ability of the employer to stabilize his employment. Many employers have found practicable means of reducing the variability of output and the difference between employment volumes at different times of the year and, in fewer cases, at different times of the cycle."

As a result of studies in six establishments, the costs of guaranteed wage systems were found to vary widely. But they showed that even in establishments liable to a high degree of employment instability, the costs can be held to less than 6 per cent a year.

Some of the existing laws do not encourage the adoption of wage guarantee plans and should be modified, says Mr. Latimer. The unemployment insurance arrangements at present are unfair to the employer who guarantees wages.

"Although the tax provisions of the Social Security Act (now in the Internal Revenue Code) permit state laws to reduce the unemployment contribution rates of employers who offer certain minimum wage guarantees to employees, neither states nor employers have indicated any interest in taking advantage of the permission," says the report.

"The payment of a guaranteed wage by an employer to an employee for whom he can find no work substantially prevents receipt by that employment fund of making benefit payments for which it would otherwise be obligated.

"As a consequence, an employer who guarantees wages is, in effect, required to pay contributions on the same basis as any other employer in the state, apart from perhaps a slight advantage because of keeping some employees off the unemployment insurance rolls; on the other hand, the employer must pay for the whole of whatever the guarantee is, even when he is unable to find work for the employee to do and when, without the guarantee, the employee would draw unemployment benefits.

"If an employer could put his guarantee in such form that he could pay to an employee for whom he cannot find employment, the difference between unemployment benefits and the amount of the guarantee, the costs of a guarantee of 100 per cent of wages would be reduced by from 35 to 50 per cent, for unemployment lasting from 15 to 20 weeks (in some states to 26 weeks). The cost under a guarantee of 80 per cent of wages for unemployment of like duration would be reduced by from 44 to 62 per cent. If unemployment laws were extended to reasonable limits in both benefits and durations the suggested integration of unemployment benefits and guaranteed wages could save 60 to 70 per cent of the employer's cost for guarantees of full wages, where the unemployment is of brief duration and from 30 to 35 per cent of cost where the guarantee must be met, without work by the employee, for a full year.

"Integration on the basis just described would require amendment to most state laws. The foregoing contemplates no change in any provision of state laws

except the status, as wages, of payments under a guaranteed wage plan.

"It is recommended: That the board record itself as in favor of amendments to state unemployment compensation laws which would:

"(a) permit an employee who receives a guaranteed wage payment with respect to a period in which no work is found for him to receive unemployment benefits under the appropriate state law and the balance of his guaranteed wage from his employer;

"(b) fix appropriate standards for approving guaranteed wage plans for benefit paying purposes;

"(c) continue the present status of guaranteed wages as wages for all purposes except the definition of unemployment; and

"(d) make appropriate provision for employer reporting."

Mr. Latimer presents as follows his views about the feasibility and desirability of increasing unemployment compensation benefits to idle workers:

"All unemployment insurance systems," he says, "have accumulated huge reserves—reserves sufficient to pay benefits for the maximum duration to a large percentage of all covered workers. The possibility that any such reserves will be required is extremely remote. Using the profits of the federal government in unemployment insurance operations as a reinsurance pool, as is contemplated in the War Mobilization & Reconversion Act of 1944, would insure any fund against insolvency, even with benefits substantially higher and payable for longer periods than at present.

Increased Benefits Possible

"Practical limits on benefits will probably be 65 to 70 per cent of pay, to a maximum of $25 to $30 per week, and with a duration of 26 weeks to 30 weeks. On this basis, compared with full-time wages as 100 per cent, unemployment insurance benefits could cover 62 to 67 per cent of the wage losses in unemployment lasting 26 weeks (assuming a one-week waiting period); 56 to 68 per cent of wage losses for unemployment of 30 weeks; 42 to 53 per cent of wage losses for unemployment running for 40 weeks; and 33 to 40 per cent of wage losses for unemployment running for a year."

Mr. Latimer recommends certain changes in the income tax law and explains his purpose as follows:

"For every extra dollar currently paid out in wages under a guarantee, a company with a taxable income of $50,000 or over has its tax reduced by 38 cents. Moreover, so long as the company has any profits over the five-year period covered by the carry-back, carry-forward provision of the law, the government will bear part of the guarantee cost through reduction in taxes even if there are no taxable profits in the particular year in which payments were made. From the standpoint of government revenue, the net cost is not the full amount of the reduction in the corporate income tax, since the employee receiving the additional payment will normally be subject to an income tax.

"It seems clear that under existing law if an employer had funds from current income which he wished to set aside for the payment of possible future guaranteed wage costs, there would be available for that use a net on only $68 out of each $100 available before taxes (assuming a corporation with an income of over $50,000). The federal income tax laws now permit the classification, as an allowable expense, of contributions by an employer to trust funds created for the support of pension, stock bonus and profit sharing plans, the cost of purchasing annuities for employees under reinsured retirement annuity plans, and perhaps certain other payments of similar character. In order to be an allowable expense, no part of the contribution may, under any circumstances, revert to the corporation in the future.

"Whether this is a practicable provision for a guaranteed wage trust fund is not yet clear. It is open to question whether future costs of guaranteed wage plans may be estimated with a degree of accuracy sufficient to satisfy the accounting requirements of the Treasury. It is clearly desirable to find ways to surmount these difficulties in order to be able to formulate legislation which would meet reasonably the precedents which have been established with respect to employer contributions to employee benefit funds. The major problems connected with tax exemption relate to the standards to be applied as a condition of granting the exemptions.

"It is recommended that the board give consideration to recommending amendments to the income tax laws so that reasonable employer contributions to an employee trust connected with a guaranteed wage plan may be allowed as a cost of doing business, provided that some standards of reasonableness of the size of contributions can be found and that some device for safeguarding the integrity of the trust without penalizing the successful employer can be found."

Another law needs revision in order to encourage more general adoption of wage guarantee plans, says Mr. Latimer. That is the Fair Labor Standards Act; the intent of Section 7 (b) (2) to promote the wider adoption of guaranteed wage plans has not been accomplished. Although the matter continues under study, some reasons for this failure seem clear.

"First, the provision is highly inflexible. There is a fixed limit, 2080 hours,

CONGRATULATED: William Chapman Foster, right, of Scarsdale, N. Y., new undersecretary of commerce, is pictured receiving congratulations from W. Averell Harriman, secretary of commerce. Mr. Foster succeeds Alfred E. Schindler, who resigned to return to private business in St. Louis. NEA photo

in the time which may be worked within a year; and if the time worked exceeds the limit by one hour the employer must recalculate all payments for time in excess of 40 hours per week made since the beginning of the guarantee year.

"Second, employers and employees are unable to find out in advance whether a specific plan meets the requirements laid down in the act.

"Third, uncertainty exists as to what is the minimum guarantee required in the case of hourly rated workers.

"It is recommended that the board go on record as favoring:

"a—The amendment of the Fair Labor Standards Act to replace the 2080 limitation on hours under Section 7(b) (2) by a limitation of not more than 2080 hours; provided that after 2080 hours have been worked in any year, each additional regular hour be compensated at time and one-half and that each additional overtime hour be compensated at double time;

"b—Authorizing the Wage and Hour Administration, upon proper application, to certify a plan as complying with the legal requirements;

"c—Permitting the fixing of standards of full-time hours at less than 40 per week and 2080 per year but not less than 1768; and

"d—Limiting work for which no overtime is paid to 50 or 53 hours rather than 56 hours as at present."

AFA Committee To Study Foundry Coke Behavior

Cupola Research Committee of the American Foundrymen's Association is embarking on an intensive study of foundry coke quality and behavior, according to R. G. McElwee, Vanadium Corp. of America, Detroit, committee chairman.

As the first step in the study, a basis of correlating coke properties with actual operating experience by analysis of data to be acquired under actual melting conditions in co-operating foundries will be sought. Field studies will be supplemented by laboratory investigations.

As nearly as practical, data developed by the project will be issued in quarterly reports and, after committee review, will be the basis for further studies.

Members of the committee, in addition to Mr. McElwee, are: A. L. Boegehold, General Motors' research laboratories, Detroit; E. H. Stilwill, Chrysler Corp., Dodge Division, Detroit; H. Bornstein, Deere & Co., Moline, Ill.; E. C. Jeter, Ford Motor Co., Dearborn, Mich.; and A. E. Schuh, U. S. Pipe & Foundry Co., Burlington, N. J.

Warns Guaranteed Wage May Be Labor's Battle Cry of Generation

Harvard professor finds regularity of work and wage is primary concern of industrial labor. Tells labor unreasonable demands are self-defeating. Advocates joint approach to problem by management and workers

REGULARITY of work and wages has become the primary concern of workers in industry. Guaranteed wages may become the battle cry of labor in this generation, as the 8-hour day was in the last.

This warning was voiced before the National Planning Association in Washington recently by Dr. Joseph L. Snider, professor of business economics at Harvard University, and author of a study, "The Guarantee of Work and Wages," to be published in February.

Some conclusions from his study were outlined to the NPA meeting as follows:

"The 'guaranteed annual wage' is the popular term employed in current discussions. The term, however, means different things to different people. Unionists frequently use the term to mean a full year's wage to every employee in a plant or an industry. In this extreme form, the annual wage issue is not realistic. Except in extremely stable industries, a full year's pay to all the workers cannot be guaranteed at present.

"To others, the guaranteed annual wage means an assurance of a definite amount of work during the year, the amount being less than a normal year's work. To the speaker, the guaranteed annual wage means either an announced policy of an employer or an agreement by an employer with a labor union, providing for a stipulated amount of work or wages during the year, to a stipulated portion of the workers. There is no legal compulsion behind the guarantee, nor is there a pledging of assets in support of the guarantee, although the company may set up a reserve for it.

"The managers of American business in general will find, after an examination of the evidence, that they could easily provide a considerable degree of employment security. It is important for each company to ascertain just how much security it can afford to provide.

"Experience with annual wage plans shows that, with some exceptions, workers have responded so favorably to the additional security inherent in the plan that management has become convinced that the company as a whole has profited.

"Inasmuch as pressure from labor is the most dynamic element in the movement for employment security, it is particularly important that labor pressure be intelligently planned and effectively applied. In the first place, unions should study the problem of employment security and guaranteed wages much more thoroughly than they have yet done.

"A study made jointly by management and labor in a company or industry has much to be said for it. Neither side should shrink from a joint approach to the problem.

"Labor should not make demands for unreasonable guarantees of work and wages. Unreasonable demands are self-defeating and mar the relations between management and labor, and, in turn, tend to aggravate insecurity.

"More important than exactly how much of a guarantee an employer might be high-pressured into granting is getting him to grant a guarantee at all.

"Labor can assist management in increasing the stability of employment apart from increasing the stability of business. In this connection one of the most significant things labor could do would be to provide for a greater degree of flexibility of transfer of individual workers among different jobs. This measure involves both the willingness and the ability to perform other types of work, which are still in demand, when the demand for the worker's primary skill has fallen temporarily.

"Even if industry should provide the full degree of wage security which is practicable, there would still be millions of workers without satisfactory security. A necessary condition of the extension of wage security is further stabilization of business operations and economic conditions generally."

Magnesium Exhibit To Be Staged at Wright Field

Army and Navy designing and engineering personnel have been invited to Wright Field, Dayton, O., Feb. 4 to 6, to attend a magnesium exhibit, sponsored jointly by the Army Air Forces and the Magnesium Association.

More than 40,000 square feet of floor space at the field has been set aside for the exhibit, which will include both industrial and military applications of the light metal.

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

Mirrors of Motordom

Passenger car assembly lines show no sign of slowing for change-over to 1947 models and inventory tabulations. Industry apprehensive over costs as United Automobile Workers start campaign for new wage increases

DETROIT

EARLIER this year, reports were heard of plans being drawn by automobile companies to shut down passenger car lines in December, either to permit brief changes in processing equipment to handle 1947 models or to effect tabulation of inventories and perhaps a better balancing of inventories. As of last week, such closings had not developed, the industry apparently revising its schedules to boom through to a rousing finish for 1946. One possible explanation is that General Motors divisions did not complete their projected schedules by the first week of the month, and will keep going until these schedules are finished, which in some cases may be after the first of the year.

The GM units have been maintaining a consistently high level of production, better than 8000 cars and trucks daily, since the latter part of October, and are trying to push this figure up to 9000 per day. The week ending Dec. 14, for example, saw 41,343 units assembled, a new postwar record. The total is calculated to be approximately 82 per cent of the average weekly production rate maintained during the 1941 model year. Comparison with the same week in 1941 is not logical, since five years ago the effects of early wartime curtailment in car output had been felt.

Sharp Costs Cuts Essential

The next 12 months may prove to be a year of decision for the automobile industry. It is now recognized as essential that costs be cut sharply if the industry is not to price itself out of the market, and the two principal avenues open are improved output per man and reduced indirect labor and overhead. The former must come from improved production methods and a more willing attitude on the part of labor. The latter is already being corrected.

As George Romney, general manager of the Automobile Manufacturers Association, told a group of newsmen last week: "Contrary to earlier trends, since 1936 output per man-hour has shown no increase, even though hourly wage rates between 1936 and 1946 increased from 76 cents to $1.33. Manufacturing costs have soared because of lower volume, higher material costs and higher wages. Profits have declined. Prices, again contrary to the historic trend, have been forced upward, primarily by the combination of these factors. This adverse cycle has reached the point where millions of previous car buyers are being priced out of the market. Further wage increases that are not based on increased output per man-hour will accentuate the unfavorable cycle of the past ten years and produce higher costs, higher prices, fewer customers and fewer jobs.

"Real wage increases cannot precede increases in productivity. Wages paid by any one employer in the motor industry cannot be made to depend on the profits made by a shirt manufacturer, a cattle raiser or a movie producer. That, obviously is the CIO auto union's basic economic fallacy compounded out of Robert Nathan's already discredited report."

It is no secret that the basic apprehension underlying the 1947 automotive outlook relates to labor. A demand of "23.5 cents per hour increase or strike" which some observers believe to be the CIO platform would be nothing short of ruinous, and sober analysis of current conditions rules it out. What probably will happen is that the UAW-CIO will start negotiations on this basis as the most it can hope to get, and finally may accept a much smaller increase, if indeed any at all, together with an approval of Saturday operations which would serve to increase take-home pay and at the same time step up weekly production by 15-20 per cent. This of course assumes a sufficient supply of parts and materials which are coming to be regarded less critically than was the case six weeks ago.

Another phase of reported union demands to be made on auto companies is more than a little disturbing in its cost implications. Dubbed a union social insurance program, it was probably suggested by the royalty payments which John Lewis won for his coal miners to build up a welfare fund. The plan calls for an employer contribution amounting to 3 per cent of the gross earnings of employees, such a fund to be administered by the union to provide benefits in the case of sickness or accident, as well as hospital, surgical, medical and maternity benefits designed to relieve union members from financial strains in health emergencies. On top of this the union is formulating details of an old-age pension plan to supplement the present federal social security regulations. The schemes would involve annual payments of millions of dollars into union treasuries for disbursement by persons of doubtful qualifications, to say the least, in the fields of insurance and pension plans.

Used 1946 Models High

An example of how the factors of supply and demand effect the automotive price picture is seen in the fact that low-mileage 1946 model passenger cars bring more on the used car markets than present factory list prices of the same cars. This has led to many weird practices in the distribution field. One case is that of dealers taking delivery on new cars, driving them for a few hundred miles and then selling them as used cars for $500 more than the cars would bring new. Another is the acceptance of low-mileage 1946 models as tradeins on new cars and then dispatching the tradeins to southern states or to California where they bring the high dollar. This completely upside-down price situation is by no means confined to an isolated dealer here and there, and doubtless will con-

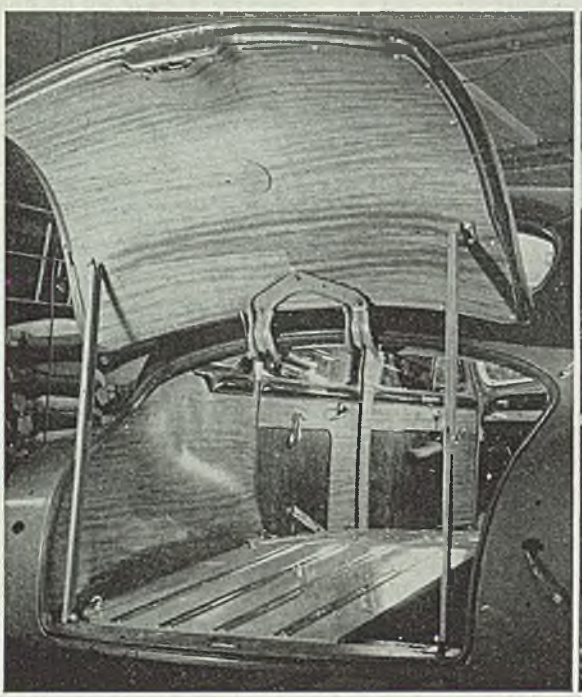
Automobile Production

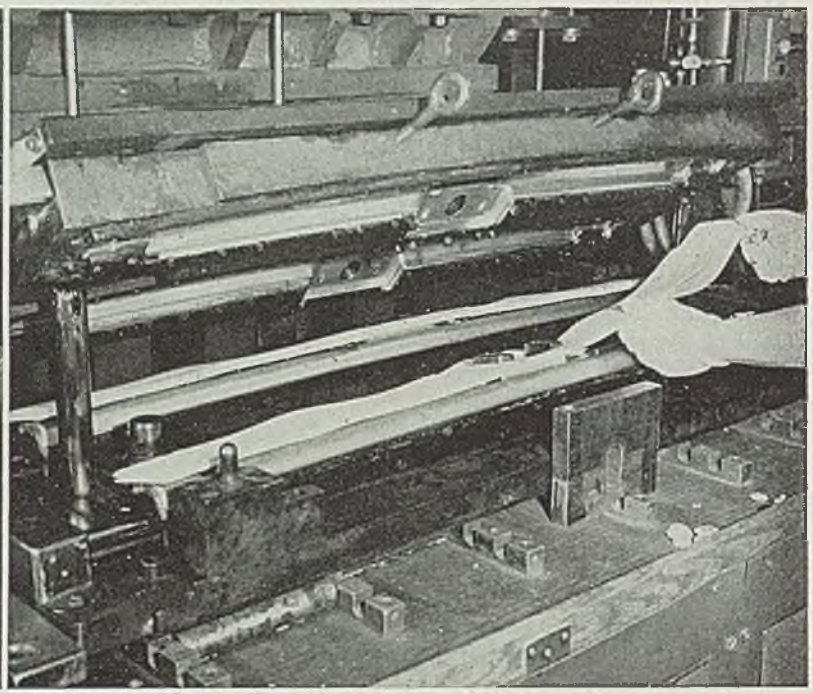
Passenger Cars and Trucks—U. S. and Canada

Estimates by Ward's Automotive Reports

	1946	1941
January	121,934	524,073
February	84,141	509,332
March	140,777	533,878
April	248,318	489,856
May	247,620	545,355
June	216,637	546,278
July	331,000	468,897
August	359,101	164,793
September	342,727	248,751
October	410,466°	401,369
November	379,014°	373,992
Total, 11 mos.	2,881,735	4,806,474
Estimates for week ended:		
Nov. 30	77,222	96,495
Dec. 7	93,907	92,205
Dec. 14	97,860	95,990
Dec. 21	98,000	70,875

° *Preliminary.*





Molded plastic parts in automobile body construction are in production by Briggs Mfg. Co. At left is a view of a De Soto Suburban body which shows the extensive use of plastics on the interior. Wood grains are reproduced on door panels, center pillar, rear quarter panel and rear deck lid. At right is shown the two-cavity die used by Briggs in fabricating molding for Packard. Photo shows the operator loading dies with the raw plastic sandwich

tinue until new car production more nearly catches up with demand and buyers again become choosy.

Plastics in Body Construction

Several years before the war, engineers of Briggs Mfg. Co. began studying possibilities of using molded plastic parts in body construction. They envisaged making rear deck lids, hoods, even door panels and fenders of plastics material. The work did not proceed to any great length and during the war plastic research was redirected toward equipment required in gun turrets which Briggs was building for the air forces. First practical application of these studies was an ammunition box formed from a basic material in the form of an impregnated plastic "sandwich" of wood pulp, rag board and sisal fiber. Existing automobile body presses were adapted to processing of the ammunition boxes, instead of the usual hydraulic presses. Once in production the box was molded in two halves on a 3-minute cycle; rejections were only a fraction of 1 per cent.

With the end of the war the Briggs plastic division became a full-blown manufacturing unit with A. W. Prance as supervisor of design and research. Now in production and used for the first time on the De Soto Suburban model is a decorative interior paneling and trim on the outer surface of which is reproduced in color and grain any type of wood, leather or cloth finish.

Two methods are used for processing plastic automobile trim. On large pieces such as interior panels, the plastic is pressed and baked in flat sheets. Each sheet is made up of half a dozen or more phenolic impregnated backing sheets, separator sheets and an outer surface sheet on which the finish design is printed by the offset process. This surface sheet is a thin layer of wood fiber paper or sisal paper which is impregnated with a clear plastic to make it semitransparent so that the tone of the printed design will not be impaired. The various layers are stacked in the press between steam heated platens and compacted under about 800 psi pressure.

Where contours are to be formed, such as in a rear quarter panel which covers the fender well, the cured laminate is placed in a forming fixture while still hot and shaped over wood forms. These fixtures also serve as templates for drilling holes and marking the stock for bandsaw trimming. Since the fixtures are inexpensive, the method is both economical and fast where large pieces are handled.

In producing parts with sharp contours or with bosses to accommodate metal inserts, a preform of the part is made and the extra pieces with inserts positioned for the final shaping and curing. On still other parts, the laminating and shaping is carried out in one operation on steel dies. Loading and unloading of dies is done outside the press bed, making possible the maximum utilization of press time by running duplicate dies from opposite sides of the press.

Cost of the plastic molded pieces is approaching that of formed steel parts used in similar locations. However, the finish obtained on the plastic appears to have much greater depth and surpasses wood or wood veneer panels in abrasion and scratch tests. Strength of course is considerably less than steel and the plastic panels do not match too well with steel on which a similar type of finish has been applied by conventional roller methods. These are the principal reasons why these present applications are being confined to nonstructural and interior parts. The development is still in its early stages, and Briggs engineers and officials are confident many extensions of the idea will be made in the near future. A number of the 1948 models in the Chrysler and Packard lines apparently will feature use of the new material.

Increases Engineering Staff

Two further additions to the Ford engineering staff have been made. William Burnett, associated with Cadillac for 17 years, has been named head of a newly created experimental engineering section at the Rouge plant. Philip H. Pretz, for the past 5½ years with Chrysler and prior to that engineer in charge of chassis development for Cadillac, has joined the Lincoln-Mercury division in charge of experimental engineering.


ARISTOLOY STEELS
STANDARD STRUCTURAL ALLOY
ALLOY TOOL
BEARING QUALITY
SPECIALTY
NITRALLOY
CARBON TOOL
STAINLESS
MAGNAFLUX-AIRCRAFT QUALITY
NONE FINER
COPPERWELD STEEL COMPANY
WARREN, OHIO

Control of Titan Metal Acquired By Mining Firm

Purchase by Consolidated Coppermines of large brass and bronze producer marks entrance in new field

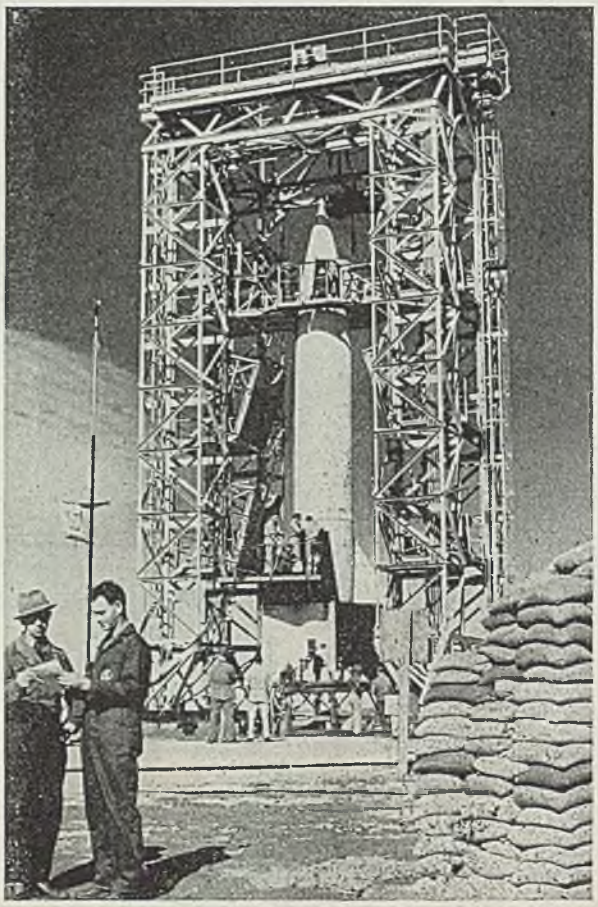
CONTROLLING interest in Titan Metal Mfg. Co., Bellefonte, Pa., has been purchased by Consolidated Coppermines Corp., New York, John A. Payne, president of Consolidated, announced last week. The Pennsylvania company, which was founded in 1915, is a large producer of brass and bronze rods, welding alloys, brass and bronze forgings, brass pressure die castings and related products.

Acquisition of Titan Metal marks the first time Consolidated has branched out into fields other than copper mining. Its holdings previously had all been located at Kimberly, Nev.

Titan Metal's assets as of Nov. 30 were $4,325,000, which figure does not include a $1,500,000 government-owned plant being operated by Titan under a lease arrangement.

Sales for the full year of 1946 are expected to reach about $10 million.

The company operates four plants in Bellefonte, one of which was purchased in 1944 from Baldt Seaboard Co., Dover, Del., and moved piecemeal to its present location.



GERMAN AIDS RESEARCH: A German specialist is assisting the Army in V-2 tests at the White Sands, N. Mex., proving ground. Eric Kashig, foreground left, who helped develop the rocket in Germany, confers with Barney B. Halbert, technician for General Electric Co., which supervises assembly and firing of the rockets

German Plant To Be Set Up at Stevens Institute

A complete German plant for manufacture of hard cemented carbides has been brought to the United States and will be installed soon in a newly constructed building at Stevens Institute of Technology, Hoboken, N. J., Gregory J. Comstock, professor of powder metallurgy and directory of research of the institute, has announced.

Used during the war by the Germans to make armor-piercing projectiles with cemented carbide cores, the equipment now will form the basis of a Navy-sponsored research program on high temperature alloys.

It has been loaned to Stevens Institute by the United States Ordnance Dept. for use on a Bureau of Ships research program, one phase of which the institute is undertaking for the government. The plant was selected for removal to the United States by Professor Comstock during an inspection trip in 1945 of the German hard cemented carbide industry.

Anderson Stove Submits High Bid for War Plant

Anderson Stove Co. Inc., Anderson, Ind., was the high bidder recently for the former Chevrolet-Anderson war plant. The stove company, which was purchased about a year ago by Breeze Corps. Inc., Newark, N. J., submitted a bid of $425,000 to War Assets Administration.

Reynolds Metals Leases Aluminum Mill from WAA

Reynolds Metals Co., Richmond, Va., has acquired the government-owned Newark, O., aluminum rolling mill from War Assets Adminstration, R. S. Reynolds Sr., president of Reynolds, has announced. The company acquired the plant under a five-year lease with option to buy.

The plant, which was built during the war at a cost of $23,200,000, is designed to produce ten million pounds of aluminum blooms and 15 million pounds of aluminum monthly. Its equipment includes a blooming mill, rod mills, and 60 furnaces with an annual melting capacity of 486 million pounds. The plant site covers 300 acres and the facility consists of 36 buildings.

Westinghouse To Construct Lamp Plant at Little Rock

Purchase of 27 acres in Little Rock, Ark., for a plant site for an incandescent lamp manufacturing plant has been announced by Ralph C. Stuart, vice president, Lamp & Lighting Divisions, Westinghouse Electric Corp., Pittsburgh. Construction of the plant is part of the company's $132 million expansion program.

Ground breaking for the new plant is expected to get under way in about three months, and production is tentatively scheduled for December, 1947. Machinery for the plant is now being built at the Lamp Division's headquarters in Bloomfield, N. J.

When completed the new plant, which will contain 150,000 square feet of floor space, will employ approximately 800 persons.

BRIEFS . . . .

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

American Well Works, Aurora, Ill., has increased productive capacity of its pump division between 40 and 50 per cent through completion of a new gray iron foundry at its Aurora plant.

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Riley Gear Corp., Buffalo, has been formed to manufacture industrial gears and machine parts by Walter J. Riley, president and treasurer. The plant will be equipped with $50,000 worth of machinery.

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Lindberg Steel Treating Co., Chicago, has opened a branch plant at 620 Buffalo Rd., Rochester, N. Y.

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D & S Model Co., Dayton, O., has moved to 105-45 S. Robert St., Ludington, Mich. The company manufactures surface grinder attachments and small tools, and does custom tool and die work.

—o—

Davey Compressor Co., Kent, O., will soon begin large scale production of eight standard-model power take-offs. The company plans formation of a truck equipment division to handle engineering, production and sales of the new product.

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Lincoln Electric Co., Cleveland, distributed $2.8 million in yearend bonuses to employees. Top payment was about $25,000, while others approximated 100 per cent of the employee's 1946 earnings. Although the total bonus was slightly less than that of last year the percentage received by each employee was up.

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Loewy Construction Co., New York, has been awarded a contract for erection of a complete metalworking and rolling mill installation in India.

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Robins Conveyor Division, Hewitt-Robins Inc., Buffalo, has consolidated its Chicago office with that of Hewitt Rubber Division, and both are now located at 7 S. Dearborn St., Chicago 3.

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Packaging Machinery Manufacturers Institute, New York, has established an office in Room 736, 342 Madison Ave., New York 17, following its detachment from Packaging Institute Inc., also of New York.

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Chevrolet Motor Division, General Motors Corp., Detroit, recently conducted a nationwide speaking tour, lasting five weeks, by Nicholas Dreystadt, general manager, and T. H. Keating, general sales manager, in which the two men flew almost 10,000 miles in a total flying time of 48 hours and four minutes, speaking before 22 meetings of Chevrolet officials. The flight was made in a company-owned Douglas B-23.

—o—

Fruehauf Trailer Co., Detroit, now completing its largest production unit, at Avon Lake, O., has announced that the plant's receiving and shipping facilities, both truck and rail, are located inside the plant, running the whole length of one side. Mechanical conveyors totaling 20,000 feet, extend the length of the dock area and travel into every part of the plant.

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Solar Aircraft Co., San Diego, Calif., has begun production of dairy equipment at its San Diego and Des Moines, Iowa, plants. The equipment is made principally of stainless steel.

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American Flange & Mfg. Co. Inc., New York, has prepared an inter-American, English-Spanish calendar for distribution to 150 oil companies in South America, Central America and the West Indies. The calendar consists of a 55-page plastic-bound booklet containing industrial and agricultural scenes in the Western Hemisphere.

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Douglas Aircraft Co. Inc., Santa Monica, Calif., has developed a procedure for fueling transport planes from beneath the wings at a rate nearly four times as fast as conventional wingtop methods.

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War Department, Washington, has announced discontinuance of its Cincinnati Engineer District and closing its district office there, effective Jan. 1. District offices at Louisville, Ky., and Huntington, W. Va., will absorb the discontinued office's activities.

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Ward Leonard Electric Co., Mt. Vernon, N. Y., has appointed Storer & Schemm, Cincinnati, as its industrial sales representatives for southern Ohio, eastern Kentucky, western West Virginia, and Clark and Floyd counties in Indiana.

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Air Materiel Command, Wright Field, Dayton, O., has under construction an Army Air Force's testing laboratory at Wright Field which, when completed, will be able to reproduce the worst types of inclement weather to be found in any part of the world.

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Beech Aircraft Corp., Wichita, Kans., has announced sale of four model D18S twin-engine Beechcrafts to two airlines in India. The company recently sold two of this same model plane to the Turkish government for photographic exploration work.

