Published by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio, E. L. Shaner, President and Treasurer; G. O. Hays, Vice President and General Manager; R. C. Jaenke, Vice President; F. G. Steinebach, Vice President and Secretary; E. L. Werner, Assistant Treasurer.

Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers' Association.

Published every Monday. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $6; two years $10; all other countries, one year $12. Single copies (current issues) 25c. Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879.

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STEEL

The Magazine of Metalworking and Metalproducing

Vol. 119, NO. 12 SEPTEMBER 16, 1946

NEWS

TECHNICAL

FEATURES

MARKETS

NEXT WEEK...

Machinability of Two NE Steels

Upsetting Aluminum Cylinder Heads

Plastic Packaging of Machinery

Radiant Heating System Uses Forty Miles of Piping

Braze-Welding Damper Windings

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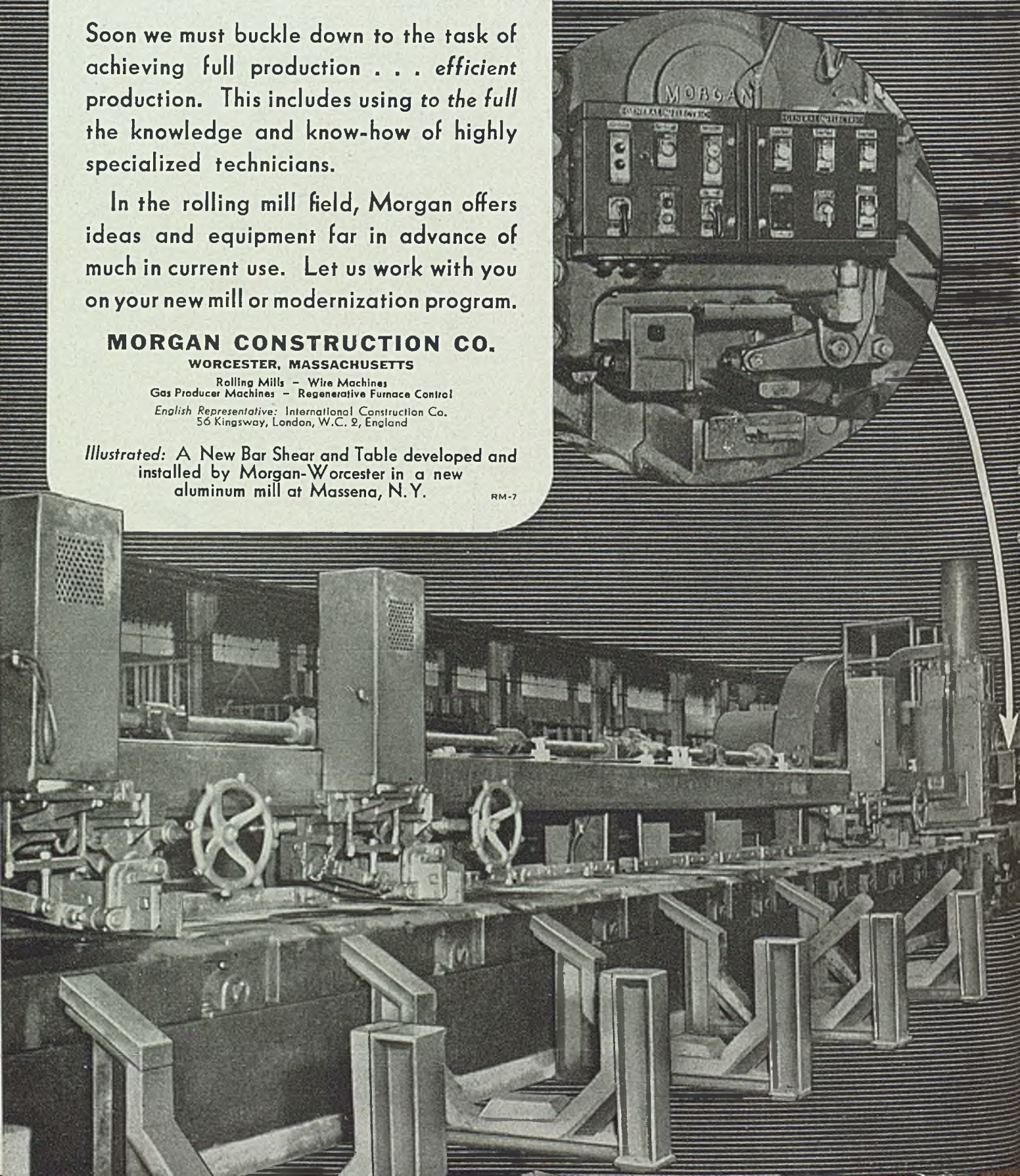
Illustrated: A New Bar Shear and Table developed and installed by Morgan-Worcester in a new aluminum mill at Massena, N.Y.