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Mosher Steel Co., Houston, Tex., has reopened a branch office in Lubbock, Tex., to serve the west Texas territory. The Lubbock office has been closed since 1941.

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Paper, Calmenson & Co., St. Paul, has moved to County Road B and Walnut St., that city.

—o—

Republic Rubber Division, Lee Rubber & Tire Corp., Conshohocken, Pa., has under way a large addition to its Youngstown plant, as the first step in its expansion program. The building, costing over $100,000, will provide warehouse and shipping space, and will free part of the main plant for additional manufacturing room.

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Copper & Brass Research Association, New York, has admitted Harvey Machine Co. Inc., Los Angeles, to its membership.

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Charles T. Brandt Inc., Baltimore, has established an assembly line for the manufacture of a standard metal truck body at its Leonhardt Body Corp. Division in that city.

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Hill-Chase Steel Co., Baltimore, has opened its new warehouse and office at 6311 Erdman Ave., Baltimore 5.

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Pennsylvania Salt Mfg. Co. of Washington, Tacoma, Wash., has opened a new general district sales office at the company's chemical manufacturing plant in Portland, Oreg.

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General Electric Co., Schenectady, N. Y., has given Charles A. Coffin awards to 95 of its employees who performed work of outstanding merit during the period of 1942-1945.

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Bartlett-Hayward Division, Baltimore, Koppers Co., Pittsburgh, has begun production of Koppers-Elex precipitators, a Swiss-invented apparatus, for which it has acquired exclusive manufacturing and sales license rights in North America. The device is used for removing either solid or liquid particles from plant discharge gases.

Industrial Development Program Charted for San Francisco Area

Broad plan of action for 1947 announced by area council aimed at expanding district's existing industries, bringing in of new factories, developing new markets and creation of job opportunities. Co-ordinated area-wide planning proposed

SAN FRANCISCO

THE SAN FRANCISCO Bay Area Council has announced a broad plan of action for 1947, designed to unify this area's expansion and to speed its industrial development.

The council, on whose board are representatives of all leading industries as well as those of labor and government, ties together the nine counties, with their 60 communities, into an organization for fostering the growth of the San Francisco area. Its proposals aim at expanding industries, bringing in new factories, and finding new markets and developing jobs for this region.

For 1947, the council has outlined a broad four-point program. As outlined by Frank E. Marsh, executive vice president and general manager of the council they are:

1. Industrial development: Acting in co-operation with Bay area chambers of commerce, industrial realtors and industry development officials of major industries, the council will serve as a clearing house for site information and assist prospective new industries in locating in the Bay area.

2. Transportation and shipping: The council will recommend action to effect an early decision on a second bay bridge crossing; to study the need for a single port authority in the Bay area; to review action needed for a master transportation plant; and to recommend a master airport plan for the Bay area.

3. World trade development: The council will take action to promote additional cargo movements through the ports of San Francisco bay; give assistance to the development of the proposed world trade center; recommend action needed for the establishment of a foreign trade zone; and develop plans for a world trade guide that will contain full information on harbor facilities, export-import services and related trade information.

4. Area planning: The council will study ways and means of developing a Bay area master plan, with adequate industrial and residential zoning, to be completed in co-operation with existing planning commissions, and state and local planning organizations.

Mr. Marsh stressed the need for co-ordinated area-wide planning and organization in developing a balanced metropolitan area that would adequately provide for the expanding population of 2,500,000 citizens now living in the 7000 square miles of the nine-county San Francisco Bay region.

Members of the Netherlands Purchasing Commission, on a buying trip to San Francisco recently, purchased 7500 tons of steel from government surplus through the War Assets Administration. The purchases include 3000 tons of steel sheets, 2500 tons of steel pipe and 2000 tons of structural steel. It will be used in reconstruction of Dutch cities.

According to reports from Salt Lake City, Utah Copper Co. is adding $3 million of equipment to its electrical generating plant at the Arthur, Utah, mill.

Foundations now are being installed for two new 25,000 kw generators and another boiler with auxiliary pumps and other equipment.

Steel Warehouses Placing New Orders Carefully

LOS ANGELES

Steel warehouse purchasing agents currently are "canceling more orders than are being placed." Reason given was

LUXURY LINERS: Two 22,900-ton liners are shown in the Bethlehem-Alameda Shipyard Inc. at Alameda, Calif. They are the *President Wilson,* shown on ways at left, and the *President Cleveland,* at outfitting docks on right. They are being built under Maritime Commission contract for operation in fast trans-Pacific passenger, mail and refrigerated freight service by the American President Lines

that mills are accepting but not scheduling many orders and that southern California buyers are hedging for fear of being caught on "items like quarter inch plates." This size plate, it was explained, was one of the scarce items until recently, when "overnight" the situation changed and quarter-inch plates became a drug on the market.

The wave of protective buying here brought on by the coal strike has subsided. Inventories, however, remain at relatively high levels.

Chief bottleneck is merchant pipe. Jobbers' stocks are virtually nonexistent, all sizes being snapped up at or before delivery from mill sources.

Caine Steel Co. Building Warehouse at Emeryville

EMERYVILLE, CALIF.

Caine Steel Co. of California will complete a $250,000 steel supply and service plant here next March, Marshall Wais, vice president and general manager, has announced. The Emeryville plant will contain 68,000 sq ft of plant space. It will be in charge of Max Rudorfer, northern California manager.

Equipment will include a modern unit for steel slitting and roller leveling, shearing equipment, planagraph cutting tables and other facilities to handle all steel products rapidly and efficiently.

Baton Rouge Alumina Plant Starts Production

OAKLAND, CALIF.

Another step in integration of the Kaiser Aluminum industry has been completed with start of production at the Baton Rouge alumina plant of the Permanente Metals Corp., which is expected to reach capacity sufficient to supply Permanente's alumina requirements before the end of this month.

Alumina from Baton Rouge is being shipped to Permanente's aluminum reduction plant located at Spokane. The Spokane plant has previously purchased alumina from government inventories.

In announcing the start of production at Baton Rouge, officials said the government allocation of soda ash, which is necessary for production of alumina, has been set up on the basis of 85 per cent of the aluminum industry's requirements. The Baton Rouge plant, under these conditions, will thus produce only 85 per cent of Kaiser requirements.

Production at Baton Rouge is under supervision of John Garoutte, works manager, formerly in charge of Permanente's two magnesium raw material plants in California.

Pacific Northwest Steel Rolling Mills Operating at 90 Per Cent

Producers making effort to clean out old orders before accepting important commitments for 1947. Potential demand for reinforcing bars heavy. Water shipments of steel improved but receipts are still limited

SEATTLE

ROLLING mills report steady operations at about 90 per cent of capacity. Backlogs are the immediate concern and it is planned to clean up old orders befor taking important commitments in 1947.

The potential demand for steel reinforcing bars is heavy but many projects have been set back because of the unexpected high costs of construction. Stock reinforcing is extremely scarce, reinforcing, except for small sizes, being easier. Mills are hoping for higher prices. Business pending includes about 200 tons for a hospital at Yakima, bids Dec. 30, 100 tons for a bridge in Yakima County and unstated tonnages in two Washington state bridges. School construction and an extensive building program at the University of Washington involve large tonnages.

Fabricators report much inquiry but shops are careful in making commitments on account of low inventories and uncertainty of delivery, jobs promised in October being now set for January-February delivery. Water shipments of steel, long delayed on account of the strike, are beginning to arrive but receipts are far below requirements and no immediate improvement is in sight. Washington state purchasing agent has called bids at Olympia Dec. 26 for 1000 tons of shapes required for a Columbia river highway bridge. Unstated tonnage is involved in a steel frame telephone exchange at Klamath Falls, Oreg.

Westinghouse is low, $64,092, to Bonneville Power Administration for transformers for Goldendale and Kalispell substations. Tacoma has awarded 70 tons of copper wire to the same producer. Denver has calls out for bids for numerous projects in the Northwest, bids in early January. American Bridge is low $19.290, for an outlet wheel, Titan Metal Products Co. low $10,312 for prefabricated steel building, John W. Beam, Denver, low, for $9410, for control gates at Pasco, General Electric low, $20,798, for circuit breakers. Two 100-ton cranes and one 60-ton crane for the Columbia Basin project have been placed with Whiting Corp., Harvey, Ill., low at $216,465.

Seattle-Boeing Aircraft Co. has an Army order for 73 additional B-50 bombers. The company announces its active projects constitute a sizable production program for both the Seattle and Wichita plants, aggregating nearly $200 million. Employment at Seattle now approximates 12,000.

Suspension of the Boeing 417 local service transport project because of changed conditions and present market uncertainties in this field has been announced by W. M. Allen, Boeing president. Actual manufacture of this type has not begun although the project was in the engineering and preliminary tooling stage at Wichita.

"We believe that the Boeing 417-type, a 20 passenger plane specifically designed for operating economy and utility on regional airlines and lines making frequent local stops, would greatly enhance the growth of this important field," Mr. Allen stated. "However, a careful resurvey of the field shows an insufficient present market to justify proceeding with the project at this time. Not only is the aggregate mileage of new feeder lines being certificated much smaller than anticipated, but the route certificates are being granted on a temporary three-year basis. Few of these lines are now in position to commit themselves beyond immediately available equipment, consisting chiefly of converted surplus Army planes. The current market for this type airplane among major airlines also appears limited."

Alcohol By-Products Plant Sold

Announcement is made of the sale of the Bellingham alcohol by-products plant to the Puget Sound Pulp & Timber Co. for $450,000, built in 1944 by the RFC at a cost of $1,134,803. The plant uses waste sulphite liquor from the unbleached sulphite wood pulp operations of Puget Sound, heretofore of no economic value. The buyers may expand operations to manufacture denatured alcohol.

John Deere & Co., Moline, Ill., is reported to have purchased the Yakima plant of Lindman Power Equipment Co., occupying 8 acres and employing 350. The local plant has been producing a crawler attachment for orchard type tractors.

Men of Industry

JOHN G. FRITZINGER

HENRY W. PARKER

S. E. VORAN

John J. Fritzinger has been appointed district sales manager, Philadelphia office, Carborundum Co., Niagara Falls, N. Y. He succeeds **Williard J. Griffith**, who has resigned to form an industrial supply company with **Paul E. Raguse**. Mr. Raguse has resigned his position as industrial salesman in the Philadelphia area. The principal business of the new company will be the distribution of Carborundum products in the Philadelphia metropolitan area. Mr. Fritzinger had been a sales engineer in the Philadelphia area for the Refractories Division of the Carborundum Co. Mr. Griffith joined the company as a sales representative in 1912, and was appointed district sales manager in Philadelphia in 1926. Mr. Raguse was appointed sales service engineer in 1926, and since 1937 has served as an industrial salesman. Mr. Fritzinger's new appointment and the resignations of Messrs. Griffith and Raguse will become effective Jan. 1.

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Fred D. Gearhart, Raymond T. O'Keefe Jr. and **Leo T. Norville** have been named directors of Kropp Forge Co., Chicago, along with **Roy A. Kropp, Raymond B. Kropp, James E. Sweeney** and **Charles F. Johnson**. The following company officers were all re-elected: Roy A. Kropp, president; Raymond B. Kropp, vice president and treasurer; Raymond T. O'Keefe Jr. and James E. Sweeney, vice presidents; and Charles F. Johnson, secretary.

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Clarence G. Roll has been appointed purchasing agent, Ashland, Ky., Division, American Rolling Mill Co., Middletown, O., succeeding the late **C. J. Moegling**. Mr. Roll joined American Rolling Mill Co. in 1919, as a timekeeper in the Zanesville, O., plant. He spent several years in personal relations work, and later became a supervisor in the hot mill department. In 1927, he was named assistant supervisor of purchasing, and the following year was appointed supervisor of purchasing and stores at the Zanesville plant. Mr. Roll transferred to the general purchasing department in the company's general offices in Middletown in 1945, and then to Ashland, where he became acting purchasing agent last August.

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Henry W. Parker has been appointed to the newly created post of technical adviser for Sylvania Electric Products Inc., New York. At present he is working with the United States Department of Commerce, office of Technical Services, Technical Industrial Intelligence Division, in its study of electron tube developments in Germany and Japan during the war. Prior to joining Sylvania, Mr. Parker was with General Electric Co., Schenectady, N. Y., and Rogers Radio Tubes Ltd., Toronto, Canada.

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Kelsey Lingo has been appointed purchasing agent, Refrigeration Division, Terryville, Conn., Bowser Inc., Ft. Wayne, Ind.

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R. M. Ellis has been elected vice president, Hungerford Plastics Corp., Murray Hill, N. J. Mr. Ellis, who has been with the organization since its founding in 1942, retains his position as chief mechanical engineer.

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J. Milton Hagler has been elected president, Tay-Holbrook Inc., San Francisco, succeeding **Hugh E. Oliphant**, who has retired. Mr. Oliphant will continue with the firm as a director. The following men have been elected vice presidents of the company: **Arthur N. Brewer**, manager of purchases; **Arthur M. Walton**, manager of sales; **James P. Owens**, manager of Fresno, Calif., branch; **Francis J. Fay**, manager of Sacramento, Calif., branch; **Harry B. Oliphant**, manager of Oakland, Calif., branch; **Paul H. Kankel**, manager of San Jose, Calif., branch; and **Vincent Kavanaugh**, manager of Stockton, Calif., branch.

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S. E. Voran has been appointed advertising manager, Parker Appliance Co., Cleveland. Prior to joining Parker, Mr. Voran was an account executive for Fuller & Smith & Ross Inc., Cleveland. Previously he had been advertising manager, Pesco Products Co., Cleveland, a subsidiary of Borg-Warner Co., Chicago.

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Robert D. Sowers has been appointed to the Industrial Sales Division of the Sharon, Pa., plant, National Malleable & Steel Castings Co., Cleveland. Mr. Sowers joined the company in 1936, and worked in several departments at the Sharon plant. He served in the Navy during the war, and returned to the company last April.

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Alfred E. Stacey Jr., one of the founders of Carrier Corp., Syracuse, N. Y., has rejoined that company, following his release from the Navy. He will be process consultant to the Sales Division, and will devote much of his attention to the application of temperature and humidity control to industry. When Carrier Air Conditioning Co. of America was organized in 1908, Mr. Stacey became chief engineer. In 1915, he was one of the seven founders of Carrier Engineering Corp. After 5 years as western manager, he became chief research engineer, which position he occupied from 1919 to 1930. When Carrier Corp.

Research Man With A Loose Foot

The Armco research man is no homebody. This sheet steel specialist is always on the move—visiting designers and manufacturers of buses, streamlined trains and planes, television equipment, and new steel products for home and industry. And he takes his research skill along—works right in the plant with the men who make the products.

Knowledge gained this way helps Armco tailor sheet steel to a particular need—to route scores of different orders through the mill departments for individual processing.

Out of this teamwork between Armco and the manufacturer have come many ideas for improving fabricating methods and cutting manufacturing costs. Also ideas for such special-purpose sheets as ARMCO PAINTGRIP that takes and holds paint, Ultra-thin Electrical Steels, new Aluminized steel and others.

SPECIAL PURPOSE ARMCO SHEET STEELS

Back of this fact-finding in the field stand the modern laboratories of The American Rolling Mill Company. These laboratories, which had their beginnings 45 years ago, give Armco the oldest and largest research organization in the field of special-purpose flat-rolled steels.

The days ahead will bring even greater demand for versatile sheet steels. Armco research, working closely with the men planning new products, can be counted on to develop the special sheet steels to do the job—and do it best. The American Rolling Mill Company, 3161 Curtis Street, Middletown, Ohio.

EXPORT: THE ARMCO INTERNATIONAL CORPORATION

THE AMERICAN ROLLING MILL COMPANY

DAN J. SHEEHAN

C. E. HERINGTON

was formed in 1930, he became vice president in charge of engineering. In 1935, Mr. Stacey left Carrier to organize Buensod-Stacey Inc., and in 1940 he entered the Navy.

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Dan J. Sheehan has been appointed manager of the Danville, Ill., plant, Hyster Co., Peoria, Ill. Mr. Sheehan was superintendent of motive power for Chicago & Eastern Illinois Railroad in Danville for the last 14 years.

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Clarence H. Sample has joined the electroplating section, nickel sales department, International Nickel Co. Inc., New York. He will work on the development and sales of nickel plating. From 1930 until Oct., 1945, Mr. Sample was on the technical staff of Bell Telephone Laboratories Inc., New York, where his duties included research and development on corrosion and metallic finishes.

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A. Verne Jackson has been named Detroit sales representative, Muskegon Piston Ring Co., Muskegon, Mich.

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A. W. Wigglesworth has been elected chairman of the board, Hill-Clarke Machinery Co., Chicago. **H. W. Mons** has been elected president of the company, and **W. L. Ditfurth**, vice president and treasurer. **T. H. Price** has been elected secretary. Mr. Wigglesworth was president of the company, and Mr. Mons was vice president.

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Arthur A. Leedy has been appointed director of engineering, Seiberling Rubber Co., Akron.

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Dr. L. B. Sebrell has been appointed director of research and chemical products development, Goodyear Tire & Rubber Co., Akron. **Dr. H. J. Osterhof** has been appointed manager of the company's research department. **Dr. A. M. Clifford** has been placed in charge of basic raw materials research. **H. A. Endres** has been placed in charge of chemical products research, and **J. A. Merrill** in charge of mechanisms and processes research.

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C. E. Herington has been appointed manager of the newly created sales engineering department, Meehanite Metal Corp., New Rochelle, N. Y. Mr. Herington has been director of advertising and sales promotion for the company and will continue these duties along with the direction of the new department. The sales engineering department has been established to provide an advisory engineering service to users of castings, and to assist them in solving problems involving application, design and sources of supply.

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C. V. Booth has been named chief financial officer, Fisher Body Division, General Motors Corp., Detroit, succeeding M. E. Sheppard, who has resigned.

—o—

Nelson F. Bowe has been appointed district sales manager, Edgewater, N. J., Ford Motor Co., Dearborn, Mich. **C. J. Seyffer**, who had been serving as both regional manager of the company's eastern region, and district manager at Edgewater, will devote his time to management of Ford and Lincoln-Mercury eastern regional sales activities.

—o—

John V. Drum has been appointed manager of farm equipment sales, Graham-Paige Motors Corp., Detroit.

—o—

Lloyd E. Tracy has been elected vice president, Oil Well Supply Co., Dallas, Tex., a subsidiary of United States Steel Corp. He also retains the position of general manager of sales of the company. Mr. Tracy came to Oil Well Supply Co. in 1935 from National Tube Co., Pittsburgh, another United States Steel subsidiary, having started with National Tube in 1927. He was appointed general manager of sales of the Oil Well company in 1943.

—o—

R. L. Whitney has been appointed district apparatus and supply manager, east central district, Westinghouse Electric Supply Co., New York.

—o—

Samuel Prescott has been appointed general office manager, credit manager and comptroller, Jules Alexandre Inc., Harrisburg, Pa., distributors for Crosley Corp., Cincinnati. Mr. Prescott served with the Army for 3 years during the war.

—o—

Clifford V. Jones has been appointed sales engineer for northern Ohio, McInnes Steel Co., Corry, Pa. He will have his office in Cleveland. **Martin A. Eliason** has been appointed sales engineer for Wisconsin, Illinois, Indiana and Minnesota for the McInnes compay. His office will be in Milwaukee.

—o—

Lee G. Miller has been appointed plant manager of all operation at Lebanon, Pa., Lebanon Steel Foundry, succeeding **Frank J. Stanley**, resigned. Mr. Miller had been superintendent of the organization.

—o—

Charles B. Grace, vice president and treasurer, Heintz Mfg. Co., Philadelphia, has been elected a member of the board of directors of Pennsylvania Salt Mfg. Co., Philadelphia.

—o—

Harold S. Silver has been named general patent attorney in charge of the patent department, Legal Division, Allis-Chalmers Mfg. Co., Milwaukee, succeeding the late J. J. Kane. Mr. Silver has

R. B. TRIPP

Who has been named executive vice president, Ohio Forge & Machine Corp., Cleveland, noted in STEEL, Dec. 16 issue, p. 82.

Always running for industry—

Wolff Steel Service

BENJAMIN WOLFF AND COMPANY

General Office and Warehouse — 58th St. at Seeley Ave., Chicago 36, Ill.

Wisconsin Office — 176 W. Wisconsin Ave., Milwaukee 3, Wis.

R. C. TODD

Who has been elected a vice president, American Rolling Mill Co., Middletown, O., noted in STEEL, Dec. 9 issue, p. 84.

HAROLD P. CURTIS

Appointed Pacific Coast sales manager, Babcock & Wilcox Tube Co., Beaver Falls, Pa., noted in STEEL, Dec. 9 issue, p. 80.

RUDOLPH T. ELSTAD

Who has been elected president, Oliver Iron Mining Co., Duluth, noted in STEEL, Dec. 9 issue, p. 80.

been with Allis-Chalmers since 1933, and prior to that was with the United States Patent Office.

—o—

Albert C. Walsh, purchasing agent, Timken Roller Bearing Co., Canton, O., has retired after 26 years' service with the company. He joined Timken when the company purchased the assets of Gilliam Mfg. Co., with whom he was then employed.

—o—

George H. Powers has been appointed boron carbide engineer, Norton Co., Worcester, Mass. He will cover the sale and application of company products in the New England territory, as well as in New York, Philadelphia, Pittsburgh, and upper New York state.

—o—

V. L. Follo has been appointed general superintendent of the new Uitenhage, South Africa, tire and mechanical goods plant, Goodyear Tire & Rubber Co., Akron. Mr. Follo has been with Goodyear for 26 years, and opened the company's tire factory in Norrkoping, Sweden, in 1938. He was recalled to Akron in 1942 to head production of Plant D, Goodyear Aircraft Corp. Mr. Follo's chief aids at the new plant will be N. A. **Nigosian**, engineering manager, and the following division superintendents: **Fred B. Conrad, Eldred L. Stanley, A. F. Novick** and **Harold Wilson.**

—o—

F. G. Jewett has been named manager of sales promotion, American Can Co., New York. Mr. Jewett had been assistant manager of sales of the company's Atlantic Division. He joined the company in 1916.

—o—

Bernard Schaenen, American Iron & Metals Inc., Dallas, Tex., has been re-elected president of the Gulf Coast chapter, Institute of Scrap Iron & Steel Inc. Other officers re-elected are: First vice president, **Jacob Gachman**, St. Louis Waste Material Corp., Ft. Worth, Tex.; second vice president, **Sidney Byer**, Houston Compressed Steel Corp., Houston, Tex.; and secretary-treasurer, **Cyril M. Coguenhem**, Luria Bros. & Co., Houston. **Max Clairfield**, Sampson Machinery & Supply Co. Inc., Houston, has been re-elected chairman of the chapter's executive committee.

—o—

Francis J. Wakem has been appointed vice president of Johns-Manville Sales Corp., subsidiary of Johns-Manville Corp., New York. He will also continue as merchandise manager of the Industrial Products Division. Mr. Wakem joined Johns-Manville in 1921.

—o—

Capt. H. K. Clark, former chief of the Navy Plant Operations Division, has been elected executive vice president and director, Carborundum Co., Niagara Falls, N. Y. He will be in charge of an expansion and modernization program at the firm's plants at Niagara Falls, in Canada, at Perth Amboy, N. J., and abroad. Prior to joining government service, Captain Clark was vice president and general manager, Norton Co., Worcester, Mass.

OBITUARIES . . .

Theodore H. Venn, one of the founders of Venn-Severin Machine Co., Chicago, died in that city, Dec. 11.

—o—

William C. Gaddis, 59, general manager, Anderson, Ind., Anaconda Wire & Cable Co., died in Anderson recently.

—o—

James S. Watson, 72, former vice president and director of the Indianapolis plants, Link-Belt Co., Chicago, died at his home in Indianapolis, Dec. 9. He had retired in January, 1944, and at the time of his death was president of the city board of public works and sanitation. Mr. Watson joined Link-Belt in 1893 in the order department. He came to Indianapolis in 1921 as manager of the Dodge plant, and later became manager of the Ewart plant of the company. He became vice president in 1929.

—o—

David FitzGerald, 51, manager of employee relations for the Plastics Divisions, General Electric Co., Schenectady, N. Y., died recently at his home in Pittsfield, Mass. Mr. FitzGerald joined GE in Schenectady in 1921, as clerk in the disbursements section of the accounting department. In 1925 he was promoted to the corporate accounts, and the following year became one of the company's traveling auditors. After serving in that capacity for 8 years, he was appointed auditor for the plastics department, with headquarters in Pittsfield. In 1940 Mr. FitzGerald was named assistant to the manager of the Plastics Divisions, and last May was made manager of employee relations.

—o—

Charles F. Byerly, 71, for the last 20 years Chicago district manager, Toledo Scale Co., Toledo, O., died in Chicago recently.

—o—

Herman G. Young, 62, since 1942 safety director in Aurora, Ill., Independent Pneumatic Tool Co., Chicago, died in Chicago, Dec. 9.

Steel Shortage Hinders Britain's Postwar Industrial Recovery

Effective home demand estimated at 16 million tons, 3.5 million more than total output. Only limited tonnages of imported steel available. Industrialists question wisdom of machinery export policy

BIRMINGHAM, ENGLAND

BRITAIN'S effective home demand for steel this year, without taking exports into consideration, is estimated at 16 million tons, several million more than ever have been produced in war or peace.

Home production so far this year has been about 11.7 million tons and the total for the year is expected to be about 12.5 million tons.

The resulting shortage has hindered Britain's postwar recovery, but the shortage is due to factors which neither the government nor the Iron & Steel Federation can control at this time.

These conclusions were given the House of Commons recently by H. Morrison, Lord President of the Council.

Mr. Morrison said it had been hoped to supplement domestic production by imports but they had been unable to get more than 500,000 tons at the outside this year because the huge American industry which, unlike that of Britain, was greatly expanded during the war, was proving no more equal than Britain's to coping with home demands.

Nationalization Still Planned

Mr. Morrison said the government was doing all it could to help the industry by giving preferential treatment for coal, and by manning-up in under-manned sections, including iron foundries and the older sheet and tin plate mills. He emphasized that in spite of what had been said in some quarters the government had not retreated and would not retreat from its determination to nationalize the industry.

Actual figures of imports as disclosed by the Board of Trade show that from January to October Britain imported 19,148 tons of pig iron, 65,584 tons of steel ingots, 263,214 tons of semifinished steel and 20,010 tons of wire rods. Comparing these with the corresponding figures of 1945 the most striking changes relate to pig iron, pig iron imports then being 103,621 tons and steel semifinished only 59,281 tons.

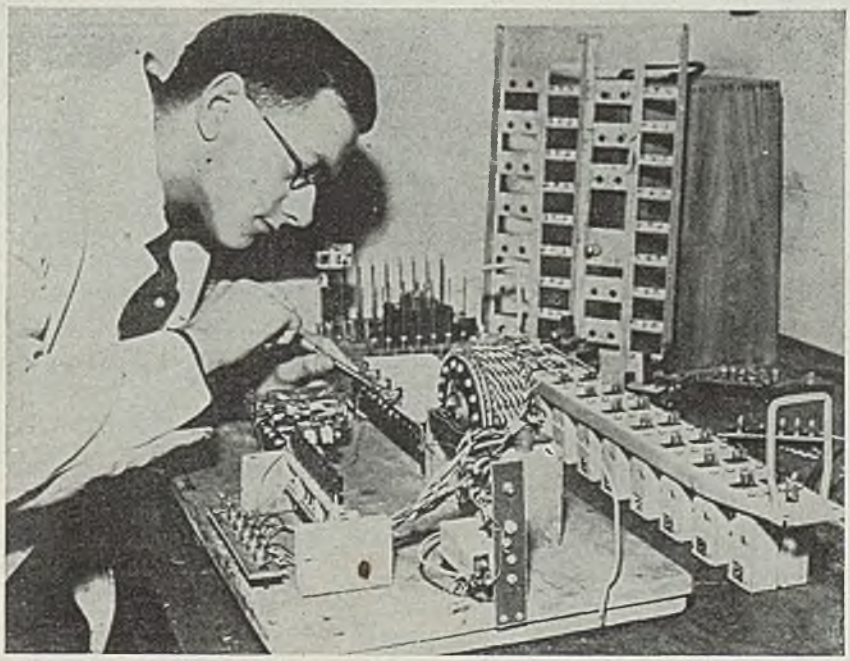
The question of how much steel, whether manufactured or otherwise, should go abroad still is being hotly debated. While it is true that export of raw steel has been curtailed severely criticism has been forthcoming that too much machinery is being exported, machinery that should be used to re-equip British factories. At a recent conference organized by the federation of British industries doubts were expressed on the advisability of exporting a substantial proportion of capital goods to enable other countries to equip factories with new machinery. This policy, it was contended, was strengthening the position of competitors of Britain at a time when there was a shortage in British factories that prevented production of export goods.

Re-rollers have given up hope of expecting further imports of steel from America in view of the labor troubles in that country. Semifinished steel, now being used on a very extensive scale, is coming from the British Dominions in increasing tonnages. Owing to the enormous demand for sheets for the automobile industry and for the production of steel houses, re-rollers are using sheet bars at a very high rate. Steel sheet and plate mills are booked for a very long period ahead and there is not the slightest sign that conditions of supply and demand will become easier during the next few months.

Big tonnages of steel are being used by the railroad companies and by the big concerns in the Midlands and the North who produce rolling stock for shipment abroad.

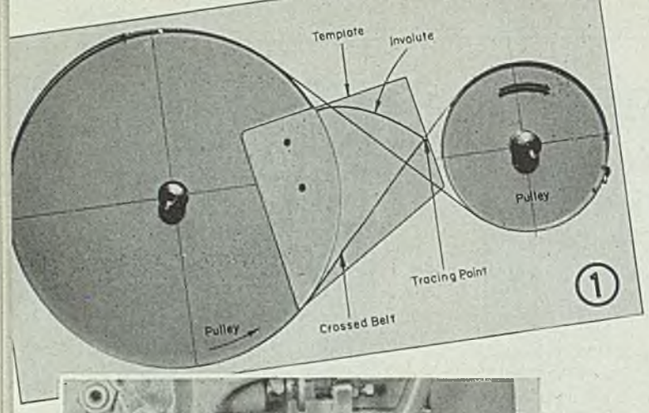
A vast amount of work is waiting for structural engineers as soon as the steel is available. In the big cities such as London, Bristol, or Birmingham the task of rebuilding bombed premises has scarcely yet begun, due to so much raw material being required for industry.

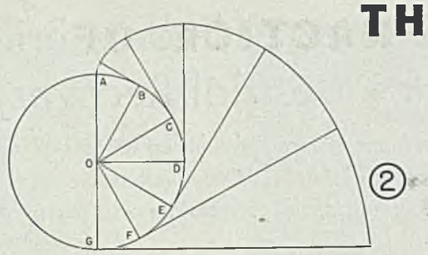
A big labor campaign is in progress to recruit men for the foundries. The housing drive is being pushed ahead by the government but "bottlenecks" frequently occur through lack of raw materials, especially the products of the foundries making light castings, and there are constant expressions of dissatisfaction up and down the country with the progress, or as some would term it, the lack of progress. As more labor is imported to the foundries so the demand for pig iron will increase and more blast furnaces will probably be lit before very long.

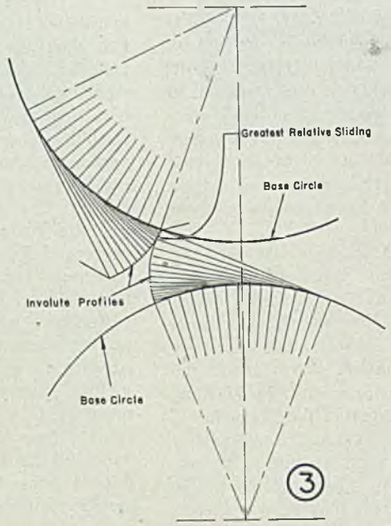


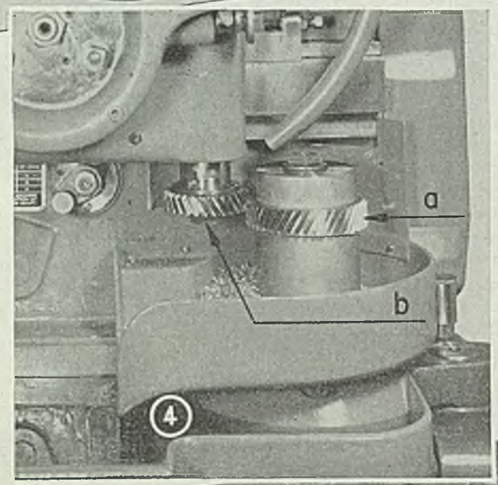
MECHANICAL "BRAIN": British scientists are working on an artificial "brain" which reportedly will surpass in many ways the capabilities of the human mind. Named the "Ace", it is to be capable of solving in a split second, mathematical problems which would take the keenest human intelligence many weeks. Scientists say it will possess a certain amount of memory and ability of judgment and choice. It will cost $400,000 and will use 18,000 valves and 5000 switches. Pictured is a worker wiring a section of the "Ace." NEA photo

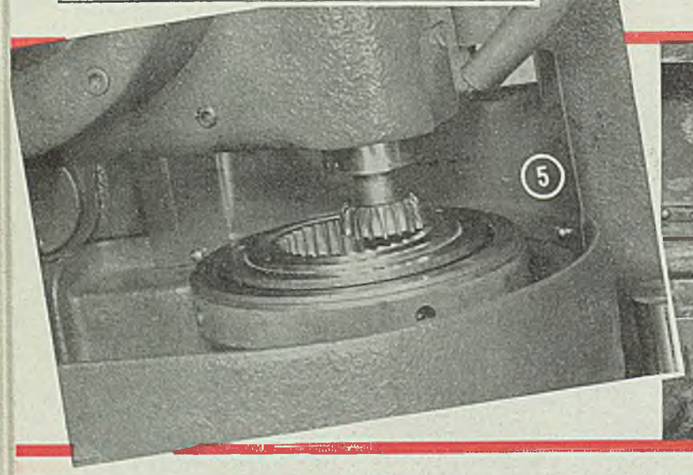
THEORY AND PRACTICE OF Gear Generating

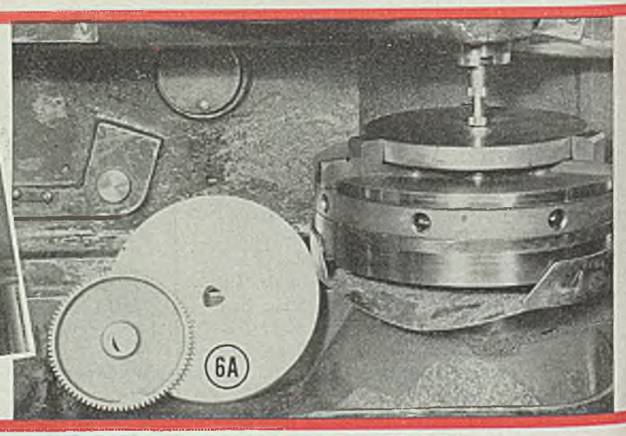












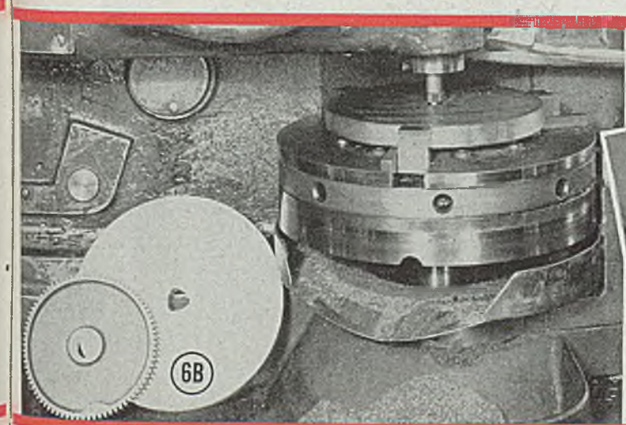
GEARS offer the most practical means for transmitting uniform angular velocity, but the shape of the teeth has an important bearing on smoothness of the transmitted motion. Requirements for transmitting angular motion uniformly are best met by the use of gear whose outlines are involute curves.

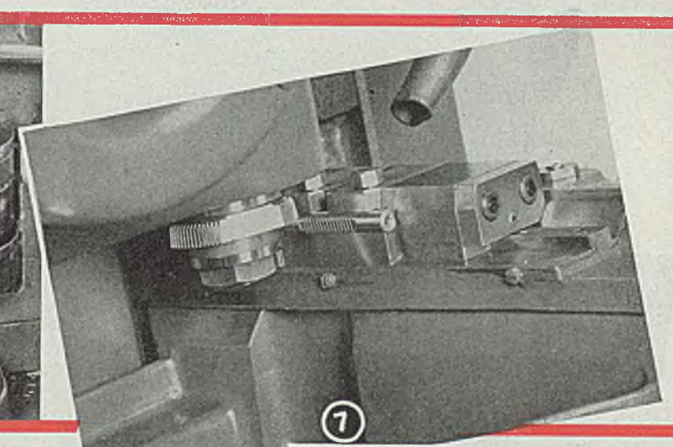
An involute may be quite simply generated or traced by employing the set up shown in Fig. 1. In this case the curve is traced—on a template attached to the large pulley—by a point on a taut crossed string as it moves from the larger to the smaller pulley. If a template is attached to the smaller pulley, the point—moving in the opposite direction—will then trace a mating profile. By cutting these templates to the traced curves, the mating involute profiles will transmit angular motion through a slight arc of rotation when the connecting cord is removed.

Continuous uniform angular motion can be obtained by providing a succession of parallel profiles, equally spaced so that one pair always comes into operating position before the preceding pair loses contact. In order that uniform motion thus can be transmitted in either direction, similar profiles are provided for each side of each of the teeth.

The involute of a given base circle derived geometrically as shown in Fig. 2 may illustrate more clearly the involute as a function of a circle. Circumference of the circle is divided into equal arcs AB, BC, CD, etc.; tangents are drawn at points B, C, D, etc., of lengths equal to the distance described by the arc from point A to the point from which the tangent is drawn. Involute of the circle is obtained when a smooth curve is drawn to connect the tangents.

This method of obtaining the involute is modified slightly in obtaining the profile of the tooth. Obviously, the curve for the tooth must be drawn on a smaller scale, otherwise the teeth would be disproportionately large. To obtain smaller teeth, the angles subtended by the arcs must be made smaller, i.e., the circle is divided into a larger number of segments. Otherwise the method of obtaining the tooth profile does not differ appreciably from the method of obtaining the involute as described in the preceding paragraph. (*Please turn to Page* 101)





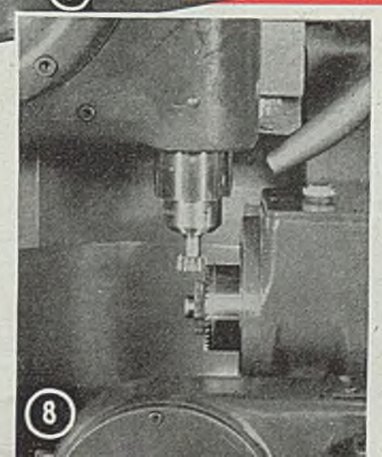


Fig. 1—Model of transparent plastic, illustrating that a point in a crossed belt will—when this pulley system is rotated—trace an involute curve on an attached template

Fig. 2—An involute curve may be constructed geometrically as indicated. Tangents, whose lengths equal the distance of the arc from point A to point at which it is drawn, are erected at equidistant points along the circumference of a circle and are connected by a smooth curve

Fig. 3—Involute teeth slide upon each other throughout their entire period of contact. Here base circles are divided into an equal number of spaces, and tangent lines are drawn from the division points to involute profiles. Rate of sliding is greater when end of one profile contacts its mate in vicinity of base circle

Fig. 4—Close-up of gear shaper cutting an external helical gear. Work (a) is held on reverse taper work-arbor which in turn is held in the work-spindle, thus accurately locating the gear. Cutter (b) is placed on the cutter-spindle, in this case face down so as to cut on the "push" stroke. Helical motion is imparted to the cutter by a helical guide and mating member shoes. Helical guides are made in pairs, right and left-hand, and of the same lead as that of the cutter. In cutting helical gears, a twisting motion is imparted in the cutter as it reciprocates and rotates in harmony with the work.

Fig. 5—Internal gears are generated by using an operating arm extension, and rotating cutter and gear in the same direction. Feed per stroke of the cutter is controlled by change gears, driven from the main drive shaft

Fig. 6—Elevating mechanism applied to work-spindle enables twin cutter shown here to rough and finish generate a three-lobe hole in one operation; (A) shows the blank before and (B) after generating. In addition to electrical control, this machine is provided with an air cylinder operating a sleeve in the work-spindle in timed relationship to the cutter

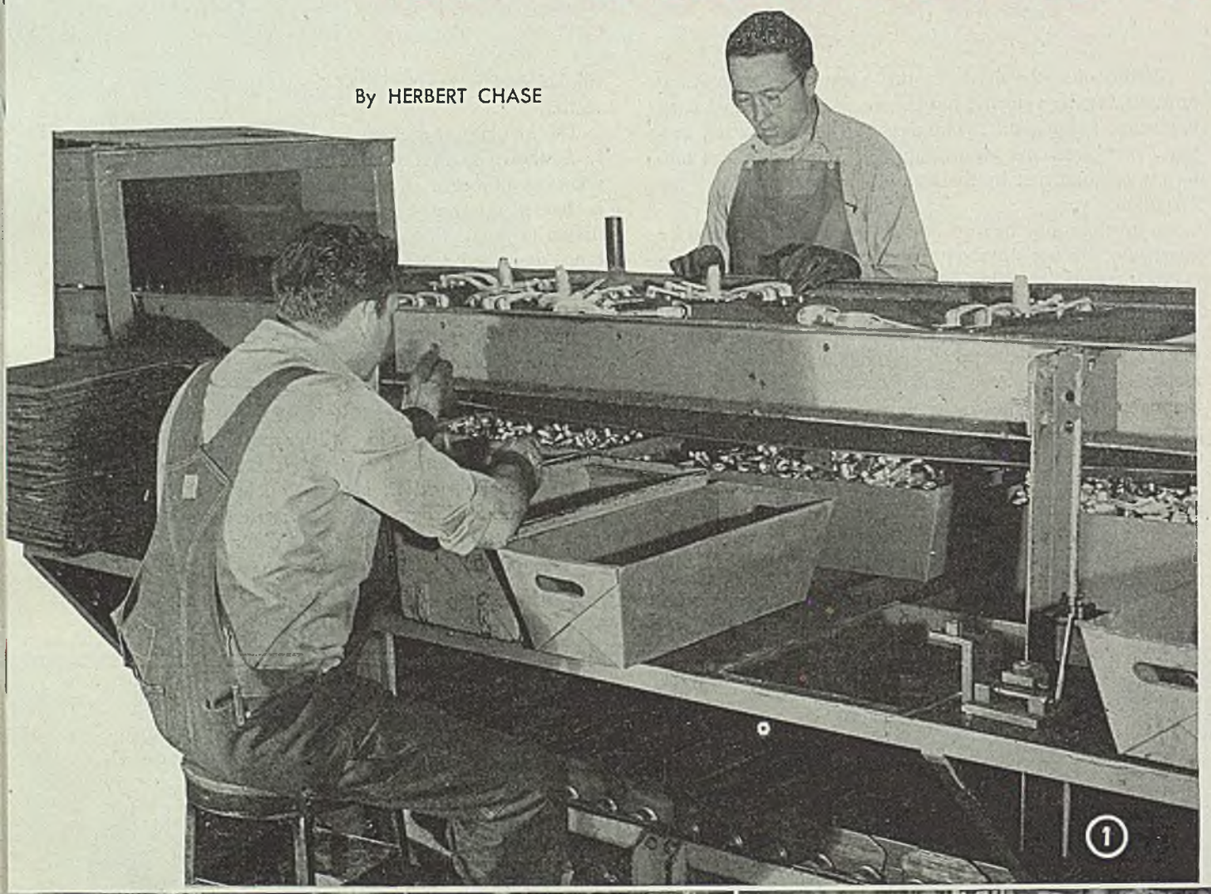
Fig. 7—The gear shaper in this case is equipped with rack-cutting attachment. Slide carrying the work is driven from the work-spindle. Work is finished in one cut, loading and unloading being done at each end of slide travel

Fig. 8—This special fixture is used for cutting face gears and clutches. Spindle carrying the work is located in horizontal position relative to cutter travel, and is driven by change gears. Attachment is of a universal type. Work-holding member can be adjusted both vertically and horizontally. It is adapted to cutting both on-center and off-center face gears

1,000,000 Pounds of Small Die Castings

By HERBERT CHASE

. . . for automobile hardware items are produced each month in one Ternstedt plant. All control methods are slanted for high surface smoothness to minimize polishing before the plating process



DIE CAST zinc alloy hardware is being produced on a large quantity basis at one of Fisher Body's Ternstedt plants in Detroit with many of the machines which formerly cast aluminum or magnesium war products. These machines have been equipped with furnaces and plunger-type injectors for handling zinc. Zinc is used because it is better adapted for hardware parts and for the subsequent plating that is required on a major proportion of the castings produced.

In this plant, 38 casting machines are in use and others are being added. All machines are supplied with molten metal from a battery of eight 5000 lb zinc furnaces. In addition, two tilting furnaces of 600 lb capacity are employed for melting the copper-aluminum hardener required in the No. 5 zinc die casting alloy now used exclusively.

Both the preparation of the alloy and its subsequent handling are subject to exacting control, not only as to chemical composition but as to certain physical properties. Such control helps to maintain the high quality that is essential on parts that are to be plated and must withstand severe exposure. An important aim is to maintain on such castings an exceedingly smooth surface that is free from blemishes and that requires a minimum of polishing and buffing to make ready for plating. Both virgin metal and virgin metal plus remelted sprues and runners are used in making castings.

About 1,000,000 lb of castings a month are turned out —to do this a total of about 2,500,000 lb of metal is melted. This comes about because castings are small and each gate commonly has about 1½ times as much metal in sprues, runners and other scrap as in the castings that pass inspection.

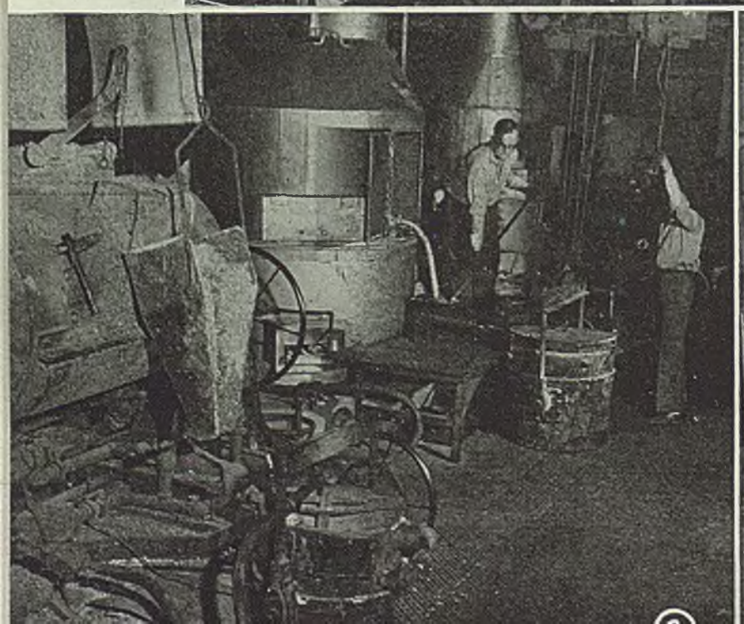
All virgin zinc slabs used are special high-purity (99.99 + per cent zinc) and this, together with exacting specifi-

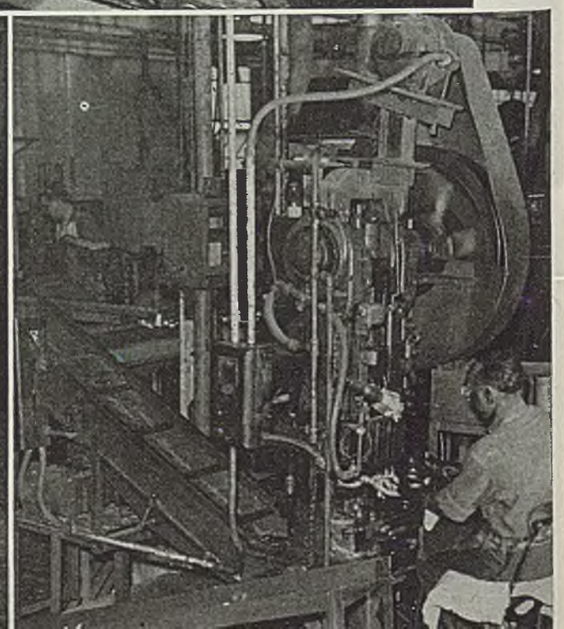
Fig. 1—Inspection station near end of a main belt conveyor. Inspectors break castings from gates and place good ones in tote boxes on the roller conveyor that forms a bench. Sprues, runner and rejects without inserts are thrown on plate conveyor below bench and return to melting pots

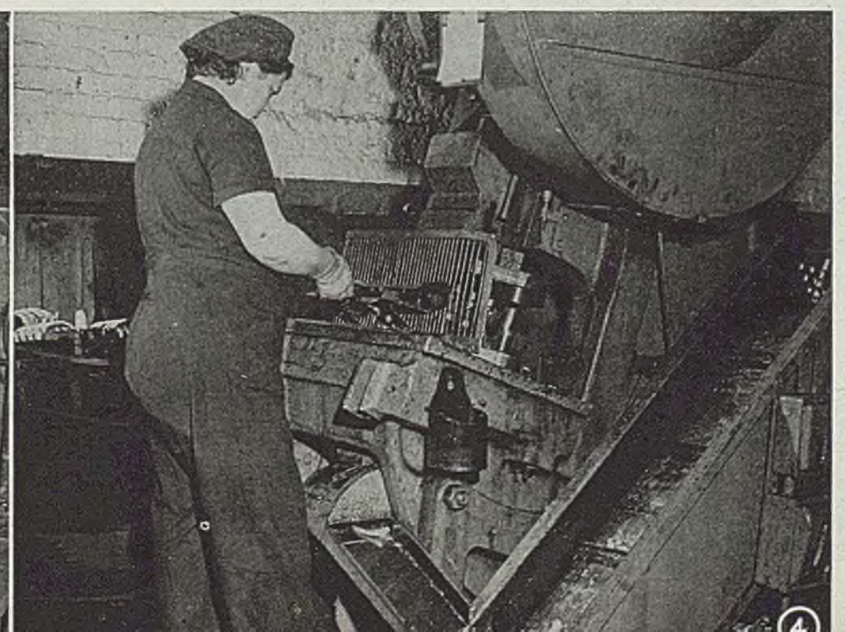
Fig. 2—Siphoning molten zinc alloy from one of the two 5000-lb melting furnaces, into trunnioned pot which is shifted to casting machine by a trolley hoist on a monorail. Left, foreground, is one of two tilting furnaces in which copper-aluminum hardener is melted

Fig. 3—Typical setup in which casting machine operator at right is removing a gate of castings from the die. Gate is water-quenched in tank next to press operator who then picks up the gate and inserts it in the trim die. Castings, pushed through the die by the punch, as the die sheers off flash, fall on the inclined belt and are discharged onto the horizontal belt, left background, which carries the castings to the inspection station

Fig. 4—Gates of castings reach this trim press on the conveyor back of operator from a casting machine beyond the wall. Trim die removes flash which is pushed off the die and falls into a chute back of press bed. Castings drop on a chute in foreground and are discharged into a tote pan near inclined cleated belt conveyor at right







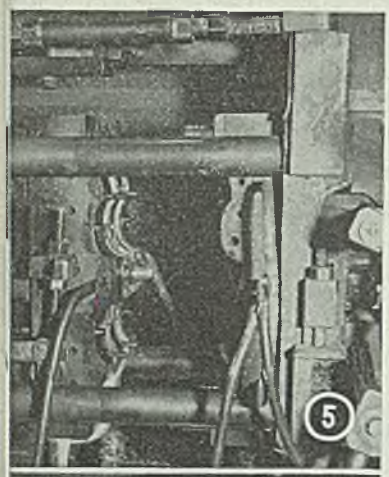


Fig. 5 — Multiple-cavity hardware die that has been coated with molten sodium dichromate to provide a somewhat heat insulating surface intended to reduce chill marks on the casting

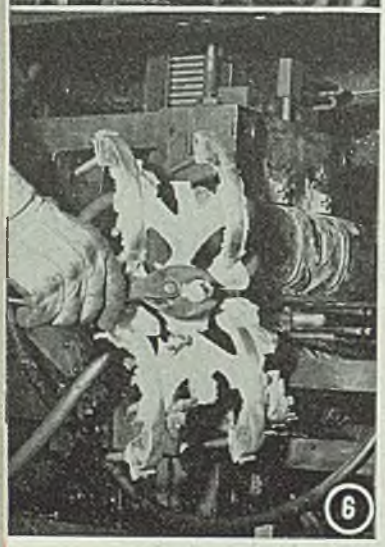
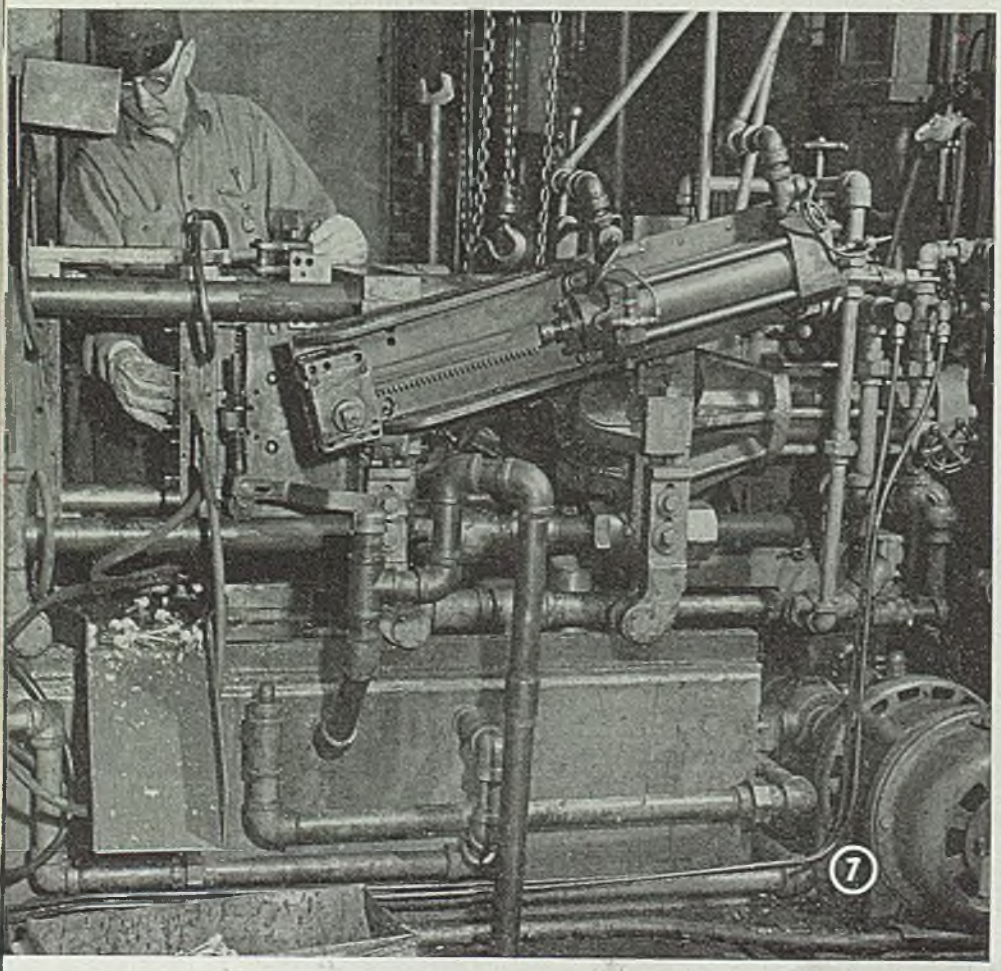


Fig. 6—Gate of four outside door handles being removed from the die in the background. Steel inserts forming shanks are fed into the die automatically from the magazine, a portion of which is seen above the die proper

Fig. 7 — Casting machine with die for casting worms on steel inserts forming the crank spindles of window regulators. Rack at side of die is operated by a hydraulic cylinder and engages a pinion on a shaft that unscrews the castings from the threaded sleeves inside of which they are cast. Castings thus ejected slide down the chute into a tote box



cations on the copper, aluminum and magnesium used in the hardener, insures that lead in the alloy is held below 0.007 per cent, cadmium below 0.005 per cent and tin below 0.002 per cent. Total of these impurities is held below 0.010 per cent. Magnesium is held between 0.02 and 0.05 per cent and iron below 0.10 per cent. Except for the tin impurity, which is held to even lower limits, these specifications agree well with ASTM.

Melting starts with a 2000 lb heel in the pot. To this is added 110 lb of molten hardener, prepared separately, and 2090 lb of zinc slabs. When reclaimed gates, sprues and scrapped castings are remelted, without adding virgin slabs, no addition of hardener is required. Melting continues until a temperature of 800° F is attained. Then deoxidizing flux is stirred in, the pot is skimmed after standing 5 to 10 min and test samples are taken. Later, the alloy is siphoned off into carrying buckets to be delivered to the casting machines.

Siphoning is done through a U-shaped elbow of 1-in. pipe supported at one end on a special ladle or capping holder. The elbow is filled by submersion in the alloy after which one end is dropped outside the pot and above a trough down which the alloy flows to the carrying bucket. The latter, supported on trunions, is set on the floor for filling and then is shifted by an electric trolley hoist on a monorail to fill holding pots at each casting machine. In each holding pot, the metal is kept at 800° F by thermostatic control of the gas fire.

Samples are taken from each pot melted and are submitted to the laboratory at least once daily from each pot. The laboratory uses a spectrograph to obtain complete chemical analysis. In addition, a shop laboratory makes a fluidity test and determines the solidification range of metal from each melt before the metal is syphoned into distributing pots.

Fluidity is determined by measuring the weight of molten alloy at 800° F ± 10° F that flows through an orifice 0.030-in. in diameter and 1-in. long, under a standard head, in 5 min. If the weight that flows in this time is less than 20 oz, reflexing of the melt is required. The solidification range is required to be within 715-750° F and is measured by a thermocouple immersed in a standard sample.

A recording potentiometer connected to the thermocouple draws a time-temperature graph on which the first and the major thermal arrests are indicated. If the range of these is outside the 715-750° F limits prescribed, the alloy is blended with a sufficient quantity of high-purity alloy or the aluminum content is adjusted to bring the alloy within the required solidification range.

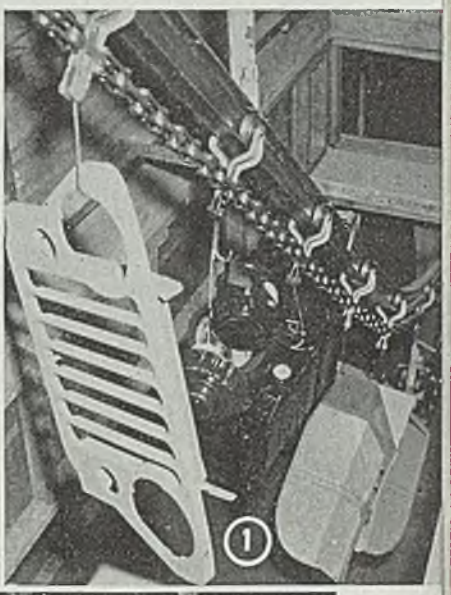
These fluidity and solidification tests, though not commonly made except in Ternstedt die casting plants, afford a close control over the condition of the metal to be cast and are

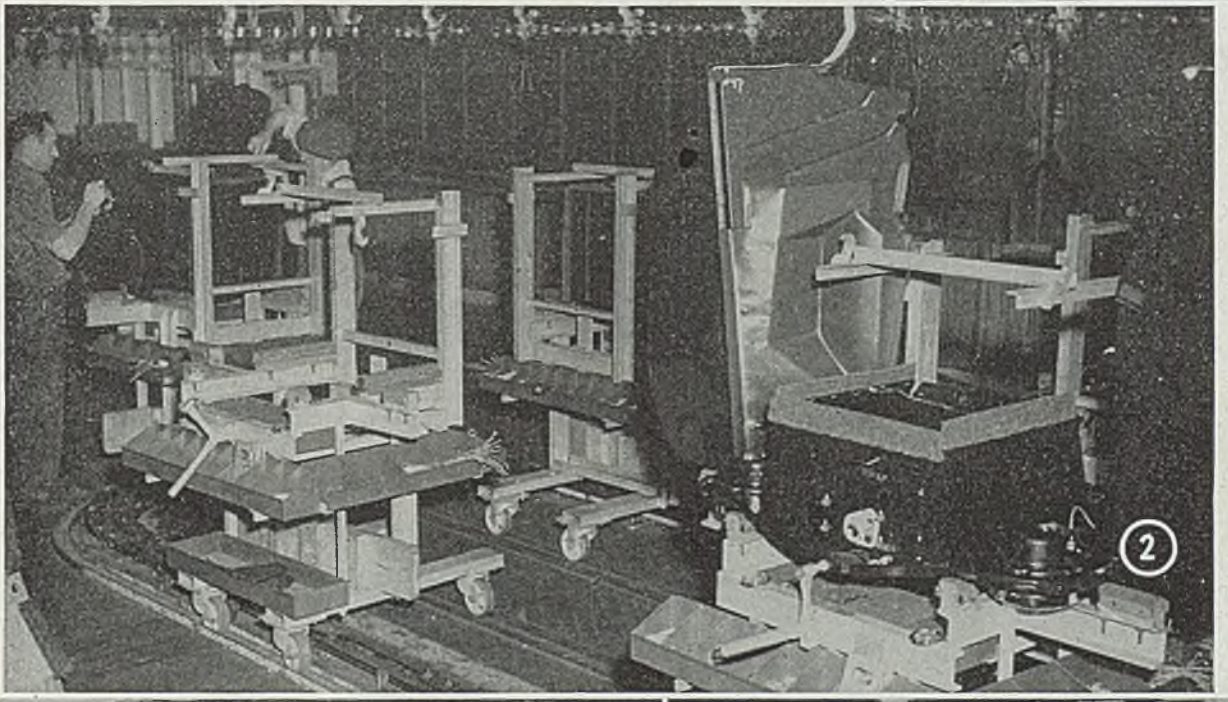
(*Please turn to Page* 99)

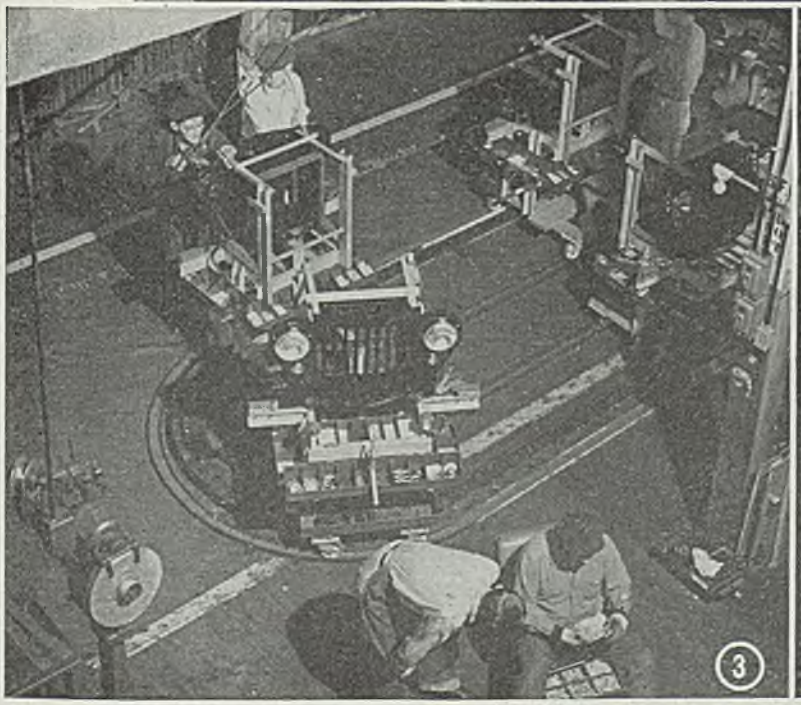
"Merry-Go-Round" System

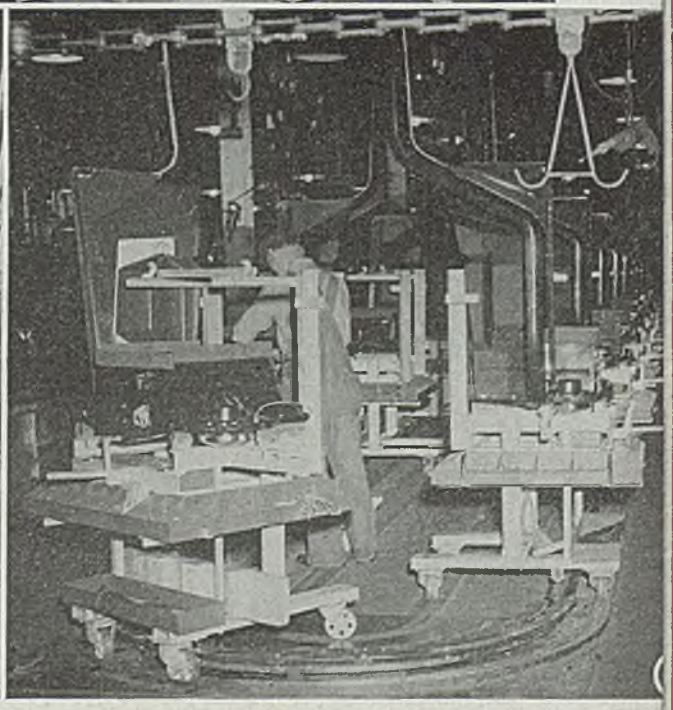
. . . feeds jeep front-ends to final assembly

FRONT-END assemblies for Willys-Overland jeeps are produced in the Toledo, O., plant on a "merry-go-'round" conveyor system provided with specially-built dollies riding on floor tracks and propelled around the circuit by a power chain. Each carrier mounts suitable fixtures in which the various elements in the assembly—side panels, air ventilators, headlights, radiators, radiator grille, etc.—can be positioned and bolted in place. The "merry-go-'round" adjoins the final assembly line, and stock is fed to it by an overhead chain conveyor as shown in the accompanying series of illustrations. Attachment of permanent stock boxes and bins to the traveling fixtures makes nuts, bolts, screws, clips and other small pieces required readily available to assembly workers.