RM-7



As the EDITOR VIEWS the NEWS

Futile Washington

Something more devastating than the recent break in the stock market will be necessary to shock official Washington into realizing that economic conditions are going from bad to worse and that much of this unhappy condition is due to bungling on the part of government agencies.

Today millions are idle because maritime workers are striking to force a government board to reverse a wage decision. The automobile industry is appealing to the government to take drastic steps to relieve an acute shortage of lead—caused by a complex series of government subsidies, price rulings and import restrictions—which threatens to slow motor car production. Concurrently manufacturers everywhere are complaining bitterly about their inability to obtain steel and are wondering what can be done to relieve the present intolerable situation.

The quick answer is that little can be done until the government decides whether its job is to deal with realities or to prepare for the deflation its leftwing contingent has been forecasting since V-J Day. While President Truman, by his refusal to inject the government into current squabbles, undoubtedly is trying belatedly to get the government out of business, the second echelon of government officials is building up bureaucratic forces to combat the deflation which they insist is in the offing.

A case in point is the steel shortage. Production of steel ingots in August was at a postwar high. But largely because steel producers earlier in the year lost 15,000,000 tons of ingot output through strikes, demand far exceeds supply. Currently the major threat to continued high production is a shortage of scrap. Two weeks ago the Scrap Industry Advisory Committee recommended that OPA increase the price of scrap—the obvious remedy after all others had failed. OPA toyed with this recommendation two weeks and then came out with a "final decision" that the price of steelmaking scrap will not be increased and that a six-point program to curb hoarding will be inaugurated. Instead of stimulating the supply of scrap, OPA chooses to add to the complexity of controls, to swell the ranks of OPA personnel and in effect to make a bad situation worse.

This nation will not emerge from its economic doldrums until Washington realizes that its academic experimentation with fancy theories is futile and that the thing to do for the good of everybody is to hand back industrial problems to the hard-boiled, practical industrialists who—despite their faults—do know how to get things done.

STEEL, September 16, 1946

TOO MUCH RED TAPE: An acute shortage of lead threatens to slow automobile production. Most motor car manufacturers have barely enough to carry them through September and at present the outlook for October is so alarming that the automobile industry has outlined the situation to Reconversion Director John Steelman in the hope that emergency steps can be taken to relieve this bottleneck.

The lead mess is complicated. Total United States demand on a restricted consumption basis is 80,000 tons a month. Domestic mine output is averaging under 30,000 tons per month. Of this total, 25 per cent goes to the Metals Reserve Corp. for allocation. Normally scrap lead comes into the market at the rate of 25,000 tons monthly, but this source has been almost dried up by OPA policies. Imports are disappointing, partly because the United States seems to have made a deal with Great Britain to restrict imports to 7500 tons monthly and also because Metals Reserve's purchases in world markets, even at prices above domestic ceilings, have proved ineffective to date.

Every source of lead—mine output, scrap and im-

(OVER)

ports—is strangled by government regulations, ranging from queer subsidies affecting mines, through intricate price nonsense to dubious "agreements" with foreign nations.

Obviously too many bureaus are working at cross purposes. Here is a spectacular opportunity for Mr. Steelman to cut some badly snarled government red tape. —p. 81

° ° °

NEW ASSEMBLY LINE: American Locomotive Co. has set up a new plant at Schenectady, N. Y., for the production of a new line of diesel-electric locomotives on a mass production basis. The locomotives are assembled from parts and subassemblies in four days. Previously assembly required two weeks.

It is somewhat lamentable, although fully understandable, that the advent of an assembly line in a locomotive shop is in connection with diesels instead of the traditional steam locomotives. Perhaps the precedent of mass production of internal combustion engines in the automobile and aircraft fields helped achieve for diesel locomotives a production technique that long was denied the steam units.