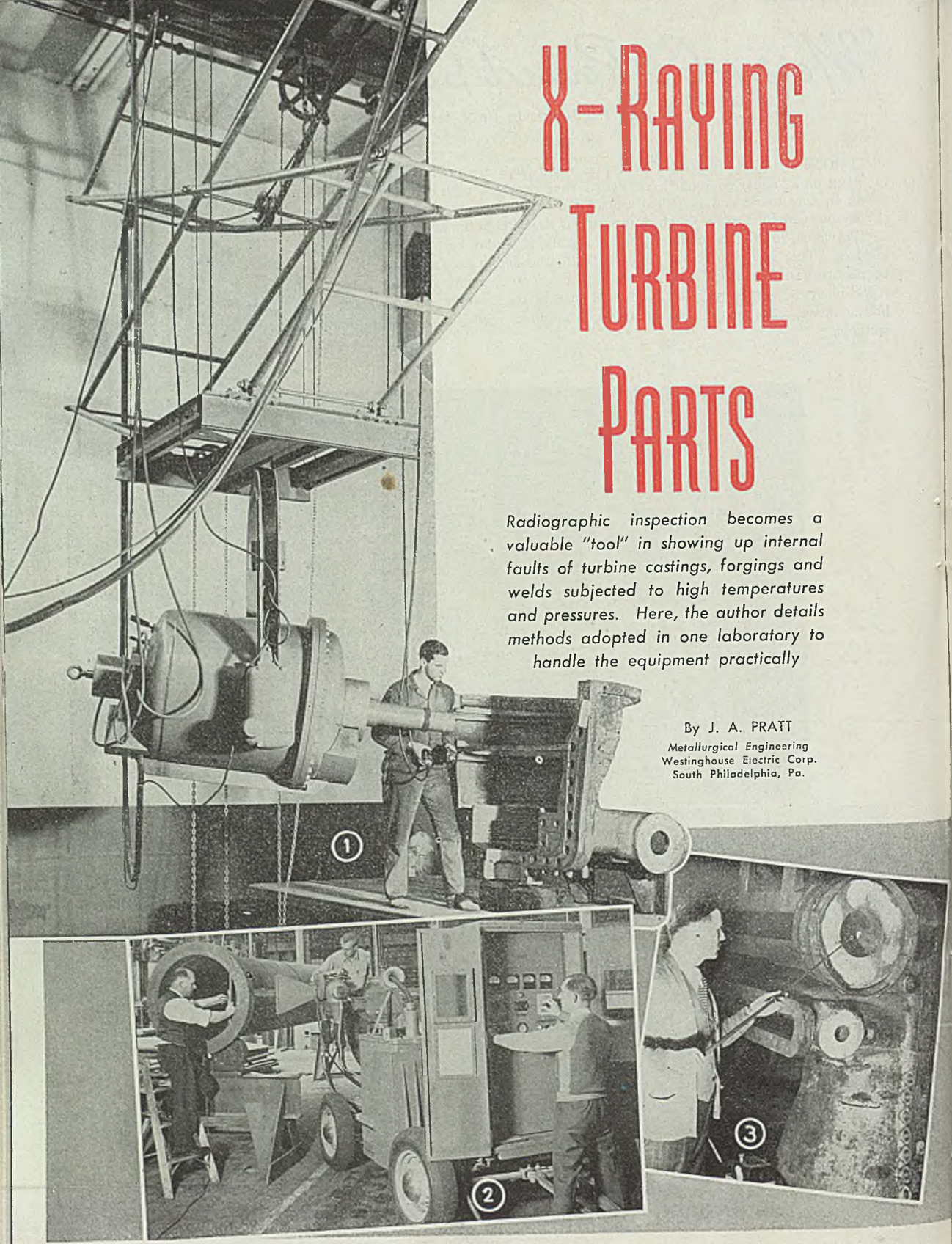




X-Raying Turbine Parts

Radiographic inspection becomes a valuable "tool" in showing up internal faults of turbine castings, forgings and welds subjected to high temperatures and pressures. Here, the author details methods adopted in one laboratory to handle the equipment practically

By J. A. PRATT
Metallurgical Engineering
Westinghouse Electric Corp.
South Philadelphia, Pa.



RADIOGRAPHIC examination is becoming a more and more necessary inspection tool for use by both the turbine manufacturer and foundryman due to the higher temperatures and pressures now being used in steam turbines. Castings, forgings, and welds making up present-day steam turbines are regularly subjected to radiographic examination to show up internal faults, and to determine whether the size, shape and location of these will affect the service and dependability of the finished product.

Demonstrating how valuable radiographic examination is shaping up as an inspection tool, is the new radiographic laboratory at the South Philadelphia works of Westinghouse. Here, three types of equipment are in use—a 1000 kv x-ray machine, a 220 kv x-ray machine and radium capsules. The first machine and capsules are housed in separate protective rooms to avoid interference. The 220 kv machine is a mobile unit housed in an enclosed area in the fabricating shop. Each type of equipment has its particular advantages for conducting an examination. In many cases they supplement each other.

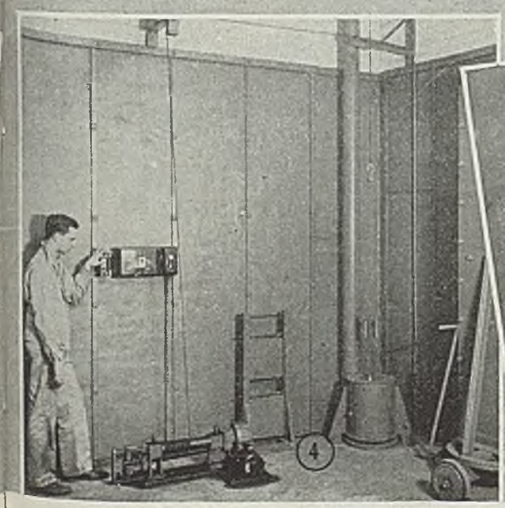
A large preparation area also is featured in the laboratory where work is made ready for inspection. It includes a dark room, a washing and drying room, a disposition room, an office and an air-conditioned film storage area. Through-the-wall film pass boxes are used for transferring film to and from the dark room into the preparation area. To provide a convenient method for processing film, a through-the-wall film fixing tank is installed between the dark room and the washing-drying room which are next to each other.

Work horse of the laboratory is the 1000 kv x-ray machine. It handles the greatest volume of work. In fact, it is preferred for the majority of work because of its ability to penetrate heavy thicknesses of steel in short periods of time; its flexibility in getting to the work, and the ease of operation. Throttle valve castings and turbine cylinder castings comprise the greater percentage of work scheduled for this unit. The castings are of such geometrical shape that all of the areas to be examined can be exposed to the 1000 kv x-rays.

The 1000 kv x-ray unit is housed in a thick concrete-walled room. A large concrete door weighing about 20 tons closes off the main work entrance into the room. Control panel is in a labyrinth room adjacent to the main room. The 1000 kv tube and transformer are supported by a pantograph hung from the trolley of a bridge crane. This provides great mobility and flexibility of the tube. It can be raised or lowered, rotated about its vertical axis and tipped through an arc of 180 degrees about its horizontal axis. The tube also can be moved across the room by moving the crane itself. This arrangement allows the tube to be aimed in most any direction and permits making more exposures without moving the work. Other equipment used in this room are two, 5 ft diameter turntables mounted 2 ft off the floor, a 25-ton motorized truck and a 5-ton motorized lifting crane mounted on the same rails as the 1000 kv tube crane.

Five radium capsules ranging from 500 mg to 25 mg in single capsules are housed in a lead-lined room at the other end of the laboratory from the 1000 kv room. The radium is stored in a heavy lead safe which is lowered 30 ft underground when not in use. The radium salt is stored in small hermetically sealed silver wafers or balls which are in turn placed in small aluminum capsules. The aluminum capsules have a cord attached to them to facilitate lifting them with a 6 ft fishing pole. This arrangement prevents personnel handling the radium from getting closer than 6 ft when carrying it to the work. Since the capsules are small and do not require large fixtures and equipment to support them in position, they can be used to make exposures in the tight places. In most cases a small ring stand is all that is necessary to set the radium for an exposure.

Radium continually emits the working gamma ray regardless of whether it is in use or in storage, thus it cannot be turned off and on like the 1000 kv x-ray machine. However, the intensity of the gamma rays is not as great per unit time as the intensity generated by the 1000 kv machine. Consequently it requires much longer time to complete an exposure. This is sometimes advantageous in that an exposure can be made (*Please turn to Page* 102)



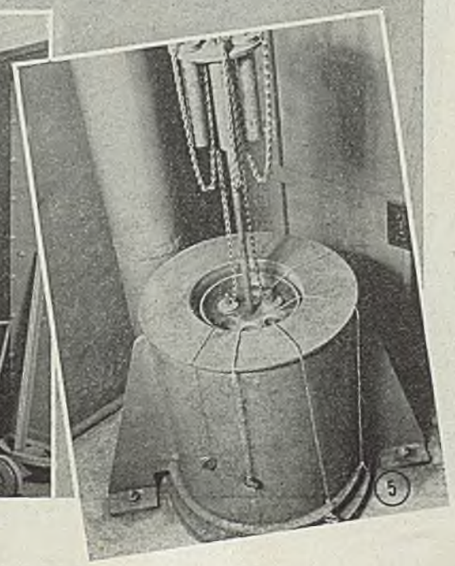


Fig. 1—Here operator is aiming the 1000 kv x-ray machine. Note pantograph and crane overhead used to mobilize the equipment

Fig. 2—The 220 kv mobile x-ray unit is shown here radiographing a long weld

Fig. 3—Typical radium setup

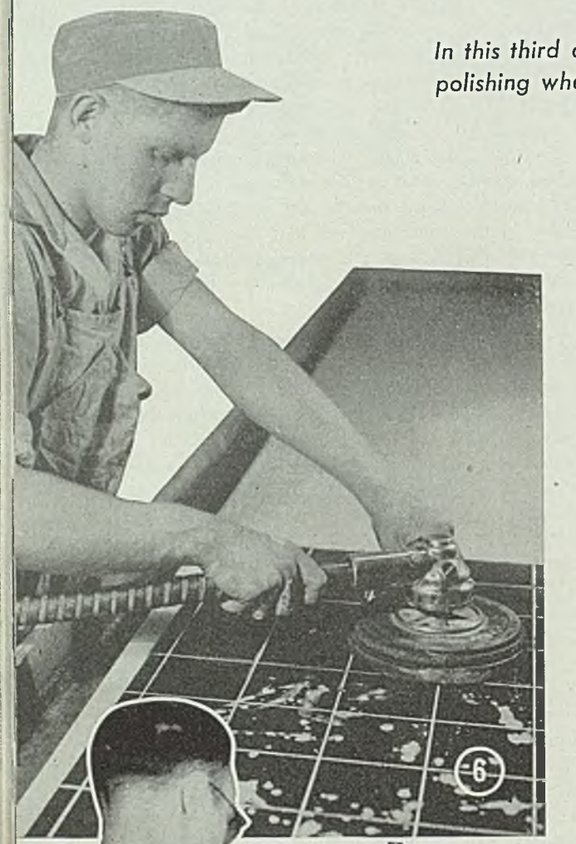
Fig. 4—Radium safe here is being raised from the 30-ft well where it is placed when radium is not in use

Fig. 5—View showing closeup of radium safe in open position. Note cords by which aluminum capsules containing radium are lifted from the safe

SUPPLEMENTARY EQUIPMENT FOR Buffing and Polishing

In this third article of the current series, the author describes polishing wheels other than setup types, polishing lathes and electric polishing motors

By JOHN E. HYLER



IN A plant using great numbers of polishing wheels, a wheel surface truing machine is desirable. This machine carries an abrasive wheel on one arbor and the polishing wheel on another. Both arbors are driven by a single flat belt passing over the pulley of a driving motor located above. The abrasive wheel for truing and the polishing wheel being trued can be adjusted so that different diameters of wheels can be dealt with.

A flexible face on a setup wheel is fully as important as a true face. It therefore is in order to "mellow up" the polishing wheel face before the wheel is put into service. This usually is done by striking across the face at closely-spaced intervals, and at an angle of about 45 degrees, with a heavy piece of hardwood such as a hammer handle, or with a piece of pipe. Go around the periphery twice. On the second circuit strike so that the 45-degree blows will cross those of the first circuit. This must be done while the wheel is held free in the hand. Never allow anyone to mellow up the face of the wheel mounted on a machine arbor. Damage will be done to the arbor of the polishing stand.

Wheels Other than Setup Types: Various means are employed for making up polishing wheels, other than setting abrasive on their faces with glue. Such wheels, while they will never displace setup wheels, nevertheless are useful for many purposes. One is the special type of cushion abrasive wheel whose periphery carries a strip of abrasive cloth. The cushion is vulcanized to the wheel proper. It flattens out at point of contact with work much like a mellowed setup wheel, though not so much.

Clips compressed on the ends of the cloth abrasive strips provide quick, secure clamping. These strips are furnished by the wheel manufacturers, cut to length and clipped. In plants using a large number of these wheels, an abrasive cloth cutting and clipping machine is desirable. This cuts the cloth and compresses it on clips under 5000 lb pressure, at the rate of about 300 strips per hour. Strips can be clamped to wheels in about 10 sec without removing wheel from machine arbor.

The wheel itself incorporates a lock-pawl arrangement. There is a gap in the periphery into which the two clipped ends of the abrasive strip are placed. Then, by means of a wrench furnished with the wheels, the strip is pulled snugly around wheel cushion and the ends locked into place. Faces ranging from 1 in. on wheels up to drums as wide as 44 in. are in service. Drums of this design are used for polishing stainless steel sheets and strip. Diameters range from 3 to 18 in.

In addition to cushioned and setup wheels, there have been developed types of polishing wheels made of various kinds of resilient materials impregnated with abrasive all the way through from periphery to core. As these wheels wear down they continually present a fresh abrasive face. The basic idea is the same as abrasive-charged rubber ink erasers. As a matter of fact one rubber company which specializes in making erasers offers soft rubber bonded abrasive wheels, blocks, sticks, rods and special shapes used for deburring finishing and polishing operations.

Working along similar lines, one manufacturer of polishing abrasives and related products developed abrasive-impregnated wheels of cotton fiber. These wheels are made up of thin disks, each one being thoroughly impregnated with abrasive before being bonded with others to build up required width of wheel face. These are made in five different hardness grades. The harder grades are used on jobs having the most severe "dressing action", so the wheel will wear at a rate no more rapid than is necessary to keep new, sharp abrasive presented to the work. They are made up in five different grits, namely, 50, 80, 120, 180, and 320. Wheels as small as ½-in. in diameter, with 1/16-in. face, may be obtained for extremely fine work; they range up to 12-in. diameter with 3-in. face.

Mounted wheels of this construction are in use in various places, especially in connection with portable tools. The same kind of laminated material in a similar selection of hardness grades and grits also can be had in sticks, ranging from ¼ to 1 in. square, and either 4 or 6 in. long. For breaking edges and removing burrs on all kinds of parts; for removing spurs from ends of automatic screw machine products; for smoothing (*Please turn to Page* 104)

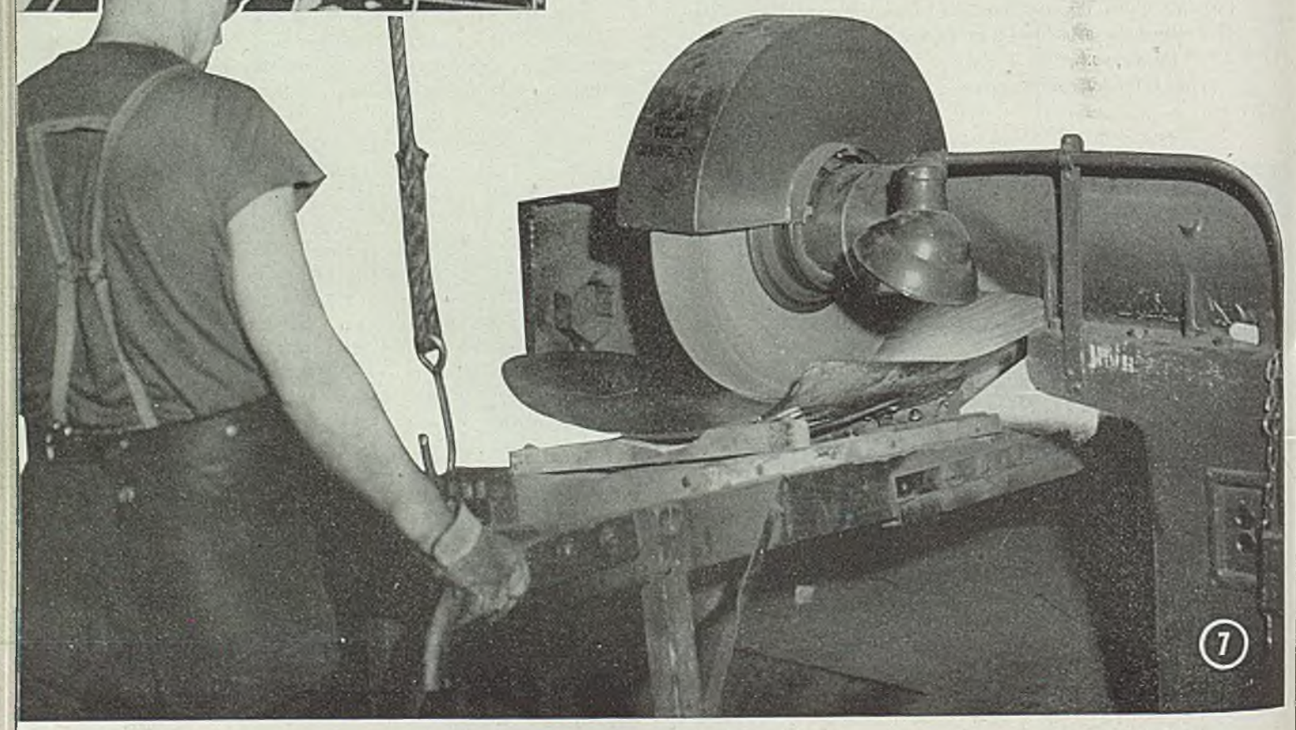


Fig. 6—Flexible shaft unit in operation finishing imitation wall tile. Courtesy R. G. Haskins Co.

Fig. 7—Plow blade polishing operation showing swinging type of framed support on which work is held. Courtesy Norton Co.

Fig. 8—Washers being polished prior to plating. Washer is slipped onto arbor and rotated against polishing wheel. Courtesy Norton Co.

Engineering News *at a Glance*

SNOW EATER: Answer to paralyzing snow falls and drifts that annually cause costly traffic tieups on railroads is supplied by Barber-Greene Co., Aurora, Ill., in form of a snow melter that literally eats snow and seems to have an insatiable appetite. The machine is hooked up in front of a locomotive and, instead of throwing the snow to one side, which simply clears one track to block another, it scoops up the snow, discharges it into a tank and digests it by turning it into water for easy disposal. According to "Nickel Steel Topics," melting is accomplished by dumping the snow directly into water heated to boiling point by steam injection. Idea of the machine originally came from Boston & Maine railroad, with the Aurora concern undertaking the task of developing it.

"PRESSURE OBSERVER": Motorists soon may be able to determine immediately if any one of their auto tires is losing air by a mere glance down at the dashboard. Tire Pressure Meter Co. of Harlingen, Texas, reports the development of a tire meter that warns drivers about soft tires. It consists of an electric switchbox equipped with five lights and buzzer, four of the lights being wired through to carbon brushes mounted on each of the four axles of the car. Each brush rides on a brass ring which is mounted on the inside of the brake drum to form the through electric current. The rings also are connected to buttons that rest inside the tire rims and press against the inner tube between the beads of the tire. Loss of pressure causes a signal to be transmitted through the brass plate to the carbon brush on the axle and from there to the dash. Result is a flash of light, indicating the tire affected, and a loud buzzing that stops only when turned off by the driver.

NEED ANY COPPER?: Compilation of major uses of copper and its alloys in a steam locomotive would make a list of over a hundred items, ranging from pipe and tube to valve parts, including the bell and ringer. According to a bulletin issued by the Copper & Brass Association, New York, amount of copper, brass and bronze incorporated in a steam locomotive varies from 2000 to 10,000 lb. The average is in the neighborhood of 4500 lb. Electric movers require a great deal more. An average electric locomotive contains about 30,000 lb of copper and its alloys, or about 10 lb per horsepower. One of the most powerful locomotives in the nation is the one-million-pound "super giant" electric unit built for the Virginian railway. This behemoth of the rails has a rating of 8000 horsepower, 6800 of which will be available continuously for driving power. It contains 54,000 lb of copper and its alloys, or an average of 8 lb per horsepower.

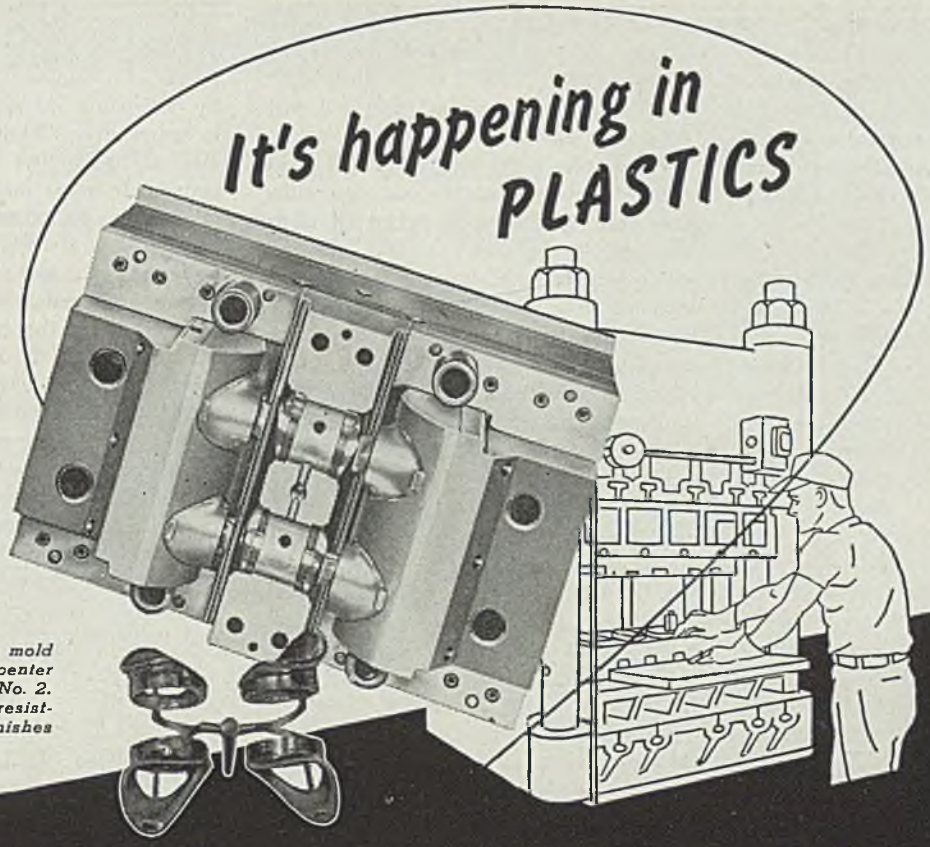
DEEP HEATING: Reverse-cycle heat pumps employing water from 200-ft wells as the heat source are being installed in five homes this winter in Chattanooga, Tenn., according to "Air Conditioning and Refrigeration News". A water temperature of 58° F is circulated during the winter months. This will serve to evaporate the refrigerant of an air conditioning system operating on the reverse cycle. Engineers estimate power requirements will be only one-fourth of that required to heat homes by radiant electric heaters. Installation is part of a program to determine the practicability of reverse-cycle systems for year-around home air-conditioning in this area.

FORESIGHT: Period of indoctrination to handle special engineering needs should be provided in future emergency industrial-mobilization planning. In the aircraft industry, for example, several types of engineering resources are required. While aircraft design represents only 7½ per cent of the total engineering effort, it requires engineers whose professional experience is so specialized that they cannot be trained in time of emergency, and must necessarily be part of peacetime aircraft industrial establishment. J. Carlton Ward Jr., Fairchild Engine & Airplane Corp. president, states in "Mechanical Engineering" that this 7½ per cent is the group engaged in completing the prototype which, added to the design engineering group, constitutes 20 per cent of the total engineering effort. Engineering changes and production engineering, representing 15 and 40 per cent respectively, can draw on other ranks of engineers to swell the working forces. Similarly, tool development, accounting for the remaining 25 per cent, can draw heavily on high-production industries. Nevertheless, all these activities are peculiar to aircraft engineering, and a period of indoctrination must be allowed the individual engineer.

KILOWATTS PLUS: Nation's electric power generating capacity will be increased by more than 3,500,000 kw within the next 2 years, General Electric Co., Schenectady, N. Y., reports, when installation of steam turbine generators now on order are built. Added equipment will raise the capacity of steam turbine generating plants in the U. S. to over 37,000,000 kw, a new high. An additional output of nearly 15,000,000 kw is currently produced by hydroelectric stations. Turbines now produced, according to C. S. Coggeshall, manager of the turbine division, incorporate design changes that greatly increase efficiency and reliability. During World War II, he said, power companies, by adopting modern steam turbines and power plant equipment, developed six times the amount of power with only twice the amount of coal consumed during World War I.

STRAY CURRENT GUIDER: Conservatively, it is estimated that preventable electrolysis causes more than $50,000,000 damage annually in the U. S. in oil, gas and water industries alone. In Chicago, Cook Research Laboratories, working on the problem, recently developed a stray current control system to combat the situation. Electrolysis occurs when stray current in pipe lines seeks to escape through surrounding soil. In so doing, it touches off a reaction in which metal from the pipe is removed. This condition is especially severe in areas where there is an overhead trolley wire or third rail, and car tracks are used as a return circuit. The new system, a current and voltage-sensitive device operating jointly on a high current contactor, serves to guide the current so that it is not trapped in the soil surrounding the pipe but made to travel on harmlessly. Contactor of the system closes when stray current tends to leave the pipe, thereby connecting pipe and rail with a metallic bond to keep the current flowing. Conversely, it opens if the current attempts to flow from the rail to the pipe.

WATCH PENETRATION!: Important single consideration when metallic arc welding with the electrode, Amco-Trode, is to keep penetration at a minimum, the manufacturer, Ampco Metal Inc., Milwaukee, reports. Unless this is done, the welder may find himself in trouble because he has so diluted the aluminum bronze that he has changed completely the physical and chemical characteristics of the alloy. Excessive pickup of the base metal, particularly in the case of cast iron, may result in a weld deposit so hard that it is practically unmachinable. Penetration can be kept to a minimum by manipulating the electrode so all metal transfer is deposited in the molten puddle of aluminum bronze and not on the bare parent metal. Heat of the arc thus is



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passed through the deposited metal to the base metal, thereby bringing the base metal up to a suitable temperature for the weld-brazing action required—without permitting the arc to "dig in" and dilute the deposit with "pickup" from the parent metal.

CENTRALIZES POWER: Ninety per cent of present engine-powered, truck-mounted machinery, requiring 10 to 100 hp for its operation, can be driven directly and efficiently from the trucks' own engines through power take-offs according to Davey Compressor Co., Kent, O. Thus the company's newly-created truck equipment division is assuming the responsibility of contacting truck and equipment manufacturers to acquaint them with possibilities of employing take-offs. As its basic principle, the Davey unit uses an internal and external gear drive operating as a spline. Installation is made at rear of the truck transmission case, the take-off becoming an integral part of the drive shaft assembly. Large scale production of 1947 units is expected to get underway soon, involving eight standard models in capacities of 50, 75 and 100 hp.

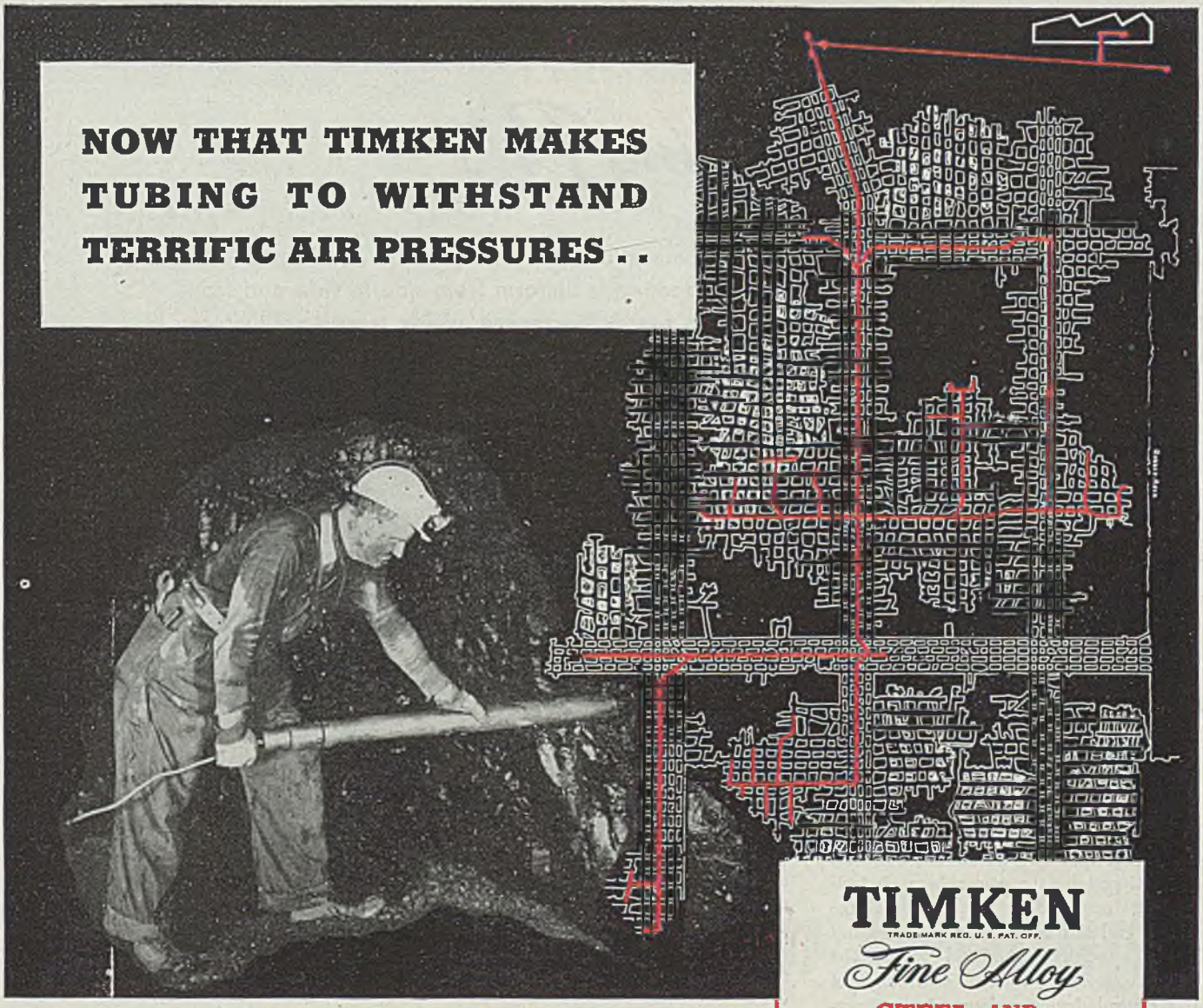
"LOOKING" THROUGH STEEL: Designed originally for basic research, the millionth of a second x-ray machine such as the one produced by Westinghouse, is moving right into the practical end of factory operation. It saves a tremendous amount of time along the production line. Differing from the doctor's x-ray apparatus, the machine is mounted on wheels and can be brought right to the scene of the trouble. It can look right through an inch of steel and tell just what each hidden machine part is doing. For example, quite often a punch press will be working smoothly and then without warning the stock begins to sieze and gall in the dies. A deep drawing press may take minutes to set up and again it may take hours. Forging dies may be perfectly designed, yet the hot metal may refuse to flow in them. Such situations usually are solved by mechanical intuition, a process that is as costly as it is unpredictable. But the high-speed x-ray will look through the steel dies, as if they were glass, and show quickly just what the troubles are.

GI TRAINING: Marion Power Shovel Co., Marion, O., recently won state and national recognition for the GI on-the-job training program it inaugurated last July. As of Oct. 1, the Marion program was described as the largest in Ohio. To date, 110 men have taken a preliminary 30-day period of related training at the local vocational high school and passed on to later phases of the program at the company's plant. This number includes 30 physically handicapped vets. USES, which gave valuable assistance in organizing the training procedure, distributed a full report of the program to its 1800 offices throughout the nation for use as a possible pattern in other plants.

GOLIATH OF THE RAILS: To be used for hauling freight in mountainous sections, the new streamlined 8000-hp diesel-electric locomotive recently delivered to Kansas City Southern lines by Fairbanks Morse & Co., Chicago, measures over 259 ft long, and weighs with all its supplies about 1 1/3 million pounds. It has a maximum speed of 68 mph, and is composed of four units, each powered by a 2000-hp 10-cylinder opposed-piston diesel engine. In this type engine, combustion takes place between two pistons in the center of a cylinder with open ends. Two crankshafts are involved. These are connected by a vertical shaft and bevel gears which transmit power from the upper to the lower shaft, and maintain proper timing between the upper and lower pistons. With two pistons per cylinder, each 10-cylinder engine is, in reality, a 20-cylinder unit. The road locomotive is designed for double-end operation with a cab at each end to permit cutting off one train and coupling immediately to one going in the opposite direction without turning.

GUARANTEED DELIVERY: During the brief rail embargo, now lifted, Vascoloy-Ramet Corp., North Chicago, Ill., planned to initiate a program of "personalized delivery" to insure transit of cemented carbides to manufacturers who might have been faced with a production lag due to the lack of carbide tool shipments. According to H. B. Clark, general manager, the company was determined to supply customer needs and to exhaust every effort to deliver the tools on schedule, even though it meant diverting a major portion of the company's effort toward the task of delivering carbides.

"INTERMEDIATE OUTFIT" shown here, which eliminates slow and costly hand labor on small scale jobs, is the latest contribution to the postwar market by Milwaukee Hydraulics Corp., Milwaukee. It is a radically new development in the crane-excavator industry employing full hydraulic control for every operation. Simple hydraulic system is used to operate boom, hoist, swing and even the clamshell bucket. Tubular boom raises and lowers as well as telescopes from 16 to 22 ft, enabling operator to spot loads quickly into box cars, over walls, between beams or into buildings. Unit is designed to be mounted on a 1½-ton truck or 6 x 6 drive jeep. Stability is assured by means of hydraulically powered outriggers that are independently extended or retracted in 3 to 5 sec from the operator's seat. The company reports it is planning to distribute the development nationally, and distributor appointments are now in process.



—safety and production in coal mining reach a new high!

Since Cardox Corporation developed the new "Airdox" method of breaking out coal with compressed air this new system is coming into wider use. Besides eliminating explosives, the new method in some cases has raised production to 1000 tons of coal per eight hour shift for each compressor installed.

Timken Alloy Steel Seamless Tubing, capable of safely withstanding up to 20,000 pounds air pressure per square inch, helped make this new method possible.

In the "Airdox" method, electrically driven automatic air compressors send great volumes of air at high pressure down through the mine to the working sections. Timken Tubing, free of mechanical defects, easily stands the normal air pressure of 10,000 pounds per square inch, and the repeated stresses of pressure variations over great distances.

Flexible copper tubing carries the air short distances from the Timken steel tubing through various mine cross-cuts to "Airdox" tubes. These are inserted in drilled holes in the working faces. The operator fills up and discharges "Airdox" tubes in approximately one minute by merely turning a blow-down valve. Each discharge releases approximately 230 cubic feet of air at 10,000 pounds per square foot, and dislodges from 5 to 7 tons of coal.

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* *YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH*

Air-Fuel Ratio Controls

By L. E. BROWNE
Associate Editor, STEEL
New York

Oil-Fired Soaking Pits

Introduction of products of combustion into pits blankets ingots with controlled neutral atmosphere. Heating is uniform from side to side and from front to rear, eliminating hot spots. Increased yields traced to uniform temperature and decreased scaling

ELIMINATING checkers, regenerators and recuperators, the Stanley Works, American Tube & Stamping Plant, Bridgeport, Conn., is completing installation of a final battery of air-fuel ratio controlled oil-fired soaking pits, replacing gas after attaining high degree uniformity in temperature control and fuel economies with earlier installations. By introducing the products of combustion into the pit rather than elements of combustion, or heat rather than burning fuel, controlled neutral atmosphere surrounding the ingots is maintained at all times.

Basic operating features are the Urquhart furnace atmosphere control and low-velocity burner. The burner combines fuel and air, which are correctly proportioned by the atmosphere control; causing combustion to begin at the burner end of the combustion tunnel and be substantially completed within the tunnel. Because of the sensitivity of this control device, a low-pressure gravity feed from a constant-level tank provides fuel to burners through the furnace atmosphere control, maintaining constant fuel pressure on the burners.

For the atomization of fuel, compressed air is used; about 24 cfm of free air is required at 70 psi pressure to operate the burner at maximum capacity. The burner by necessity works against the pressure in the pit and must produce a flame of low velocity. Design and construction of the furnace atmosphere control permits any desired ratio of air and fuel in any given volume. The mixture can be richer at any particular point in the range of turndown, if deemed advisable, or exactly the same ratio can be maintained throughout the range.

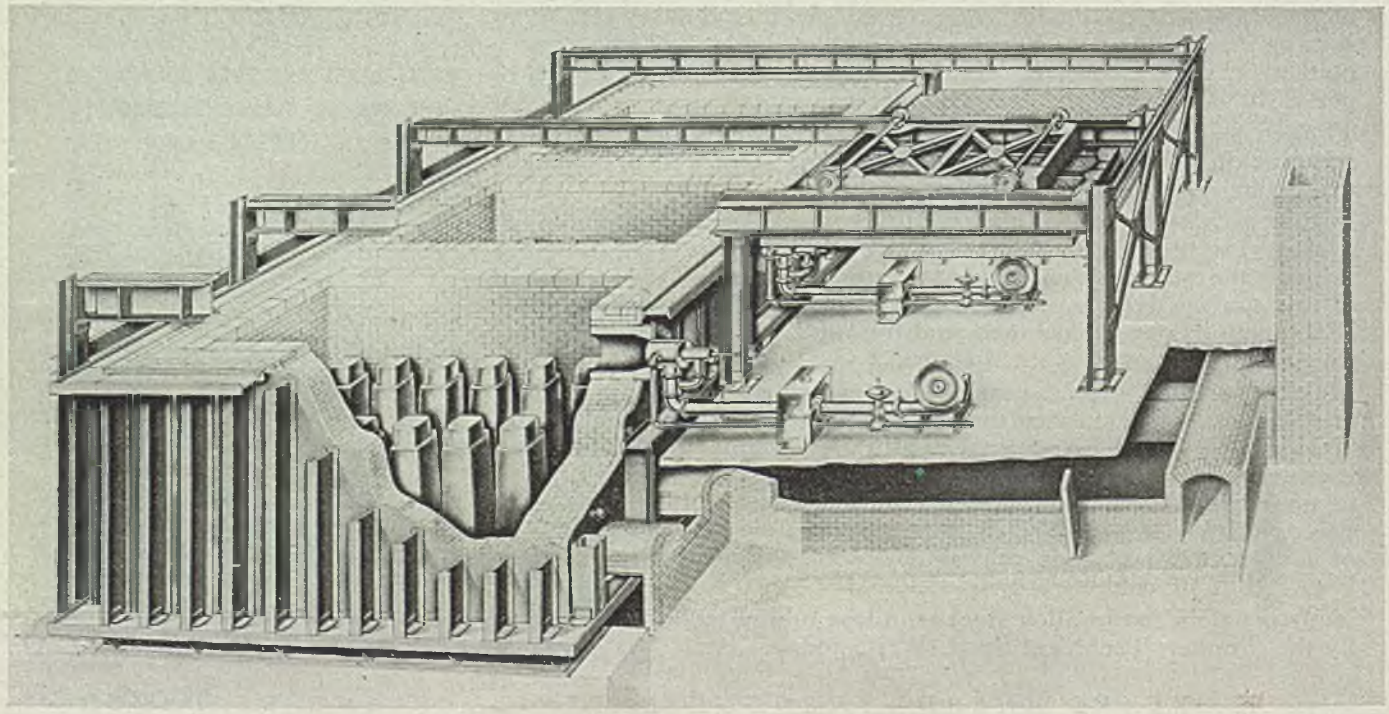
Steel Processing Co., subsidiary of Fort Pitt Bridge Works, Pittsburgh, is installing three Urquhart combustion process pits at the Stanley Works, replacing the last four producer gas-fired units. Installations in all will replace eight former producer gas-fired regenerative and two producer gas-fired recuperative pits which have been already converted to burn bunker C oil.

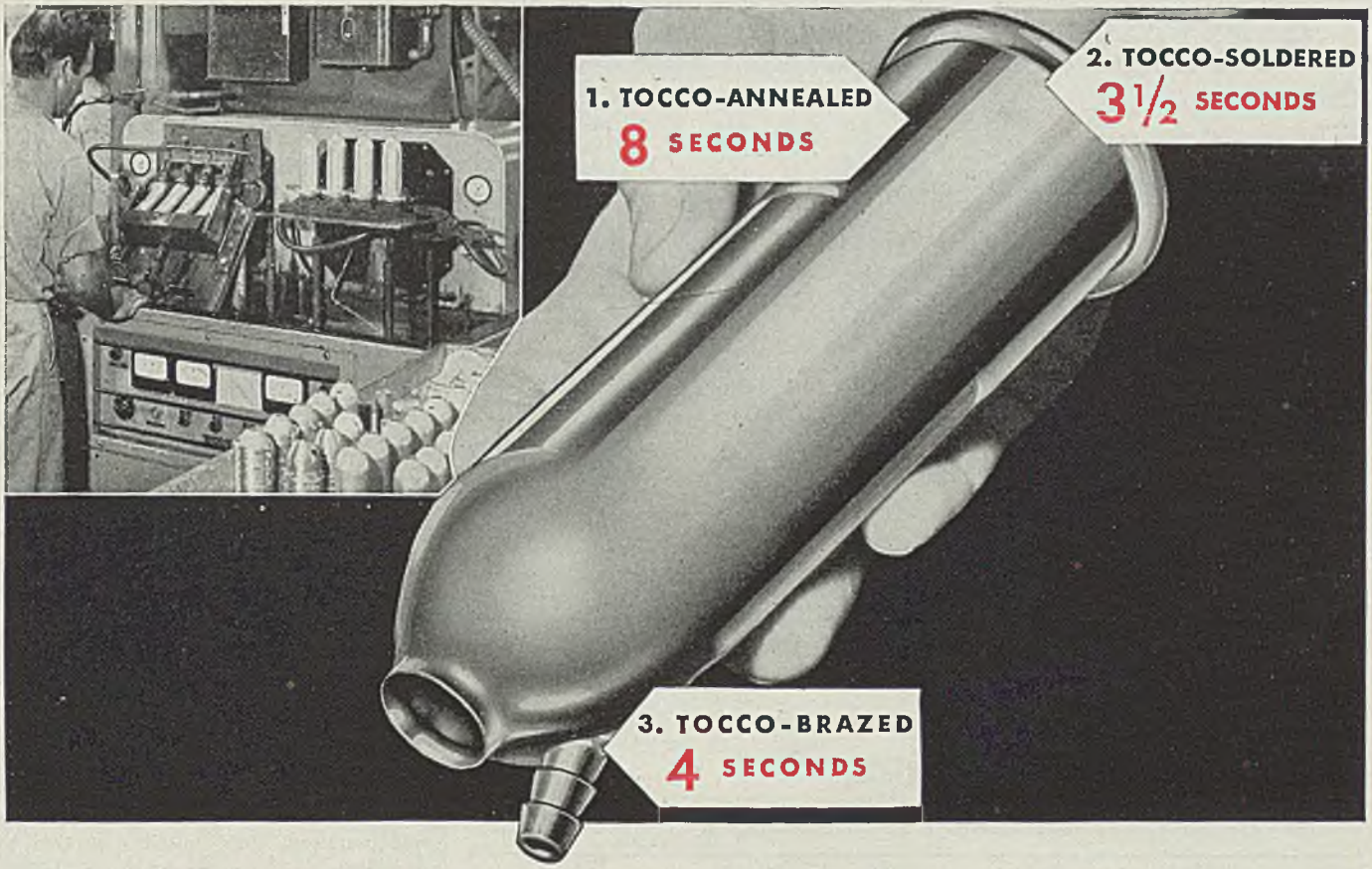
Application of the combustion process to these pits, approximately 5 x 10-ft, consists principally in deepening them and sealing off all present flue openings, eliminating checkers and recuperators, construction of burner tunnels and two small flues in one endwall.

Blower, furnace atmosphere control and burner, fuel oil supply and connection flues to stacks are installed. The new battery, which will complete conversion to bunker C oil for fuel, includes one single and one double pit 6 ft 5 in. wide by 15 ft 8 in. long and 9 ft 4¾ in. deep with normal capacity of 12 three-ton ingots each. When reconversion is complete six 12-ingot pits will replace eight 8-ingot units at Stanley Works, and occupy the same area.

The combustion process requires a

Cutaway section of new type soaking pits which operate under controlled neutral atmosphere





The SPEED way to lower costs ...TOCCO Induction Heating

IN the production of 18-8 stainless steel teat cups, Solar Aircraft Co., Des Moines, Iowa, reports these benefits from TOCCO Induction Heating:

SPEEDY HEATING. This localized process performs these operations speedily . . . for *lower costs:* (1) Heats upper end to 1950° F. in 8 seconds . . . anneals it for shaping end flange. (2) Heats upper end to 400° F. . . . 4 at a time in 14 seconds . . . to solder-fill curled flange. (3) Heats nipple connection to 1100° F. . . . 4 at a time in 16 seconds . . . to silver solder nipple to cup.

SPEEDY HANDLING. Cool, clean, compact, TOCCO machine is located in production line handy to related operations. Minimizes haulage . . . for *lower costs.*

SPEEDY PRODUCTION. In addition, TOCCO eliminates scale formation and distortion, minimizing cleaning and avoiding straightening . . . for *lower costs.*

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TABLE I

FUEL DATA FOR JUNE 1946 COVERING SIX SOAKING PITS USING COMBUSTION PROCESS

Pit No.	1	2	3	4	9	10
			Hot Steel			
Tons	408	318	249	231	375	258
Oil	2358	1867	1880	1705	2412	2008
Gal/ton	5.8	5.9	7.6	7.4	6.4	7.8
Per cent	31.1	26.2	24.4	27.5	34.7	26.0
			Red Steel			
Tons	195	180	138	153	141	105
Oil	1377	1193	1101	1277	1134	920
Gal/ton	7.1	6.6	8.0	8.4	8.1	8.8
Per cent	14.9	14.8	13.5	18.2	13.1	10.6
			Black Steel			
Tons	123	48	30	...	...	33
Oil	1197	349	435	...	...	437
Gal/ton	9.7	7.3	14.5	...	...	13.2
Per cent	9.4	3.9	2.9	...	...	3.3
			Cold Steel			
Tons	159	216	126	96	111	168
Oil	2189	2888	1512	1216	1768	2456
Gal/ton	13.8	13.4	12.0	12.7	15.9	14.6
Per cent	12.1	17.8	12.4	11.5	10.3	16.9
			Hold & Light-Up Period			
Tons	426	453	477	360	453	429
Oil	6705	6661	7938	5340	8294	6981
Gal/ton	15.7	14.7	16.6	14.8	18.3	16.3
Per cent	32.5	37.3	46.8	42.8	41.9	43.2
			Total for June			
Tons	1311	1215	1020	840	1080	993
Oil	13826	12958	12866	9538	13608	12802
Gal/ton	10.5	10.7	12.6	11.4	12.6	12.9

Total ingots rolled, tons: 6459 — Fuel oil used, gal: 75,598 — Fuel oil, gal/ton: 11.7

TABLE II

TOTAL PRODUCTION OF FOUR OIL-FIRED SOAKING PITS

Pit No.	10	9	4	1
No. weeks production	10	2	33	16
Total tons rolled	2,586	645	7,637	4,911
Oil used, gal.	28,772	6,281	91,230	53,581

Total ingots rolled, tons: 15,779 — Fuel oil used, gal: 179,864 — Fuel oil, gal/ton: 11.4*

* Number of gallons taken in these reports is read at approximately 200°F. Allowing 5 per cent less for reading at 60°F. due to expansion the overall oil consumption would be 10.8 gal/ton.

rather simple installation—a rectangular chamber with a single burner port in the center of one endwall, firing over top of the ingots. The propagated flame, which does not impinge on the ingots, exhausts through two ports in lower corners of the same wall. While bunker C oil is employed at Stanley Works, other gaseous or liquid fuels can be used with the same equipment.

No secondary combustion is provided on ingot side surfaces or on pit walls. Ingots heat evenly from side to side and from front to rear with consequent elimination of hot spots due to impingement of exploding fuel. Also eliminated are hot layers due to oxygen stratification.

Pit is operated under pressure at all times thus obviating the necessity for a large stack to provide draft. In the Stanley Works installation use is made of an existing stack with damper controls to insure an even pressure on all flues with reserve capacity of the stack available for quickly purging pits if necessary. Ingots are leaned against walls and only a minimum of bottom-making is required, consisting of 1-in. dolomite and 1-in. coke breeze.

Covers are of tight-sealing construction. After operating several months with earlier installations Stanley Works has attained high-quality output with increased economy in soaking pit practice.

Soaking time approximates that of former gas-fired pits, the Stanley Works being influenced in adopting the new process by superior quality of heating, notably from side to side and top to bottom, together with lower costs in refractory maintenance, bottom-making and low fuel consumption.

Control equipment includes for each hole a 2-point Leeds & Northrup model R Micromax indicating and recording controller of radiation type, recording two graphs on one chart, one top pit temperature and the second bottom-pit detected by two Rayotubes. Control is of 2-position type and so arranged that top-pit temperature is maintained at a predetermined maximum until the bottom-pit temperature reaches its control point at which time pit temperature is controlled from the bottom temperature point. The heater, with a visual record, readily determines when the pit is due for drawing by the bottom line on the chart. The temperature control also controls the motor turning the shaft in the furnace atmosphere control.

Stack draft control maintains constant stack pull. This instrument is controlled by a draft regulator of mechanical pressure bell balanced type.

Operating records at Stanley Works for a typical month, June of this year, covering six pits (Table 1) show 6459 tons of ingots rolled and 75,598 gal of fuel used or 11.7 gal per ton. It will be noted that for most of these soaking pits better than half was cold steel or hold and light-up period tonnage, which is due to the fact that mill operated two 8-hour turns per day, five days per week, an intermittent mill operation.

The best record by one pit, No. 1, was a consumption of 10.5 gal per ton of ingot, or 1311 tons with 13,826 gal and of this total 31.1 per cent was hot steel, 14.9 red steel, 9.4 black steel, 12.1 cold steel, and 32.5 hold and light-up period steel.

Soaking pit production for four units, covering from two to 33 weeks, was a total of 15,779 tons of ingots with a fuel consumption of 11.4 gal per ton (Table II). Number of gallons on which these data are based is read at approximately 200° F, and, allowing for 5 per cent less for reading at 60° F due to expansion, oil consumption for all pits in operation since conversion to oil and the Urquhart process up to this time would be 10.8 gal per ton. The Btu content of the oil is approximately 150,000 per gal.

Scarfing and chipping have been reduced and, with washed and burned ingots eliminated, rejections are down. Uniform heating and decreased scale loss have increased yields; all reversing mechanism is eliminated and space is saved as no regenerators or recuperators are required. Low initial cost due to simplicity of construction is also a factor.

Booklet Discusses High Tensile Steel

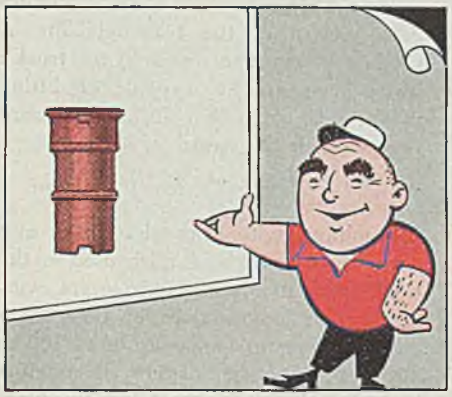
Properties of U. S. S. Cor-Ten, a high tensile strength steel produced by United States Steel Corp., Pittsburgh, are discussed in a new 68-page booklet issued by that organization. Its first section covers various properties of the steel, including its high resistance to atmospheric corrosion, and outlines how they may be used. Fabrication by standard practices, including five pages on welding, is included in the second section.

Remainder of the booklet deals with applications of the steel in various fields, such as railroad freight and passenger equipment, materials handling, marine and public transportation equipment uses. Test data, together with charts and illustrations are interspersed in the booklet.

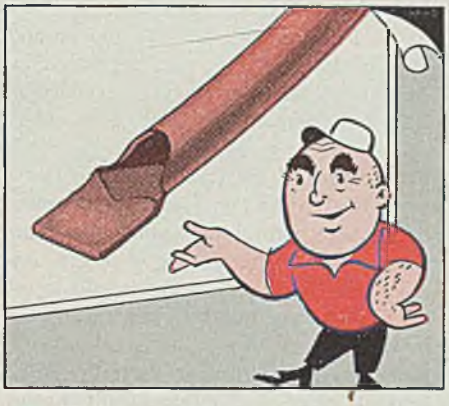
Flux-Filled Rivet Stud Announced

Appearing much like a hollow rivet, except that the base is flux-filled, a new "rivet" stud introduced by Nelson Sales Co., Lorain, O., is designed for automatic welding with either manual or production type Nelson stud welders. Intended for securing a wide range of materials to metal surfaces, the rivet studs are made in diameters from 3/16 to 3/8-in. and in any length to 8 in.

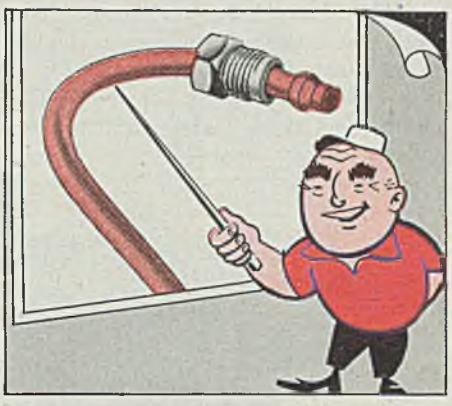
Six pages from Bundyweld's folio on easy fabrication



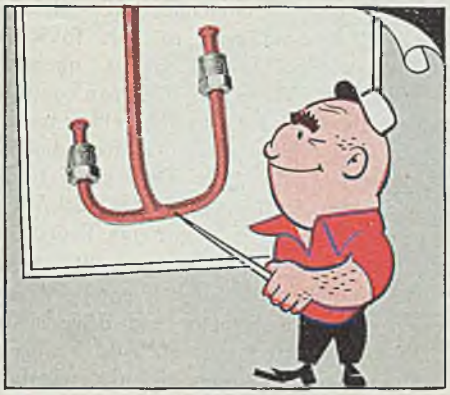
1 Double upsetting, flanging, expanding and notching are all accomplished with ease, as this small piece of Bundyweld Steel Tubing shows.



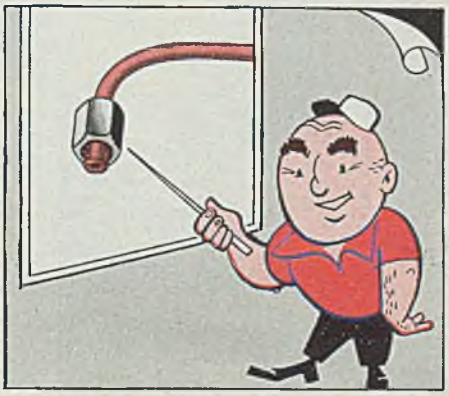
2 Slick as a whistle, that's how simple it is to notch and flatten the end of a length of this unique, outstanding steel tubing.



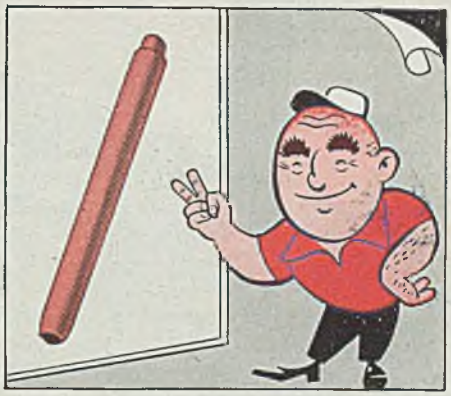
3 Short radius bends are no problem at all, and there's little or no flattening on the curves. Compression fittings work well, too.



4 Here's proof that Bundyweld Steel Tubing can be saddle flanged, pierced and silver soldered at the joint for a right angle connection.



5 Small size Bundyweld takes the famous double flare as readily as the larger sizes. Here's how it works with 3/16" O.D.



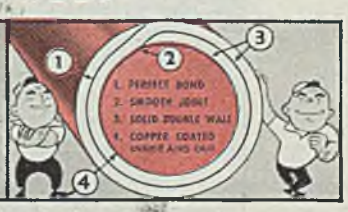
6 Two screw machine operations . . . a sharply cut shoulder at one end and shaping for ball seat at the other end, an easy trick with Bundyweld.

BEHIND THE SCENES WITH BUNDYWELD

Bundyweld Tubing is made by a process entirely different from that used in making other tubing. A single strip of copper-coated S.A.E. 1010 steel is continuously rolled twice laterally . . .

. . . into tubular form. Walls of uniform thickness and concentricity are assured by the use of close tolerance cold rolled strip. This double rolled strip passes through a furnace where the . . .

. . . copper coating fuses and alloys with the double steel walls. After brazing and cooling, it becomes a solid double wall steel tube, copper brazed throughout 360° of wall contact . . .



. . . copper coated inside and out, free from scale, closely held to dimensions. Hard or annealed in standard sizes up to 5/8" O.D. Special sizes cold drawn. Also in Monel, nickel and nickel alloys.

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Eagle Metals Co.
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Alloy Metal Sales Ltd.
861 Bay St.
Toronto 5, Canada

Automatic Shifting

. . . Increases electric lift-truck flexibility

USEP demand for an electric fork truck that is driven in a manner similar to an automobile has been met by a new telescopic, tilting, hydraulic-lift electric fork truck to be introduced to industry at National Materials Handling Exposition in Cleveland, Jan. 14 to 17. Featuring a total lift from ground level of 130 in., the truck, developed by Automatic Transportation Co., Chicago, will pass through a 7 ft door when collapsed.

A feature of the truck is a pneumatic controller, which operates as the electric counterpart of an automobile gearshift. This eliminates tire slippage, enables even acceleration and is said to reduce peak load on the electrical system by two-thirds. When the accelerator is depressed, the controller starts the truck in first speed and automatically passes through the faster speeds.

Truck controls consist of two foot pedals, steering wheel and two levers. Brake and accelerator pedals are identical to those of an automobile. The two levers—one controlling both tilt and lift and the other controlling forward and reverse direction—are just below the steering wheel.

Extra-high lift is made possible by independent hydraulic rams which raise each section of the telescopic lift. A product of wartime research, the truck's hydraulic system is capable of lifting 2000, 3000, or 4000 lb, the amount varying with the model.

Silicone Varnish Used in Installation

Combined with fibre glass, mica and asbestos, the silicone varnish used in the truck's insulation withstands severe overloading for long periods of time, even after exposure to temperatures of 300 to 400° F. Another feature is traction brake of the disk, air-cooled fin type, which provides self-aligning braking through an area of 85 sq in.

Removal of operator's foot from accelerator automatically shuts off the current. Brake is interconnected with the swivel-mounted seat, so that truck is automatically braked when operator leaves seat. These two dead-man controls keep the truck from moving, either under power or rolling, when operator is not in his seat. Caster type, shock-proof trailing axle steering eliminates kick-back when operation is over rough floors.

Other mechanical features with which the new Sky Lift truck is equipped are flange mounted motor and drive shaft through differential to each drive wheel. Driver has full vision of forks, whether empty or loaded. His operating position is well back of uprights to prevent hazard of sitting directly under load.

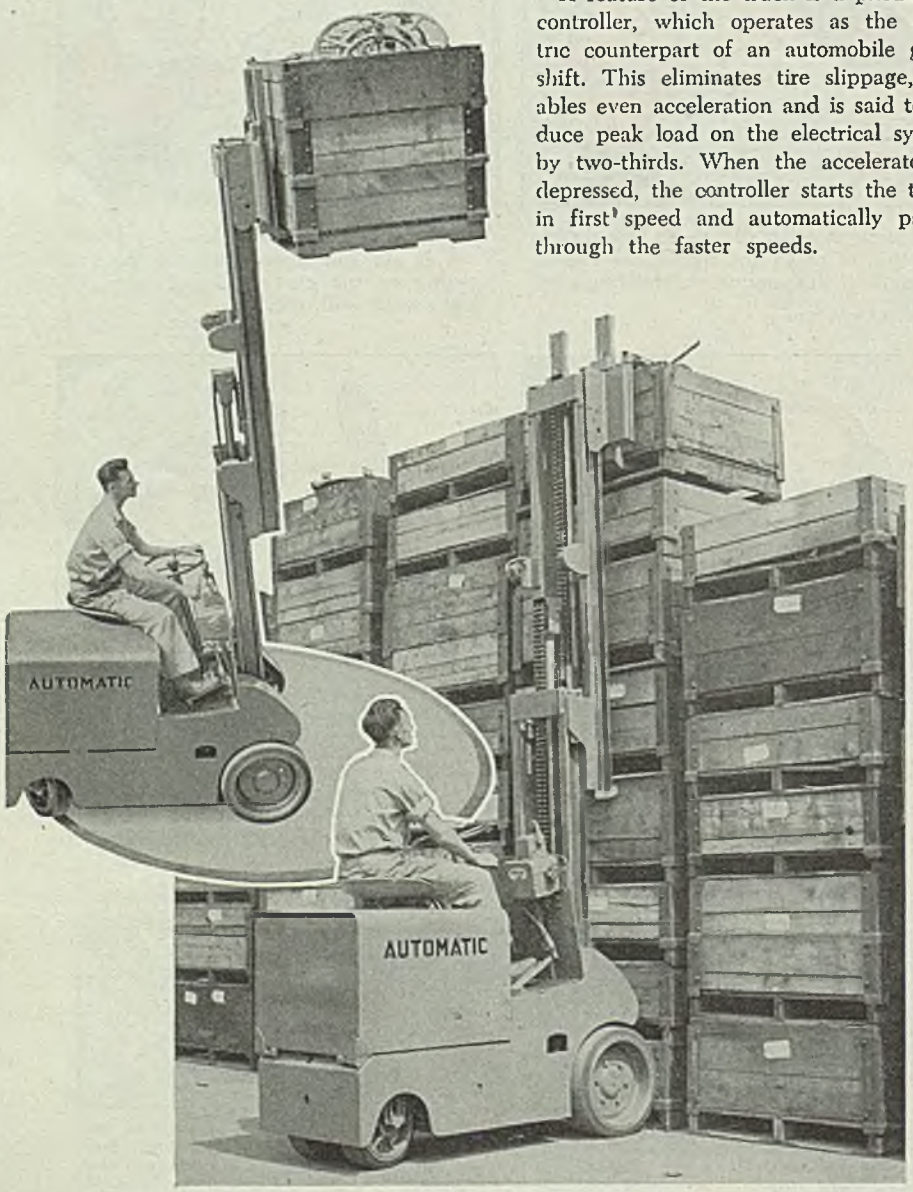

Fig. 1 (extreme left)—Short turning radius of new truck is shown. Operator is using Newmatic control to raise box to a point 130 in. above the floor

Fig. 2 (left)—Truck tiering pallet boxes. Trucks lift 2000, 3000 or 4000 lb by high pressure hydraulic system, rams of which are shown between lift uprights

Movie Shows Interior of Electric Arc Furnace

Changes occurring during a heat within an electric arc furnace may be seen in actual colors in the new movie produced in Allegheny Ludlum Steel Corp. plant in Dunkirk, N. Y. Said to show for the first time the conditions inside a furnace, the film was taken by a camera set 8 ft from the open furnace door where the heat was 2300° F, allowing sequence to be of only 25 to 30 sec in length. A telephoto lens was utilized during this filming.

Slag covering the molten steel is shown first, followed by shots of the slag being broken apart. Animated diagrams describe the melting process from the moment the scrap is placed in the furnace until the final process when the stainless is poured.

Entitled "Melting of Huron Die Steel", the movie is available along with another entitled "Corrosion", for showing to interested groups. The latter movie contains an explanation of mechanism of corrosive attack and development of stainless steels.

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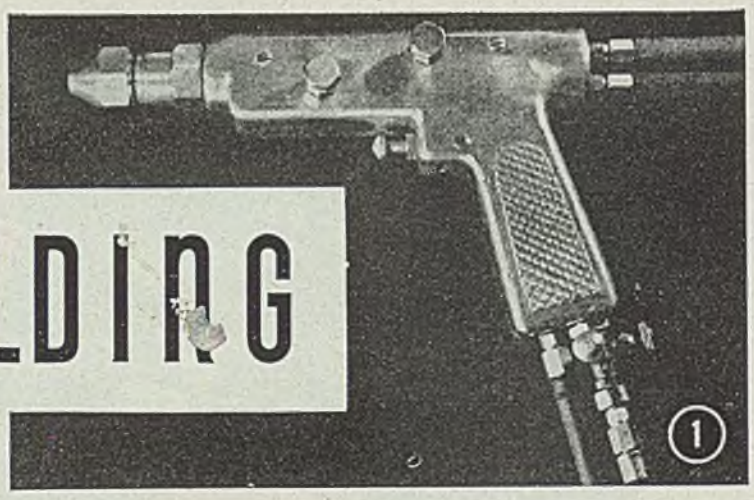
SPRAY-WELDING



Hard-facing process uses a powder-flame spray gun that produces a molecular or fusion bond between the sprayed, powdered alloy overlay and base metal

OVERLAYS of powdered hard-facing alloys can be applied by means of a process that combines the advantages of welding and metallizing practice. Procedure used in applying the overlay consists of the following three steps: The surface of the area to be overlaid is prepared; an overlay of the desired thickness is sprayed on with a gun; finally, the sprayed material is fused to the base metal. This process, developed by the Wall Colmonoy Corp., Detroit, Mich., is fast, economical and produces a smooth, well bonded deposit that is free of porosity.

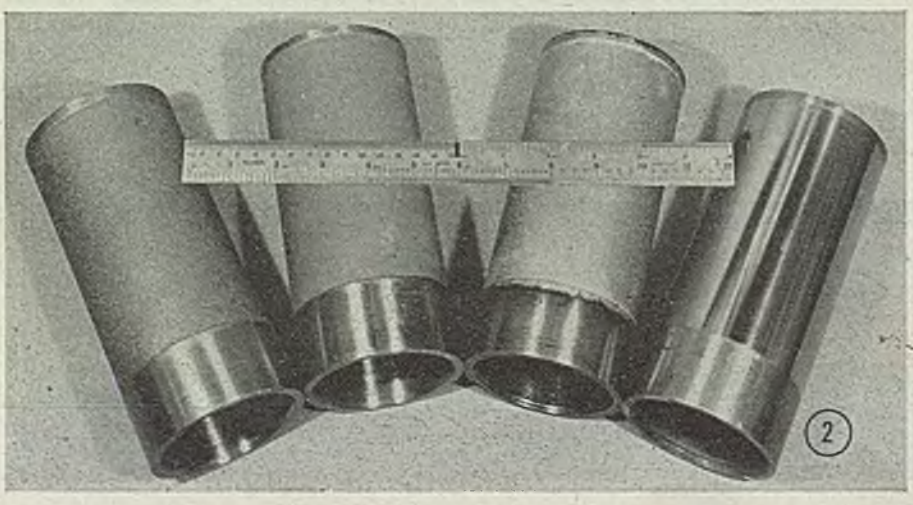
Equipment needed for applying the overlay by this method consists of a gun, air hose, oxygen and acetylene hoses with connections to fit standard regulators, carburetor, and hopper for the powdered metal. The gun, which is called the Spraywelder, was designed for use with the company's line of powdered hard facing alloys. As shown in Fig. 1 it has four control valves—the two that are located on the handle are used to control the oxygen and acetylene, the other two valves, located on the side of the gun, control the propellent air and the rate of powder flow. In addition to the tank oxygen and acetylene, an air line is needed that is capable of delivering 15 cu ft of dry air per minute at a minimum of 75 psi. It is also necessary to have a regulator in the line to adjust air pressure to the working pressure required for different jobs.

To insure that a good bond is secured between facing alloy and the base metal during the spraying operation, the area to be overlaid is grit-blasted. This prevents the sprayed overlay from lifting or peeling during the subsequent fusing operation. The complete procedure for the coating of a surface is essentially as follows: If the surface to be overlaid is under 28 rockwell C in hardness it may be grit-blasted. If it is harder than this value, a thin layer of nickel is applied by the Metco Fusebond process or similar processes. Spraying is done with the spraywelder using a 150 mesh powder and acetylene-oxygen fuel gas. Bonding of the deposited metal may be accomplished by a wide, brushy acetylene torch flame, induction heat, or controlled atmosphere furnace heat at a temperature

Fig. 1—The Spraywelder gun has four control valves: The two valves located on the side of the gun are the powder and propellent air controls, the oxygen and acetylene controls are those located on the handle

Fig. 2—Typical progressive steps followed in the application of the overlay is illustrated here using pump sleeves. From left to right: Sleeves undercut and grit blasted; powdered hard-facing alloy sprayed on the prepared surface; overlay fused to base metal by acetylene flame; sleeve finish ground

Fig. 3—This process may be used for hard-facing large parts such as the forming die shown here. This photo shows the grit-blasting operation prior to spraying on Colmonoy No. 6



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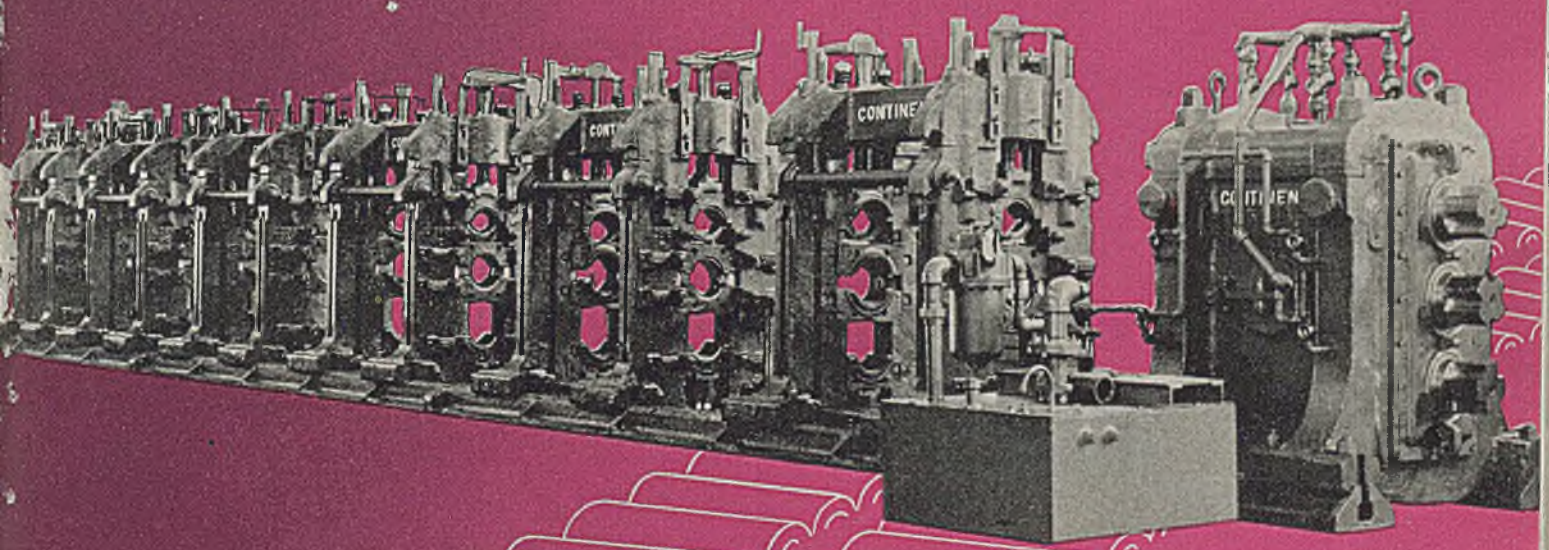

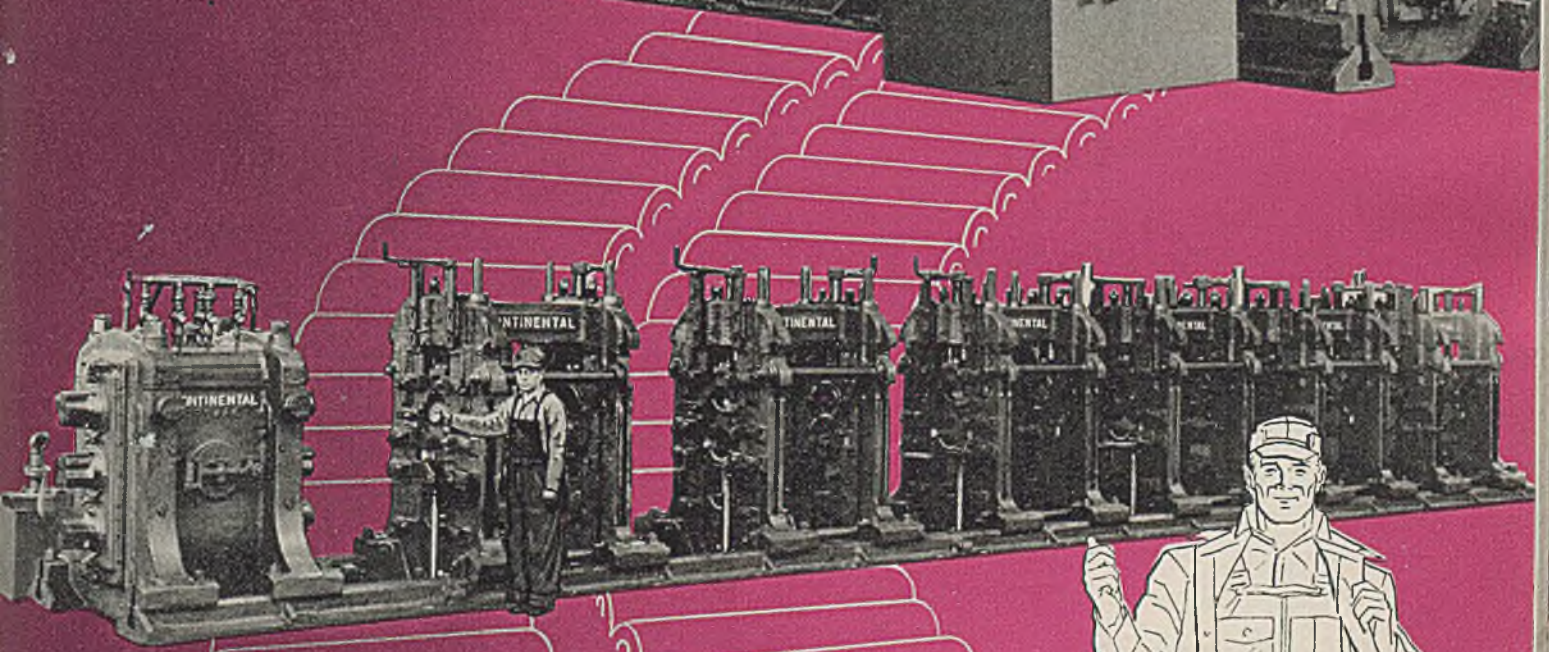

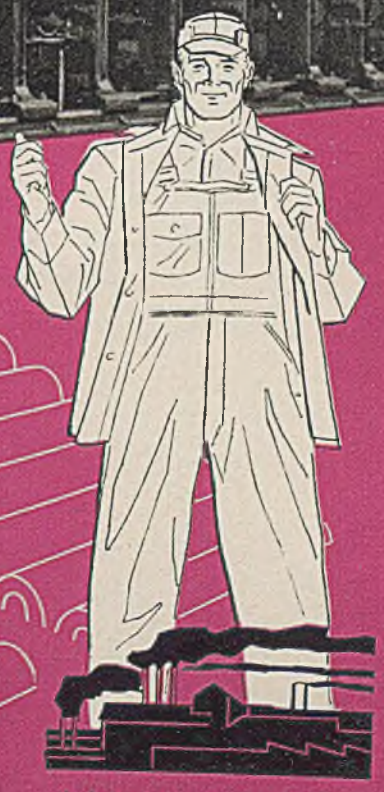

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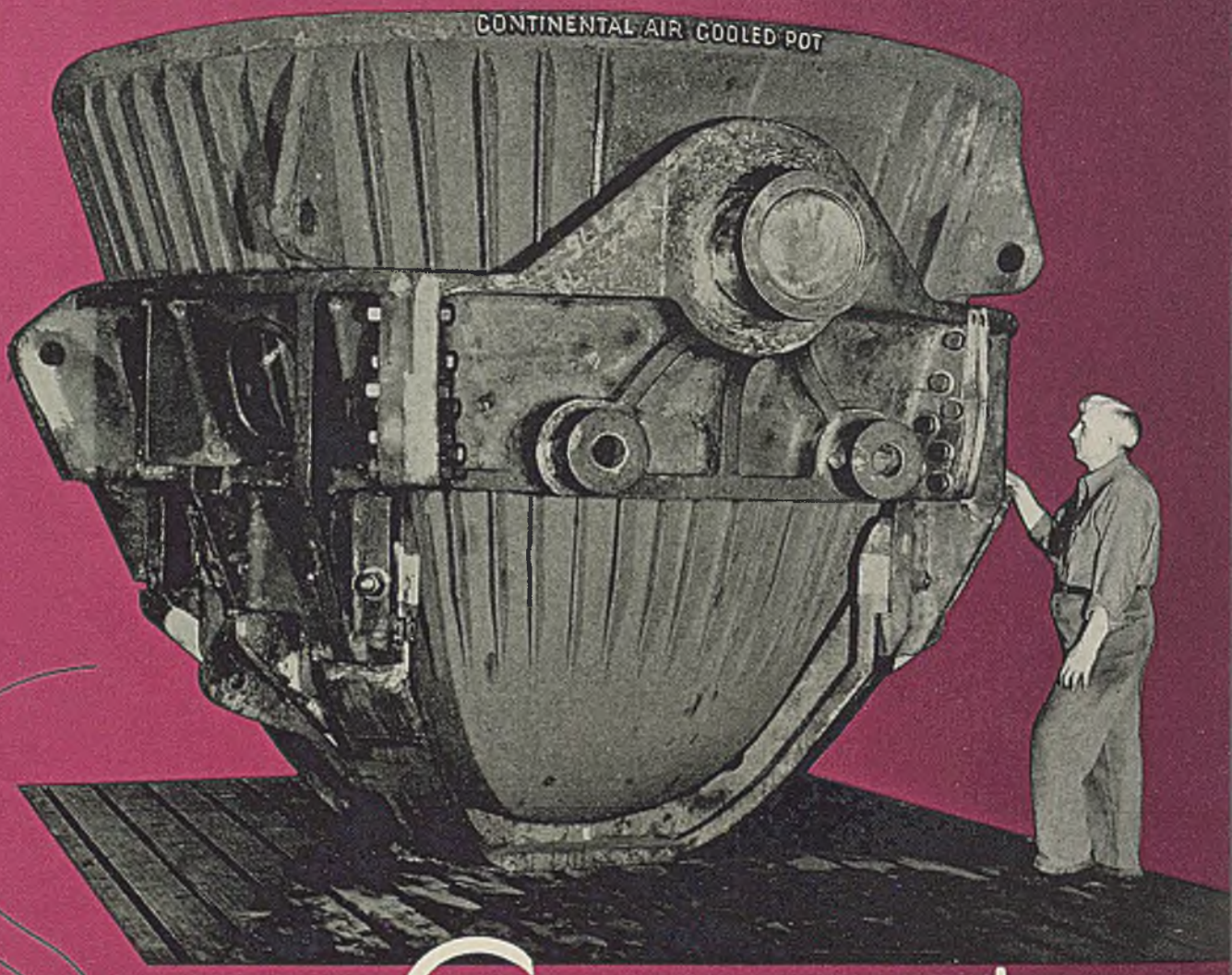

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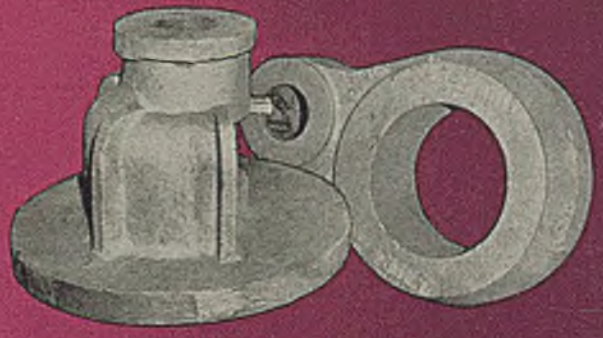
Multiple heat dissipating vertical ribs add great strength to sidewalls, promote rapid air cooling. Cradle type trunnion ring and support permits sidewalls to 'breathe' within the ring. A major improvement—proved in service.



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PROPERTIES OF HARD FACING ALLOYS

	Hardness Rockwell C	Specific Gravity	Melting Point °F	Analysis Approx. %	Characteristics of Hard-Facing	Typical Uses
No. 6	56 to 62	7.80	1925°	Ni. 65 to 75 Cr. 13 to 20 B. 2.75 to 4.75 Fe., Si., C.—10 max.	High red hardness. Very high wear-resistance. Very high corrosion - resistance. Finished by grinding only.	For hard-facing parts to resist wear, corrosion, heat and galling, such as shaft sleeves, hot oil pump parts, thrust collars, seal rings, steam valve trim, bushings, cams, gages, sprocket teeth.
Special No. 5	47 to 52	8.02	2000°	Ni. 74 to 77 Cr. 17 to 19 B. 3.5 to 4.5	Very high wear-resistance. Very high corrosion resistance. High red hardness. Good machinability.	Particularly suited to parts subject to chemical attack such as valve parts, guides, pump parts.

of 1980° F. The advantage of using a furnace to bring about the fusion of the two metals is that distortion of the part is held to a minimum.

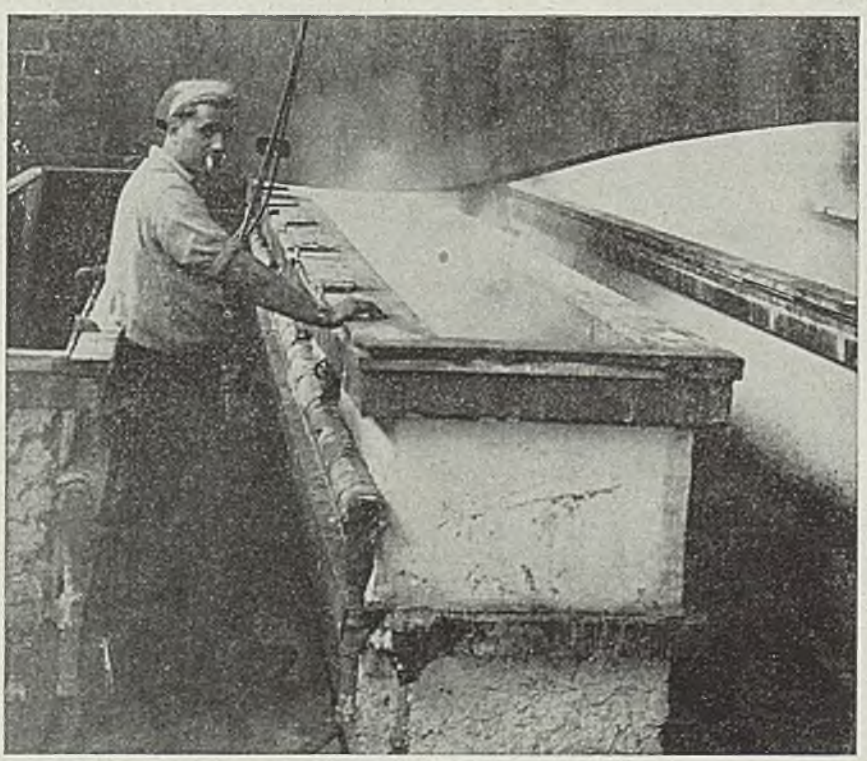
Properties of the powdered metals are given in the accompanying table. These alloys have high resistance to oxidation at elevated temperatures and therefore the overlay does not oxidize during the fusing operation. In addition, the alloys possess a wide "plastic" range—this property assures the feasibility of applying an overlay to any contour or shape which can be sprayed. The powdered alloy No. 6, for example, has a plastic range from approximately 1850° to about 2050° F. While in this semi-viscose state, it will bond to carbon and stainless steels, cast irons, and copper without flowing.

The Spraywelding process can be employed to hard face a variety of parts and a wide range of sizes. Fig. 2 shows the progressive steps in the application of this process to pump sleeves; the hard facing of large areas such as a forming die is illustrated by Fig. 3. However, the thickness of overlay that can be applied is of course somewhat limited.

As much as 0.080-in. can be sprayed on and bonded quite satisfactorily, but where this much overlay is required the job should be done by oxy-acetylene welding. For economic reasons, as well as the fact that heavier overlays are more difficult to fuse than lighter ones, it is recommended that 0.060-in. be considered the maximum thickness of overlay that can be most advantageously applied. Furthermore, since the overlay shrinks approximately 20 per cent in fusing, the actual maximum thickness before fusing should be held at about 0.075-in.

Compound Development

Prevents Over-Pickling



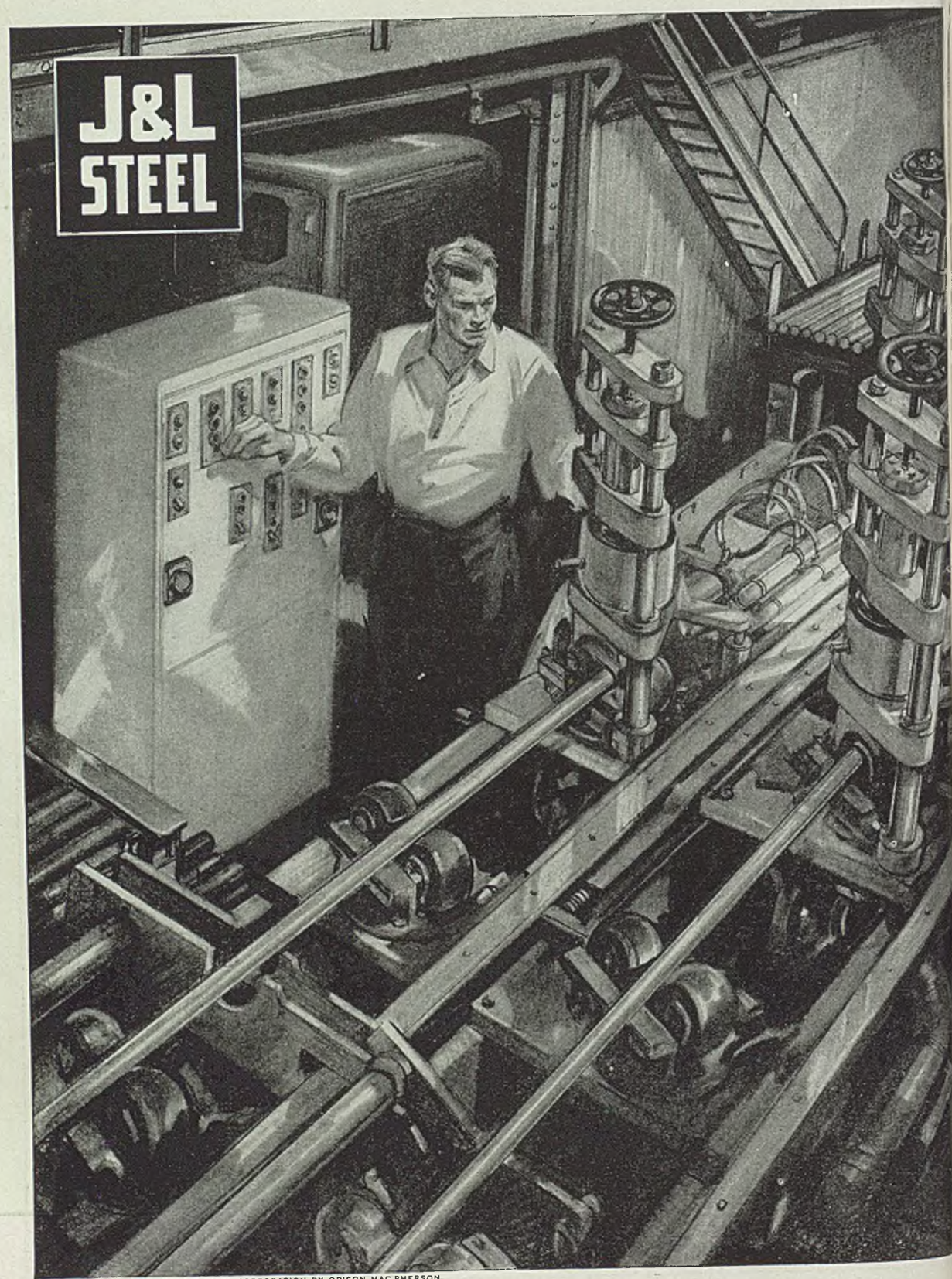
PICKLING compound consisting of dry, dormant chemicals that become active only in contact with water, according to Waverly Petroleum Products Co. of Philadelphia, is said to be entirely safe to handle. Made in two strengths, it is offered in three different formulas for bright dipping, etching of ordinary and stainless steels and for pickling of stainless steels and chrome-nickel alloys.

Over-Pickling Avoided

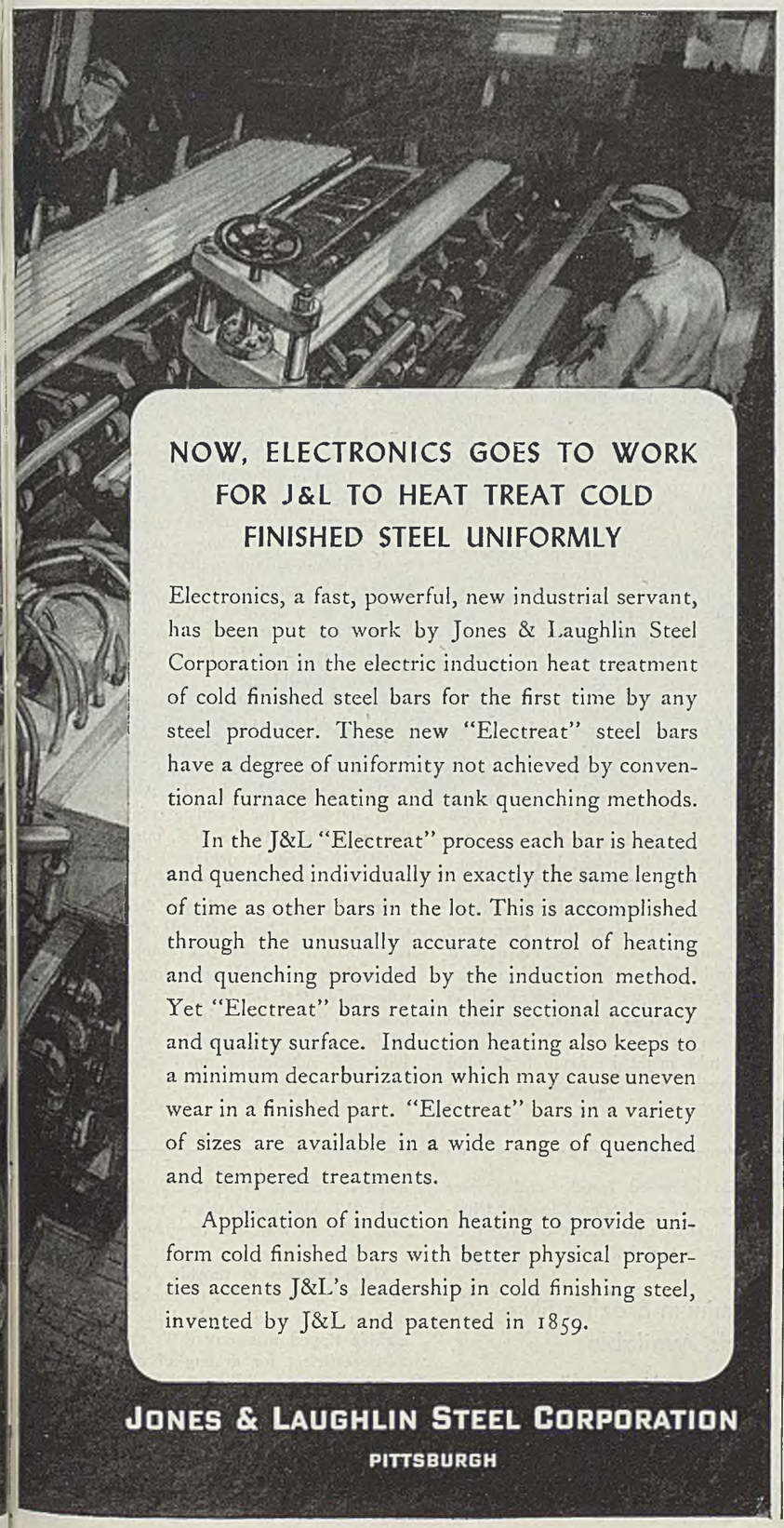
According to the company, danger of over-pickling is avoided as only enough hydrogen gas is developed to accomplish the complete disengagement of the scale from the metal. To protect personnel, an additive, Protectofoam, is induced in the compound. This traps and filters out corrosive acid, retaining it in the tank and giving free exit to noncorrosive gas only—making it unnecessary for protective clothing to be worn by those employees who are at work nearby.

Installation in accompanying photo is that of Churchward Co. of West Haven, Conn. Without dangerous fumes or acid spray, the company states that the compound may be heated to higher temperatures, enabling it to work faster.

For certain special operations, hydrochloric (muriatic), hydrofluoric, phosphoric, chromic and nitric acids may be combined with the compound. Ferric chloride may be added to reduce pickling time and to give a deeper etch.



DRAWN FOR JONES & LAUGHLIN STEEL CORPORATION BY ORISON MAC PHERSON.



NOW, ELECTRONICS GOES TO WORK FOR J&L TO HEAT TREAT COLD FINISHED STEEL UNIFORMLY

Electronics, a fast, powerful, new industrial servant, has been put to work by Jones & Laughlin Steel Corporation in the electric induction heat treatment of cold finished steel bars for the first time by any steel producer. These new "Electreat" steel bars have a degree of uniformity not achieved by conventional furnace heating and tank quenching methods.

In the J&L "Electreat" process each bar is heated and quenched individually in exactly the same length of time as other bars in the lot. This is accomplished through the unusually accurate control of heating and quenching provided by the induction method. Yet "Electreat" bars retain their sectional accuracy and quality surface. Induction heating also keeps to a minimum decarburization which may cause uneven wear in a finished part. "Electreat" bars in a variety of sizes are available in a wide range of quenched and tempered treatments.

Application of induction heating to provide uniform cold finished bars with better physical properties accents J&L's leadership in cold finishing steel, invented by J&L and patented in 1859.

JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH

"ELECTREAT" STEEL

Smart design and production engineers step up their production and cut out costly heat treating operations by using quenched and tempered cold finished steel for parts of autos, domestic appliances, business machines and many other applications. By using bars heat treated for them in the steel mills they gain advantages of increased strength, ductility, hardness, toughness without necessity of heat treating the finished part in their own plants. This also removes possibility of distorting the article after intricate machining work has been completed. They now will find that J&L "Electreat" bars give them additional advantage of increased uniformity over conventional heat treated bars.

Cold finishing, patented by J&L in 1859, improves size accuracy, surface, and physical characteristics of hot rolled steel bars. All the advantages of cold finished steel are retained in J&L "Electreat" process.

Electronic principle of transformer is used in "Electreat" induction heating method. High frequency electric current flowing through a coil transfers to the bar passed through it. The resistance of the bar to the current causes heating to take place with extreme rapidity. In "Electreat" process the bars are fed continuously through an induction coil. Depending upon their size and desired temperature, they are heated in 15 to 25 seconds to about 1600 degrees F. The coil itself, which does not come in contact with the bar, remains cool. In fact, you could place your hand inside and not feel heat, yet if you had on a metal ring it would be melted instantly. When the bars leave the coil they pass through a cone of water sprays which strike the steel at high pressure. This produces a rapid rate of cooling to harden the steel. In cases where this more severe quench will fully harden the section it may be possible to substitute plain carbon steel for a low alloy steel.

Steel can be quenched in many mediums, including air, water, brine, molten salts and various light and heavy oils.

Heat treatment is ancient art, was practiced by mystics and alchemists of the Middle Ages in fashioning armor and swords. Centuries later the village smithy still depended upon his sense of color for his crude but no longer mystic heat treatment. He heated steel in forge to dull red, cherry, or orange, plunged it into oil or water and determined by filing or scratching if steel was quenched to proper hardness.

Father of modern heat treating was Henri le Chatelier (1850-1936) who discovered many new facts about the effect of heating and cooling steel. He started the advancement of heat treating from a hit-and-miss art to an exact science.

STEEL for Enameling

In considering substitution of mild steel for enameling stock during the present steel shortage, definite limitations should be recognized

PROBLEM of securing sufficient quantities of high grade enameling stock has raised the question of possible substitution of mild steels during the present steel shortage. Such a problem is not new to the enameling industry; in the past many items, particularly holloware, were manufactured from steel other than enameling quality.

In considering any general substitution, Dr. G. H. McIntyre, director of research, Ferro Enamel Corp., Cleveland, recently pointed out factors to be examined and definite limitations which must be recognized before any attempt is made to introduce such a major change in enameling practices.

All mild steels and enameling iron are made by the basic open hearth process, the principle purpose of which is to eliminate most of the alloying elements and metalloids which are present in the raw materials of the furnace charge. In general enameling iron will run extremely low in carbon, manganese, phosphorus, sulphur and silicon as compared to the same elements in mild steel.

The carbon content is of the most importance and in enameling iron will be in the order of 0.03 per cent as compared to 0.10 to 0.20 per cent in mild steel. Further, the carbon in the enameling iron will be mostly in the combined form as carbides instead of free graphitic carbon. It is this latter form which causes most of the enameling difficulties due to the formation of volatile gases during the firing cycles.

Thus in substitution of mild steel, the tendencies are for more defects to become evident in the enameling surface because of these gases. Other difficulties are usually encountered because of the greater tendency for mild steel to warp, sag and to be subject to laminations that are the result of gas pockets.

It is customary in rolling enameling stock to crop the ingots more carefully than is usually done for mild steels. In rimmed ingots of higher carbon, such as the mild steel, the primary blow holes are more numerous, larger in size and nearer to the surface which often causes the laminations which are only in evidence at the time of the heating during the fusing of the enamel.

Those items which do not require the highest inspection and those which are not to be subjected to deep draw might be made from mild steel. Included in this list might be such items as reflectors, refrigerator and oven liners, stove body sides and wrap-around bodies. Such items as stove tops, oven doors, and refrigerator exteriors as well as possibly inner doors which require the highest inspection standard should continue, as far as possible, to be made from enameling stock. Washing machine tubs might be made from mild steel providing a specification regarding warpage and deep draw qualities were included in the purchase specifications of the steel.

To operate successfully on mild steel, it might be well to institute a system for careful control of quality. It is suggested that before a shipment is approved for fabrication of parts to be enameled representative samples be taken to a control laboratory and such tests as sag, warpage, bending qualities and general enameling characteristics be determined. This is done by enameling the samples and examining for enamel bending qualities, copper heading, blistering, boiling through of ground coat into the white laminations.

Further a system should be provided for fabricating all parts that are to be assembled in one unit from the same lot of steel. For example, a welded refrigerator liner should not have some panels from one lot of steel and other panels from another lot of steel since the enameling characteristics may vary. This would make it impossible to secure satisfactory and uniform enameling qualities on all sides of the liner. If it has been decided that a given lot of steel is satisfactory for enameling, the parts can then be fabricated.

In using mild steel it is absolutely essential to incorporate a well controlled nickel flash step in the cleaning and pickling sequences. A good nickel flash will minimize many variables normally encountered in steel. A nickel flash improves the bonding range of the ground coat to the steel, minimizes copper heading tendencies and overactive oxidation characteristics of steel.

According to Dr. McIntyre the foregoing it not to be construed as a recommendation from Ferro Enamel Corp. to replace standard enameling stock with mild steel for the fabrication of products to be enameled. It is intended only to advise as to the possibility of substituting mild steel for enameling stock because of the critical steel situation.

New Line of Cleaning Products Announced

Seventeen different products including cleaners for maintenance work, ferrous and nonferrous metals, for use prior to painting or vitreous enameling, electrolytic cleaners and special purpose compounds are announced by E. F. Houghton & Co., Philadelphia 33. Designated as Houghto—Clean 200 series, these products include advantages of recent developments in detergency and wetting out.

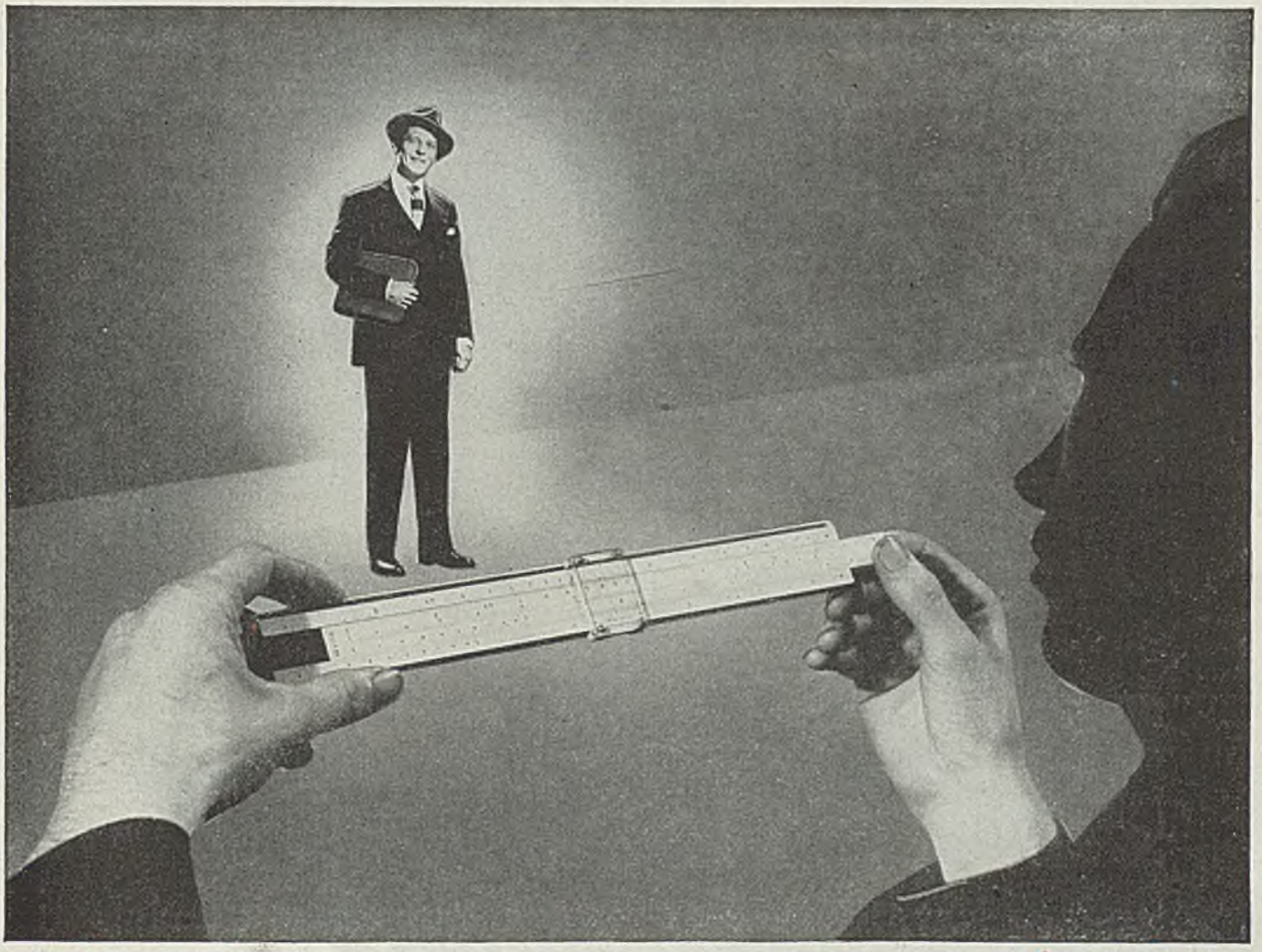
According to the company, the cleaners provide increased speed and greater efficiency in production line use. Ultraviolet light in a fluorescent test was used to evaluate the cleaners.

Aluminum Brazing Flux Made Available

Said to achieve excellent results in fabrication of a wide variety of aluminum products, the Elite aluminum brazing flux meets the demand for an economical flux with a low melting point, according to Air Reduction Sales Co., New York. Properties of the flux make it possible to braze 2S, 3S, 53S and 61S aluminum when used with Airco No. 26 wire, the company states.

—o—

Made oversize to provide for clearance in the installation of anchors, expansion bolts and toggle bolts, latest carbide tipped masonary drills are said to be efficient for drilling of all nonmetallic materials such as brick, cement, marble, slate, tile, stone and glass. Made by Chicago-Latrobe Twist Drill Works, Chicago, the drills are of rotary type and are available in size ranges from 3/16 to 1½ -in. Rotation of drill reportedly eliminates noise and hammering.



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An old hand, an observer and a cast of iron on its way into the ladle

By E. C. WRIGHT
Assistant to Vice President
National Tube Co.
Pittsburgh

TRAINING METALLURGICAL ENGINEERS in the Steel Industry

Requirements include an understanding of routine analytical chemical work, routine physical testing procedure, a knowledge of statistics, ability to handle men, an understanding of all processes and operations in plant, and ability to analyze difficulties and to conduct research work

BASED on 25 years of experience, five in engineering schools and 20 in the steel industry, it appears to the writer that graduates of standard engineering colleges are readily adaptable to actual work in steel plants. Moreover, while graduates from engineering schools have somewhat better training in physics, mathematics, and engineering, it has been a general and continual observation that most of the students employed have had inadequate training in the fundamental sciences such as physics, physical chemistry, thermodynamics, and any form of mathematics higher than simple calculus. For example, it has been frequently noted that young engineers faced with problems in a mill which involve some mathematics generally flounder badly, and that they had little conception of physical chemistry. Another common deficiency lies in the young graduate's lack of knowledge of where to look for the more detailed literature on any subject. An engineer with a sound foundation in basic science can readily adapt himself to any metallurgical industry by means of a few months study of its literature while working in the industry.

Twenty-five years ago there were, in reality, no metallurgical departments. Young engineers were trained by the sweat and hard knocks method. The only thing they were taught about steelmaking was that learned from melters and foremen, and much of that has since been found to be wrong. After 1930, however, the considerable increase in demand for alloy and special steels presented problems with which the old practical steelmakers could not cope, and the necessity for using some technical control over operations became evident. As a result there was a sudden expansion of the acceptance of young engineers into the steel industry. Even under these improved conditions, however, experience has shown that it takes from five to seven years to make an able metallurgical engineer in a steel plant. A survey of the younger engineers in any plant will show very few having less than five years of experience holding the more important positions. The finished metallurgical engineer needs a thorough understanding of routine analytical chemical work, routine physical testing procedure, a good knowledge of statistics, ability to handle men, a thorough knowledge of

all the processes and operations in the plant in which he works, and finally, ability to analyze difficulties and conduct research work.

It has been found beneficial to place metallurgical engineering graduates in a routine analytical chemical laboratory for a period of three to six months and generally, if a student has had good theoretical chemical training previously, within three months on a variety of determinations he can achieve an output which approaches that of the older chemists. Likewise, this work gives the student a thorough grounding in chemical and metallurgical calculations which he will need later. This training has been found to be invaluable in conducting calculations involving smelting and processing which are of prime importance in blast furnace and steel melting operations.

Physical Testing Necessary

Three to six months on routine physical testing is also necessary and in addition, statistical summaries of physical test results on materials made in large volume, usually assembled in the laboratory, teach the student engineer an early familiarity with statistics which have been found of great value in studying mill problems of a metallurgical nature. The next step is several months in the metallurgical laboratory. The final important part of a metallurgical engineer's training is that of becoming familiar with the specifications for the steel products being manufactured, by passing on inquiries and clearing orders before placing them in manufacture, which requires a detailed review of each specification.

Having thus achieved a background of mill and laboratory experience, the student engineer is now ready for mill control work, where he becomes an observer. Usually two months observing work will give an intelligent student a fair cross-section of the operations and processes of any one department, and it is usually the policy to rotate observers through the various important departments in the mill from melting to finishing.

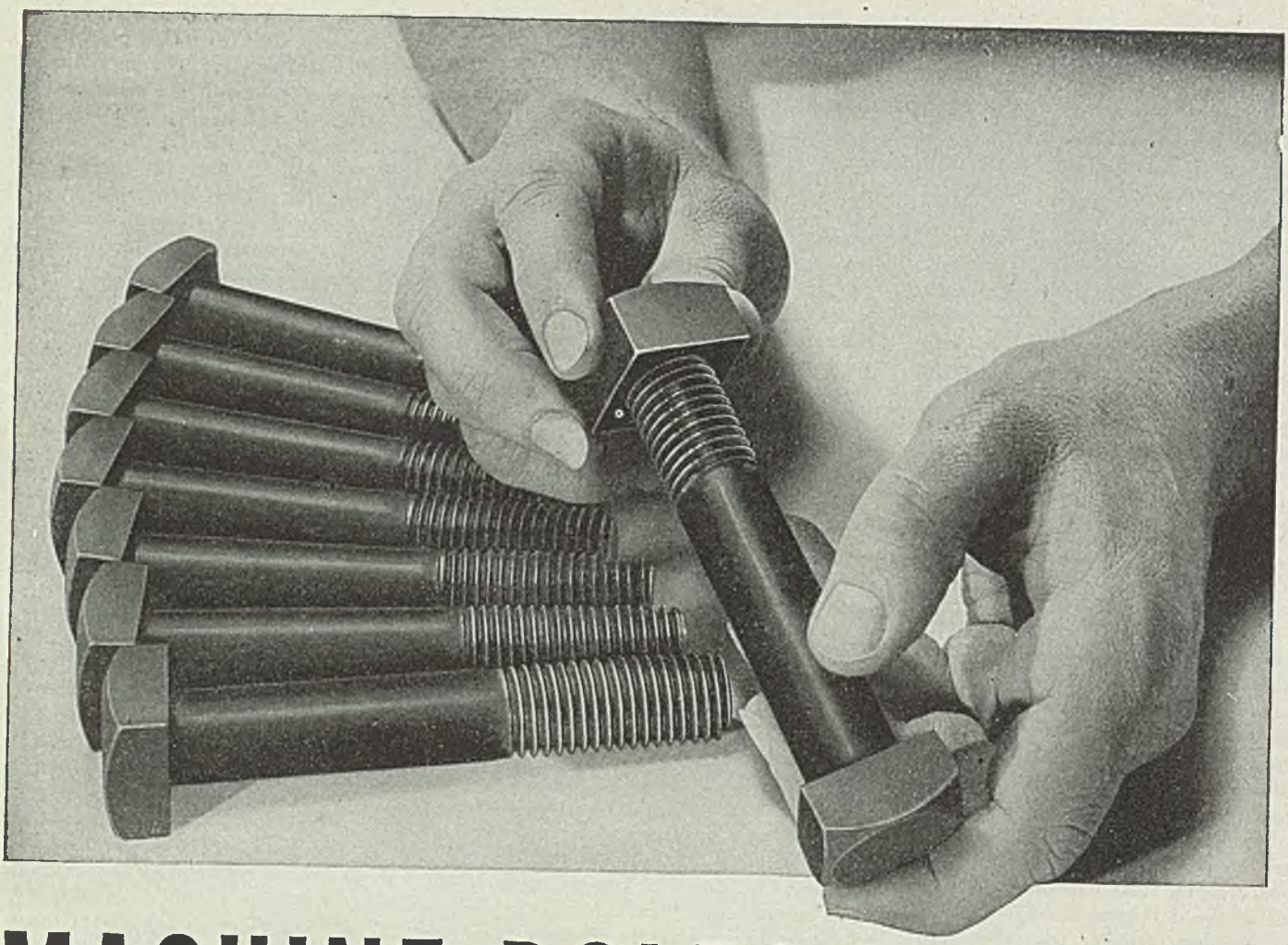
A student engineer who has been in observing work for one or two years, which approximates a total of three years in the plant in question, has reached a stage where it is possible to assign him more responsibility and allow him more initiative in studying problems. At this point he passes on to research and development work where he is assigned one or more problems with the assistance of other laboratory men for study. Student engineers at this stage rapidly show their ability and true quality. This part of the training program has been beneficial to the men of better quality and also supplies a continuing group of younger men to the research laboratory organization who are familiar with manufacturing operations in the company's plants.

During this period of the student's development the question of writing reports also arises and for many this seems difficult. In the beginning this appears to be largely due to the young engineer's obsession with his own research work and an assumption that the report need cover only the briefest details. He fails to realize who will later read the report and generally fails to state clearly the problem, methods used in overcoming it, and definite conclusions as to the results. It ordinarily takes from one to two years of continual report writing to demonstrate to a young engineer what is required in a finished report. A well-written report, however, has often attracted the attention of a higher executive to a young student and has many times hastened promotion to a better position.

After about five years in a steel plant the metallurgist is ready to meet customers and to discuss with them metallurgical factors relating to the use of the product in the consumer's plant. He must, therefore, know not only the various properties of his own material, but also be familiar with the tolerances, range of sizes, finishes and other particular details of the materials under discussion. Experience of this nature gives him a realization of a customer's problems and he returns to his own plant with the aim of improving the product being made to meet, as far as possible, the desire of the user. The metallurgical engineer who exhibits sales and business ability will be the steel salesman of the future. Men who have concluded the mill training are generally outstanding and achieve fairly rapid promotion because of their thorough knowledge of the company's manufacturing procedures.

One way in which greater co-operation between industry and colleges might be accomplished would be to hire a certain number of young men who have completed the first year college course to spend two months in the summer in an analytical laboratory. The next summer could be spent in the physical testing laboratory and after a third year's college work, the metallographic or metallurgical laboratory. By this arrangement the student would have completed almost one year of his necessary mill training work and would certainly get much more from the courses he would be taking in college. The other important advantage is that the student would soon learn whether or not he is really interested in a metallurgical career. During the war, the Army and Navy used apptitude tests for selecting men for a multitude of purposes and claimed great success with these procedures. Quite probably the colleges could also use them as a guide to the

BLAST PLATES: Corrosion trouble explains why 72 tons of wrought iron blast plates were installed on this Union railroad bridge at a Pennsylvania railroad right-of-way in East Pittsburgh, Pa. Plates beneath the bridge protect it from smoke from below; plates installed in overhead framework protect structure members from blasts of locomotives traveling over the bridge. Photo courtesy A. M. Byers Co.



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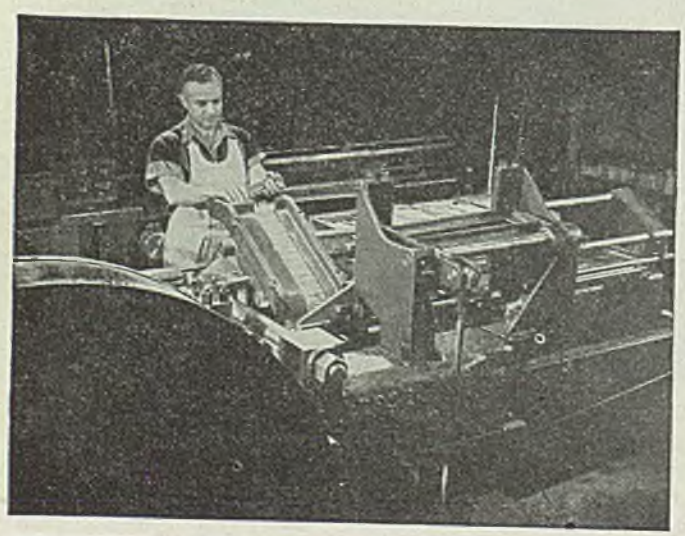
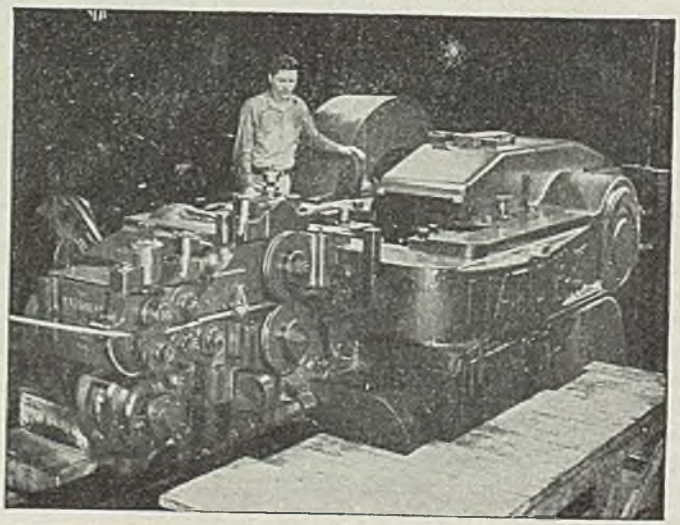
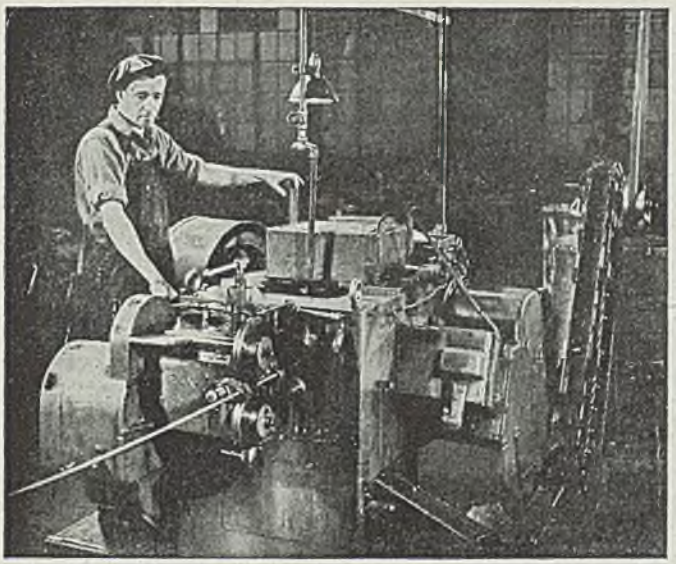
a line of practically unlimited variety ... but just one standard of quality



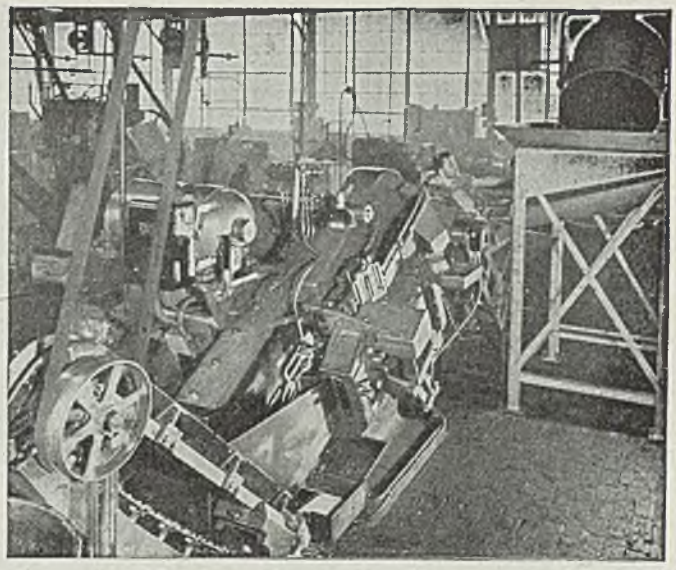
ANY LENGTHS — With the development of the Rod Header, RB&W cold heads the smaller diameters of machine bolts in the longest lengths.



SOLID DIE — This big machine which cold heads in solid dies — insuring maximum accuracy and soundness — indicates scope of RB&W equipment.



HIGH SPEED HEADING — 11,220 pieces an hour is the rate of this ¼" header.

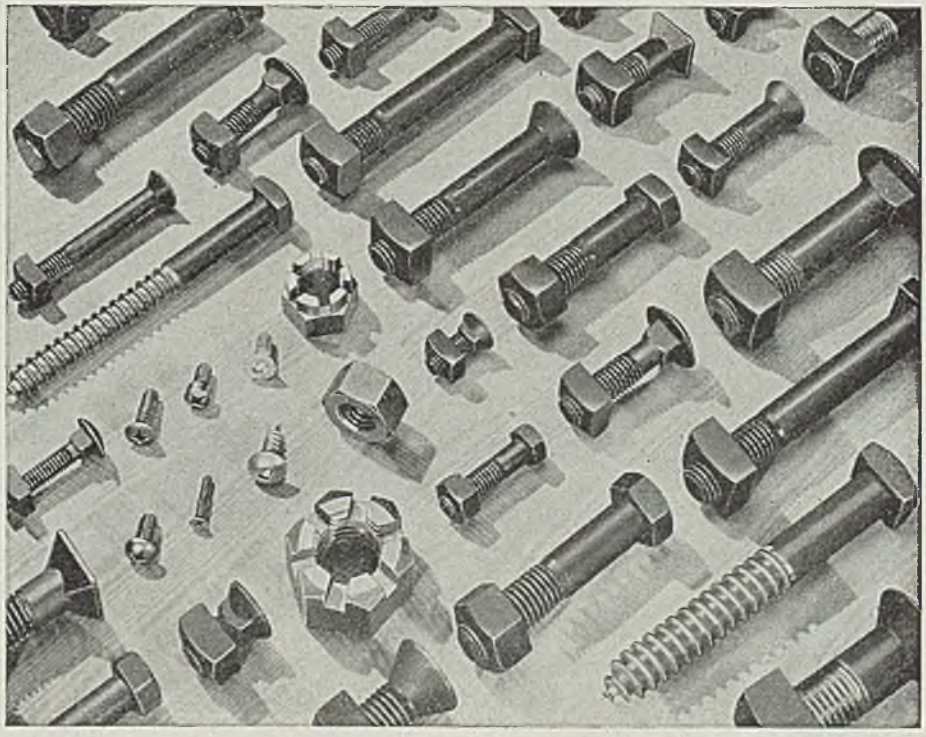


THREADING ACCURACY — RB&W cold forms threads in the widest size range — for maximum strength and precision.

RB&W The complete quality line

The most modern machinery, the use of cold-forming methods for heading and threading, the finest equipped laboratories for analysis of raw materials, and a quality control system that involves continuous inspection *at the machines* . . . assure highest quality and perfect uniformity of RB&W Machine Bolts. These are characteristics which you, as the user, can translate into faster assembly, greater holding power and better appearance.

Whatever your requirements may be in bolts, nuts, screws, rivets and special fasteners, RB&W is your logical source of supply . . . offering the advantages of a 101-year old experience and unsurpassed research and production facilities to provide you with *engineered* fasteners of maximum strength and accuracy and finest finish.



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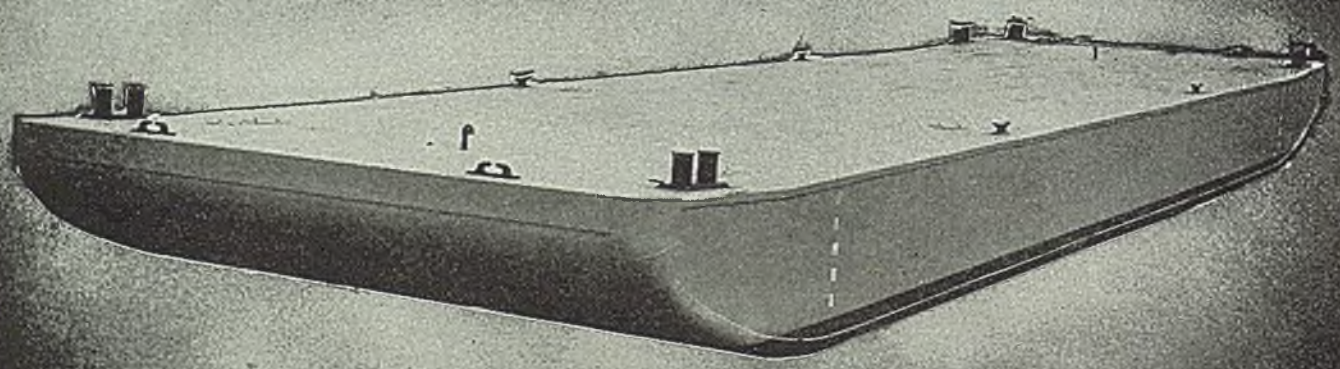


Liquid—dry cargo—drilling rigs—derricks. Look over our stock designs—or let our engineers design a barge to suit your particular needs.

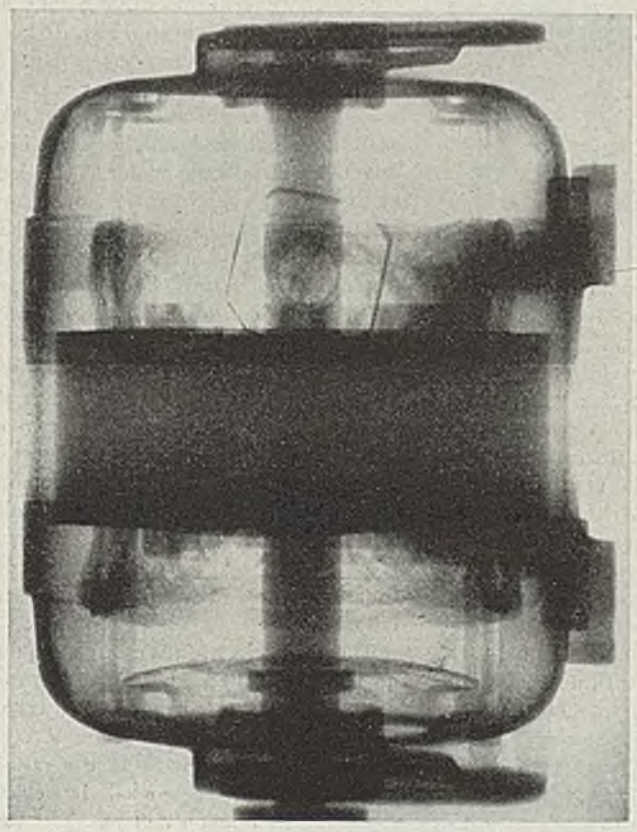
Pictured here is an all-purpose barge to meet post-war requirements. It can be used for either deck or liquid cargo. Notice the long, plated rake—for swifter, easier towing. Dimensions: 110' x 30' x 7'. Capacity: 450 tons of deck or 3,200 barrels of liquid cargo.

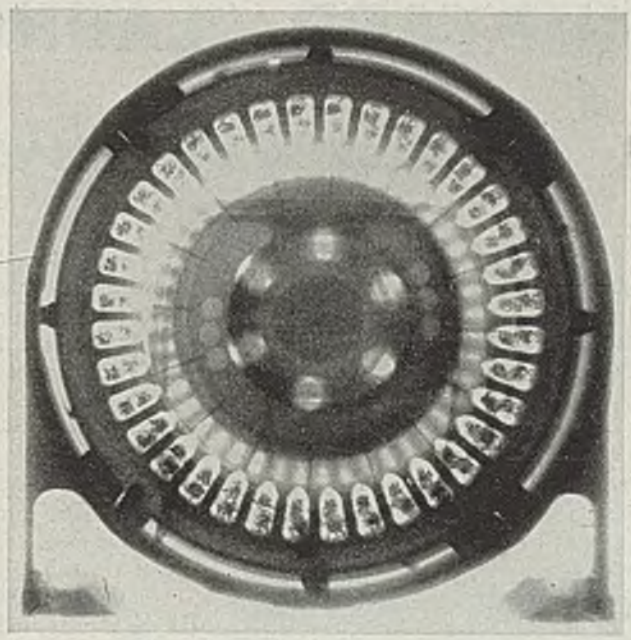
STEEL

AVONDALE MARINE WAYS, INC.

TELEPHONE: OFFICE AND PLANT, WALNUT 8970

RIVER FRONT, NEW ORLEANS DISTRICT, WESTWEGO, LOUISIANA





"SEEING IS BELIEVING": These radiographs taken with the 20-million-volt betatron built by Allis-Chalmers Mfg. Co., Milwaukee, STEEL, Nov. 25, 1946, p. 68, indicate the machine's possibilities for improving industrial inspection and research. Left is side view of 3-hp induction motor, x-rayed in 60 sec at a distance of 4 ft from the betatron. Detail of stator windings, laminations and end bearings is well revealed; terminal box can be seen clearly at right. End view of the motor, above, was obtained with a 90 sec exposure at a distance of 4 ft from betatron target. Keyway is lined-up with center of x-ray beam. Note detail of hundreds of stator slot windings, of the bearings and rotor running clearance. On original radiograph negative, the bearing raceways and many other details are quite distinguishable.

kind of course which a student should take and to the kind of work which a graduate should follow upon leaving college.

Demand Continues to Increase

Demand for metallurgical engineers in the steel industry will undoubtedly continue to increase. Many companies have announced plans for new or enlarged research facilities and the amount of money appropriated for this work in industry after the war will be greatly increased. More technical men will be needed for fundamental research; more trained engineers for controlling operations and introducing new products for manufacture; and more sales engineers for sales and service work among consumers. A serious deficiency now exists and co-operation between college and industry should save at least two years in the training period, at least for metallurgical engineers, and should also be applicable to other branches of technology.

A summary of the writer's past experience in the development of metallurgical engineers in steel plants points to certain pertinent facts which should be emphasized by any company which wishes to undertake a program for the improvement and expansion of its technical personnel. These will include:

1. A definite program covering at least ten years for the recruiting of a fixed number of undergraduates and graduates each year should be established.
2. Standard apprentice courses should be organized with definite rates, a standard number of hours worked, embodying a training program which best fits each industry.
3. For metallurgical engineers the training program should include at least one to one and a half years of routine laboratory work followed by observation and development work in plant operations.
4. Engineering apprentices should be under the direct supervision of the technical personnel throughout their training period.
5. Co-operative arrangements should be made with selected colleges to insure that apprentices will be obtained from a number of different schools, and every effort made to recruit undergraduates for summer and vacation as early is possible in their college course.
6. The college course in metallurgical engineering should be arranged as far as possible to fit the requirements of the steel industry for those undergraduate students who are employed.
7. More emphasis should be given to fundamental scientific courses with some reduction of applied industrial engineering courses.

Condensation of a paper presented before the American Institute of Mining and Metallurgical Engineers, Chicago, Feb. 25-28.

Reports on Ferritic Steels Issued

Many ferritic steels show failure under lowered temperatures and generally react differently from other industrial alloys during cooling according to four reports issued by Office of Technical Services, Department of Commerce, Washington. Prepared by Francis T. McGuire of University of Kentucky, the reports contain information on the various tests conducted.

Report PB-16401 contains data on investigation of 11 forged steels in 39 different treatments for behavior under impact between temperature limits of minus 310° and plus 375° F. PB-16400 presents 66 curves of notch bar behavior of 29 steels between minus 310° and plus 375° F. Reports PB-16399 and PB-16398 contain a general analysis of behavior of ferritic steels under lowered temperatures.

SHIPYARD "LAUNCHES" *Locomotive*

FROM shipbuilding to locomotive building—sums up the partial transition of Ingalls Shipbuilding Corp. from war work to postwar developments as the Pascagoula, Miss. plant completed what is said to be the first diesel-electric locomotive ever built by a shipbuilding company.

The locomotive, recently demonstrated in Birmingham, hauled 7719 tons in 93 ore cars at speeds up to 50 mph. It is a 1500-horsepower, all-purpose type suitable for heavy switching or transfer service, or for freight and passenger road use, either singly or in multiples of two, three or four units—forerunner of the "several hundred a year" the company expects to build.

Decision to manufacture the diesel product followed a survey recently conducted by Ingalls to find a steady outlet for its large manufacturing facilities to supplement building of ships. Said R. H. Macy, chief of the Locomotive Division, in commenting on the company's decision: "We wanted to manufacture a product that was adaptable to our facilities, one that would use the skills of our personnel and one with a steady market. It is estimated that it will take the locomotive industry 13 years to catch up with domestic demand".

Locomotive features turret type cab construction which provides the operator with 360-degree vision. A pilot at each end of the unit enables it to run in either direction. A vestibule at the rear of the locomotive provides a sheltered location for switching crews to keep them out of the cab.

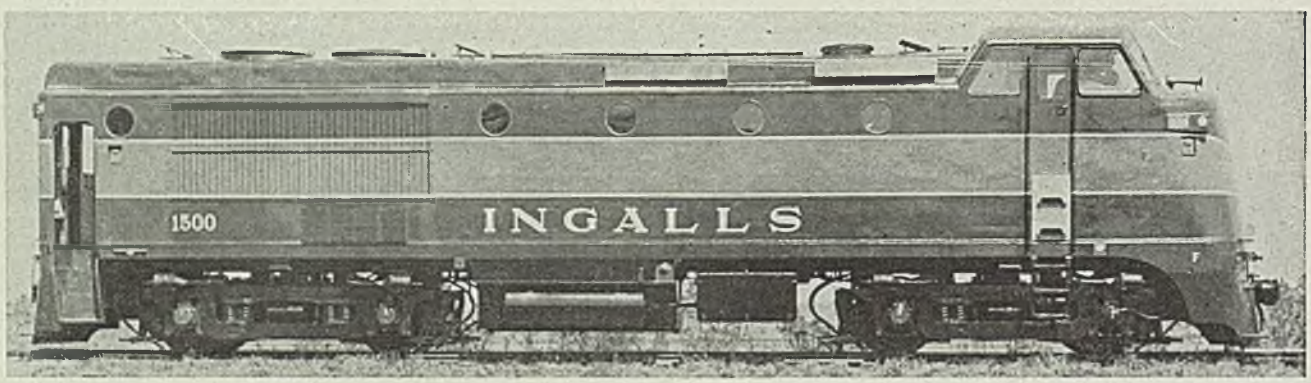
Welded steel construction is used for the body and underframe of the diesel electric. Underframe consists of 14 H-beams for center sills with a heavy plate across the top and bottom of the sills. Trucks are of swing bolster type, each having eight triple-coil springs and two quadruple full-elliptic springs, and 42-in. wheels with clasp brakes. Two axles are provided for each truck with traction motors geared to each axle.

The locomotive is equipped with a 1650 hp diesel engine made by the National Supply Co., Superior Engine Division of Springfield, O. This is a 4-cycle turbocharged type operating at 660 rpm. The engine, after deducting the auxiliary load for driving fans and other equipment, delivers 1500 net horsepower for traction purposes.

Individual fuel injection pumps actuated by a chain-driven engine crank shaft are used, fuel supply pump being driven by an electric motor. The locomotive is provided with the usual alarms for the lubricating oil and water cooling systems. In addition a bearing watchdog system, manufactured by Paxton Diesel Engineering Co., shuts off the engine in the event of excess wear or failure of bearings.

Straight fin-tube radiators in each side of the locomotive are built in two entirely separate sections. In event of failure of one section, the locomotive will still have three-fourths of its cooling capacity left. Radiators are generously proportioned so the locomotive can continue to operate at full power under such difficulty.

The diesel electric's Westinghouse main generator is rated at 750 v maximum with a continuous rating of 1760 amp at 660 rpm. Traction motors are Westinghouse Type 370-F with a gear ratio of 15:63. These are cooled by electric motor-driven traction motors. The latter are connected in series-parallel only, eliminating apparatus required for transition from series-parallel. This, in addition to saving switches and relays, improves operation of the locomotive by the steady application of power during the acceleration of the train.



Rubber Supply Appraisal Included in Booklet

An appraisal of the supply, progress, costs and outlook for both American synthetic and crude rubber at the end of the first year after V-J day is included in the booklet published by B. F. Goodrich Co., Akron. The ninth of a series of studies of the rubber situation in the United States, the booklet presents the situation as it is today and its immediate outlook.

According to the company, it is desirous that there be a state of competition existing between synthetic and natural rubbers. A recommendation for giving consideration to the early establishment of such free competition is stated. Figures showing estimates of rubber demand and supply of the United States and the world also are included.

Book on Steel Yield Strength Available

Presenting data on relationship between brinell hardness values and tensile and yield strength of wrought and cast steels, a report published by Office of Technical Services, Department of Commerce, Washington, contains formulas and tables for calculating these values. Data, compiled by Col. Welton J. Crook for use at U. S. Army's Rock Island Arsenal, covers various conditions of tempering and heat treatment of wrought, SAE, national emergency steels and steel castings.

Report, entitled Relation Between Hardness and Tensile and Yield Strengths, Ferrous Materials; PB-30814, may be obtained by writing to the department.

Industrial Equipment

Air Grinders

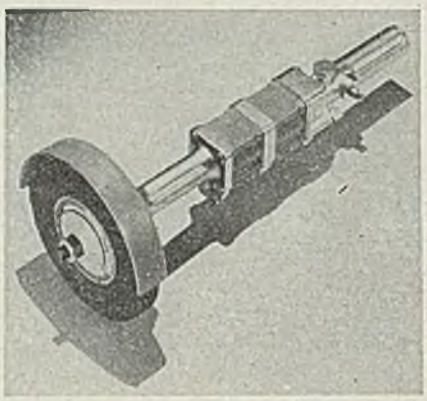
Used in cleaning castings, hogging out defects in steel castings, removing fins, grinding welds and polishing sheet metal work, two air grinders manufactured by Rotor Tool Co., 17325 Euclid avenue, Cleveland provide the operation with increased power and higher load speed. Model No. D-325, immediate right, for 8 in. wheels, weighs 11¾ lb, is available with straight, spade or safety type handle and speeds of 4500, 4100 and 3100 rpm for different types of wheels.

Model No. D125 weighs 9¾ lb, operating at speeds of 4100 to 6000 rpm for wheels up to 6 in. in diameter. M-801 governor idles grinder at permissible free speed as determined by safety code. As soon as pressure is applied to work, tending to reduce speed, governor opens quickly to deliver full air at high load speed. Tool is light in weight because of use of magnesium and a light motor unit. Main parts of both grinders are interchangeable. Both can be used with 13 and 27½-in. extensions.

Steel 12/23/46; *Item No.* 9037

Roll Lathe

Featuring a face plate partially enclosed within the headstock for safety, the roll lathe, illustrated below, developed by Lewis Foundry & Machine Division of Blaw-Knox Co., Pittsburgh, has a headstock consisting of heavily ribbed construction of two sections and internal lamps to enable oil and gear inspection during operation. Motor can be moved and located on either side or on top of headstock for maximum utilization of space available. Lathe includes worm and helical drive gears, roller bearings in the headstock and a separate oil circulating pump for bearings and gear teeth. It is adaptable for turning heavy



forgings with automatic feeds and is built in every range of roll size from 64 in. down.

Steel 12/23/46; *Item No.* 9035

Dial Indicators

Variations in dimensions as small as 0.00001-in. are detected by the Super master checking dial indicators manufactured by B. C. Ames Co., Waltham 54, Mass., when used as master checker in the tool-room production line. They also may be used as surface analyzers to check trueness and finish of ground surfaces, chatter of tools or work, etc.

Overall bezel diameters of new models are 2¼ and 2¾-in., respectively. Graduations are 0.0001-in. and range is 0.008-in.

Steel 12/23/46; *Item No.* 9840

Thickness Gage

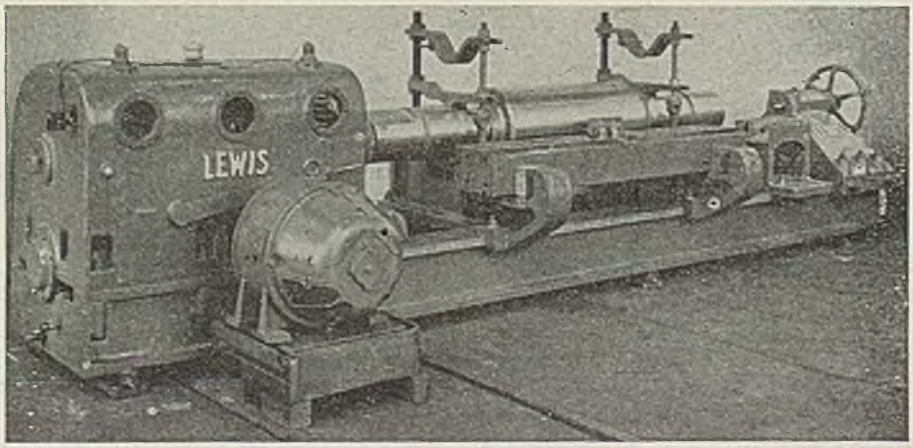
Thicknesses of many materials including steel may be measured from one side only with the portable, self-contained Audigage, model FMSS-4, shown right above, Bransom Instrumets Inc., Joe's Hill road, Danbury, Conn. Its application is nondestructive, utilizing a crystal-type gage head, powered by a frequency-modulated electronic oscillator. When vi-

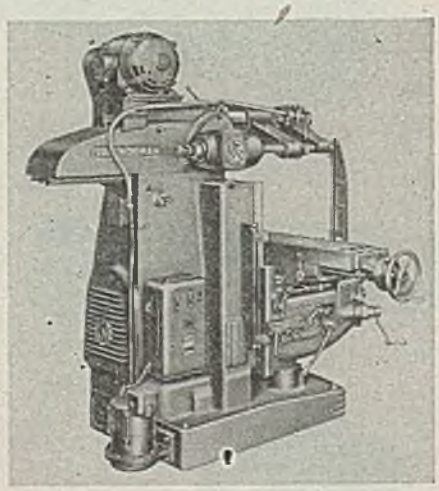
brating crystal is applied to a wall surface, mechanical resonance of the wall thickness can be produced directly below the crystal. Frequency at which wall section will resonate is directly proportional to velocity of sound in the material and inversely proportional to thickness. Gage provides a means whereby audible signals are produced corresponding to harmonic resonance. Frequency difference between any two adjacent audible signals as read on tuning dial is converted into wall thickness on a concentric thickness scale. Battery operated instrument covers a range from ⅛ to 12 in.

Steel 12/23/46; *Item No.* 9036

Milling Machine

A higher column which provides greater vertical range is a feature of the No. 22M ram type milling machine announced by Van Norman Co., Springfield 7, Mass. Machine, illustrated below, is designed to bring table nearly up to center line of spindle horizontally. Table size is 50 by 10 in., longitudinal range is 28 in., vertical, 20 in. and cross, 10 in. An adjustable cutter head mounted on a movable ram enables operator to perform any type of conventential milling. Spindle can be furnished with No. 13 B&S taper or No. 40 National Standard taper and its trans-

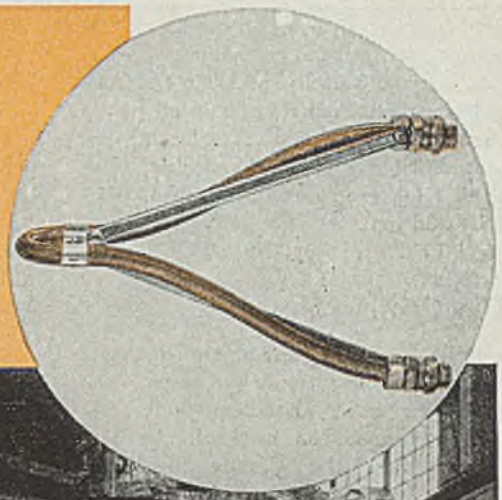


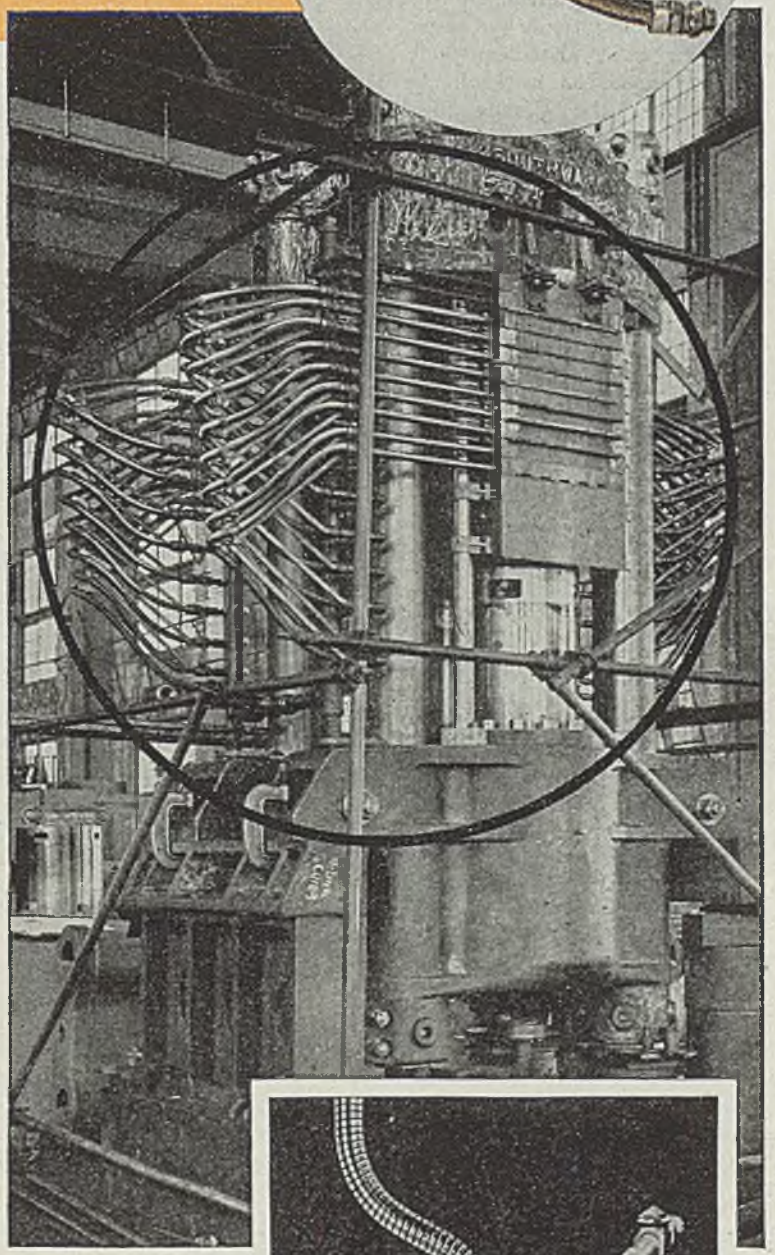


(All claims are those of respective manufacturers, for additional information fill in and return the coupon on page 98.)

Metal Hose

puts the heat on plastics





IN THE HUGE Baldwin Southwark platen press illustrated here, 36 American Bracketubes* insure steam delivery without leaks, without binding swing joints and down time for repacking. Because of their exceptional flexibility, Bracketubes permit platens to move freely. Properly installed, no condensate collects in the lines when the press is not operating.

American Bracketubes are but a single example of the complete range of specialized connectors available in American Flexible Metal Hose and Tubing. Wherever connections must be made between moving or misaligned parts, wherever fluids or gases, hot or cold, must be conveyed under pressure or around bends or both, an American connector will meet the most exacting requirements with economy and long service. For detailed information or technical assistance on your problems, write for literature. 40355

*Patented

ANACONDA

American

METAL HOSE

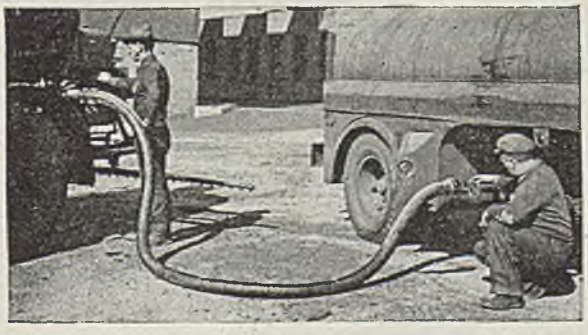
THE AMERICAN BRASS COMPANY

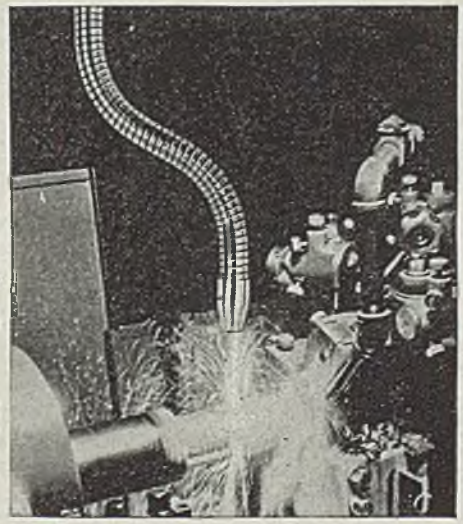
American Metal Hose Branch

General Offices: Waterbury 88, Connecticut

Subsidiary of Anaconda Copper Mining Company

In Canada: ANACONDA AMERICAN BRASS LTD., *New Toronto, Ont.*





Left:
Transferring road oil in Type BD 15 Interlocked Flexible Steel Oil Hose. Available in sizes ½ to 12 inches I.D., for conveying oils, grease, tar, asphalt, other liquids and semi-solids.

Right:
American Flexible Oil Feed and Coolant Lines stay put when bent and direct a continuous flow of cutting oil exactly as required.

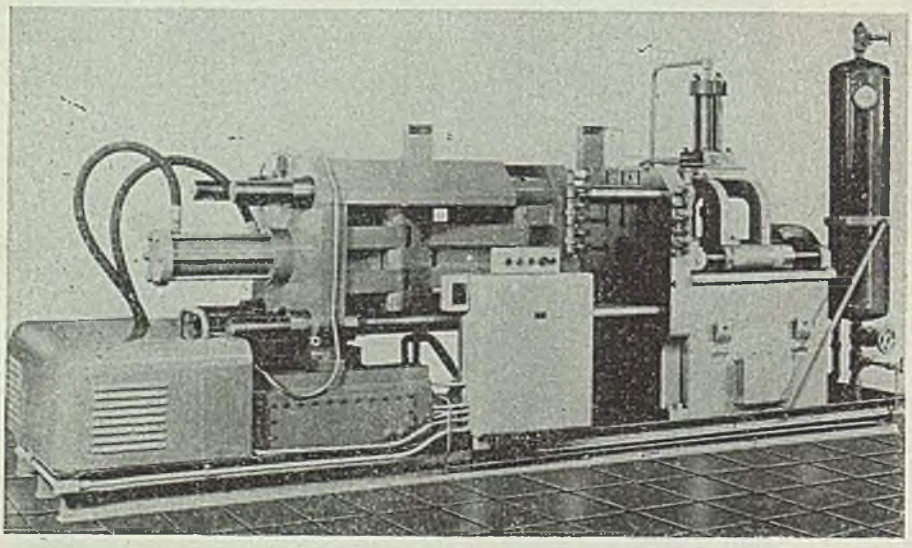
mission roller bearings permit greater load carrying capacity. Machine has front and rear directional controls of all power feeds with provision for locking in neutral. Nine speeds are possible, from 40 to 1100 rpm as well as 12 feeds from 0.5 to 36 ipm.

Steel 12/23/46; *Item No.* 9033

Die Casting Unit

Fully hydraulic, self-contained model M-114 Hy-Mac pressure die casting machine for zinc, aluminum and brass alloys is announced by Hydraulic Machinery Inc., Die Casting Machinery Division, 12825 Ford road, Dearborn, Mich. Machine is constructed so that the furnace can be interchanged for either zinc or aluminum and brass alloy production.

Installation of plunger is accomplished in a few minutes without bolts or other loose parts. Welded construction of base assures complete rigidity of machine and perfect alignment of dies at all pressures. Furnace is designed and insulated to maintain fuel cost at a minimum.



Size of die plates from center to center of bars is 24 x 24 in. while size of die plates between bars is 20 x 20 in. Die opening is 10 in. Pressure per square inch for zinc is 6000 lb and for aluminum and brass, 16,000 lb. Locking pressure is 400 tons. Capacity of melting pot for zinc and brass is 500 lb twice that for aluminum.

Steel 12/23/46; *Item No.* 9755

Testing Switch

Switch for rapid testing of switchboard instruments, meters, and relays from front of board is announced by Westinghouse Electric Corp., Pittsburgh 30. Designed with as many as ten elements, and rated at 250 v, 30 amp, combinations of current and potential switches are included as required for various types of instruments to be tested.

Flexitest switch is semiflush mounted on steel panels. Individual switches are of knife blade type and separated by barriers. Switch handles are recessed for inserting identification cards. Each is drilled for insertion of an interlocking bar to tie together any three adjacent handles. The right hand switch, when used for a trip circuit, is provided with a red handle for easy identification.

Steel 12/23/46; *Item No.* 9844

Drill and Reamer Holder

Made from drop forged alloy steel and of a design to withstand impact and strain, an adjustable drill and reamer holder manufactured by Boyar-Schultz Corp., 2110 Walnut street, Chicago 12, has hardened and ground mating surfaces, bore and shank, which promote quick, easy adjustments.

Tool breakage from drawing set screw down tight on bushing is eliminated as head is made for extra strength with heavy set screw boss. Holder is made in three sizes—No. 00, No. 0 and No. 2 with either long or short shank being available in first and last mentioned.

Steel 12/23/46; *Item No.* 9838

High Speed Chuck

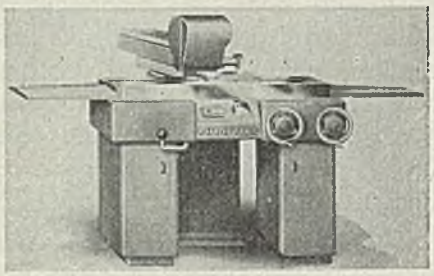
High speed production chuck for drill presses and hand tools which permits quick tool changes without shutting off the power tool is a recent development of Rayco Mfg. Co., Chicago 15. Chuck utilizes principle of centrifugal force to move a ground and hardened driver into adapter slot.

Upward movement of outer sleeve of chuck releases centrifugal drive and tool is ready for use. Tool changes are made at speeds up to 20,000 rpm. Design of chuck and adapters makes tool self-centering. It operates in all positions at any speed.

Steel 12/23/46; *Item No.* 9861

Broach Sharpener

Tool grinders may sharpen flat surface broaches several feet long while seated comfortably at the new broach sharpening machine, illustrated here, developed by Colonial Broach Co., Box 37, Harper Station, Detroit 13. Machine consists of three pedestals, two of which support the table at either side, forming

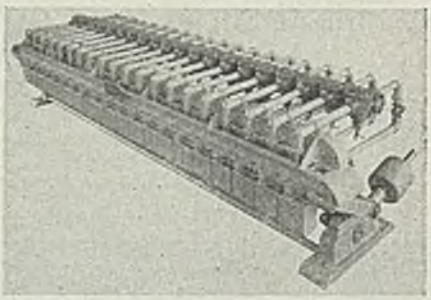


a deep knee hole at back of which is the third pedestal supporting the grinder head. Two hand wheels for controlling lengthwise movement of table and for raising and lowering grinder head are located right side of knee hole. Main operating control is a lever with which grinding wheel is moved across face of broach teeth. It is mounted on front of machine within easy reach. Grinding wheel can be operated at various speeds ranging from 4000 to 10,000 rpm through use of interchangeable pulleys.

Steel 12/23/46; *Item No.* 9034

Welding Preheater

Reduction in welding time is realized by preheating formed strip under a line of Superheat burners made by Selas



Corp. of America, Philadelphia 34. With this method tubing can be made from hot-rolled stock, edge trimming being eliminated. Preheater illustrated here, is designed for speed of more than 100 fpm. Stock is received from forming rollers, heated to 2000°F, and discharged to welder. Equipment consists of 20

(All claims are those of respective manufacturers, for additional information fill in and return the coupon on page 98.)