Interesting is the ratio of two diesel electrics to one steam locomotive on Alco domestic order books. Five locomotives are scheduled for shipment to Europe to every one ordered for domestic account. —p. 66

° ° °

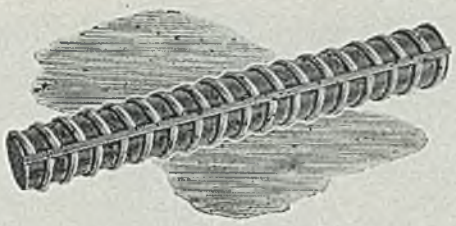
BELATED IMPROVEMENT: From the standpoint of American industry, the more positive foreign policy which the United States government seems to be developing is all to the good. Recent conferences between representatives of the State Department and of other departments and agencies are beginning to show results. The address of Secretary of State Byrnes at Stuttgart at last provides a clearer outline of policy—one which will help our long-puzzled diplomatic and military officials in distant outposts all over the world to pursue their difficult jobs more intelligently and with greater confidence.

Eventually this more positive policy, if it continues to be developed along sound lines, will be of great importance to American manufacturers. Right now the opportunity for private enterprise to participate in the tremendous job of rebuilding the war-torn world is limited almost everywhere by diplomatic impasses. Only by pursuing a clear-cut and well-understood foreign policy that deals adequately with economic affairs, can this nation clear the way for industry to do the job of which it is capable. —p. 74

SIGNS OF THE TIMES: Expenditures for new plant and equipment planned by American business, exclusive of agriculture, for the third quarter of 1946 are estimated at $3.2 billion (p. 84), according to a survey conducted by Securities & Exchange Commission and Department of Commerce. Planned expenditures for the second quarter of 1946 were $2.9 billion and actual expenditures in the first quarter totaled $2.2 billion. . . . From southern California comes a warning that because metal trades industries on the Pacific Coast pay higher wages than those paid in any other industrial area in the country (p. 87), some eastern corporations which started with extensive expansion programs in California during and since the war have had to alter their original plans, confining operations to assembly rather than to production activities. . . . The Bureau of Mines has placed orders for equipment for a coal hydrogenation plant at Louisiana, Mo. (p. 76), designed to produce 200 barrels of synthetic liquid motor fuel daily. This contract, in conjunction with an earlier one for retorts for distilling oil from shale at Laramie, Wyo., constitutes a modest start in the development of synthetic motor fuel and shale oil industries in this country. . . . In testing forged rotor coil retainer rings for turbo-generators, Allis Chalmers Mfg. Co. not only exposes signs of weakness if such exist (p. 96) but also strengthens the rings by plastic deformation, which is a new and unique function of testing. . . . Labor turnover and absenteeism continue to plague management in the metalworking industries. Absenteeism for the Tuesday following Labor Day in the five passenger car manufacturing divisions of General Motors (p. 82) was 10 per cent —about double the average for this year and four times the rate prior to the war. . . . Numerous iron and steel products have been added to the positive list of commodities requiring licenses for export (p. 77) by the Office of International Trade, Department of Commerce. . . . Dr. R. E. Zimmerman, vice president of research and technology, United States Steel Corp., declares that "steel is firmly entrenched in the kitchen, laundry, bathroom and basement" of American homes (p. 78) and "is winning its way into dining and living rooms, bedrooms and sun rooms." . . . War Assets Administration has committed the faux pas of printing large runs of circulars for distribution in South America in Spanish (p. 77), apparently unaware of the fact that the language of the largest country, Brazil, is Portuguese.

E. C. Shaner

EDITOR-IN-CHIEF



Construction Industry Gains by Inland Action

New Licensing Program Increases Availability of HI-BOND Reinforcing Bars*

Inland Steel Company, realizing the tremendous demand for its Hi-Bond Reinforcing Bar for necessary post war construction, is granting licenses to other steel manufacturers to make this greatly improved reinforcing bar. We believe this announcement will be good news to thousands of architects, engineers, and contractors.

With manufacturing licenses being granted to other plants, greater tonnage of this superior reinforcing bar will be made available for increased construction from coast to coast. The construction industry will now have more Hi-Bond for use in buildings, bridges, dams, highways, and other reinforced concrete structures.

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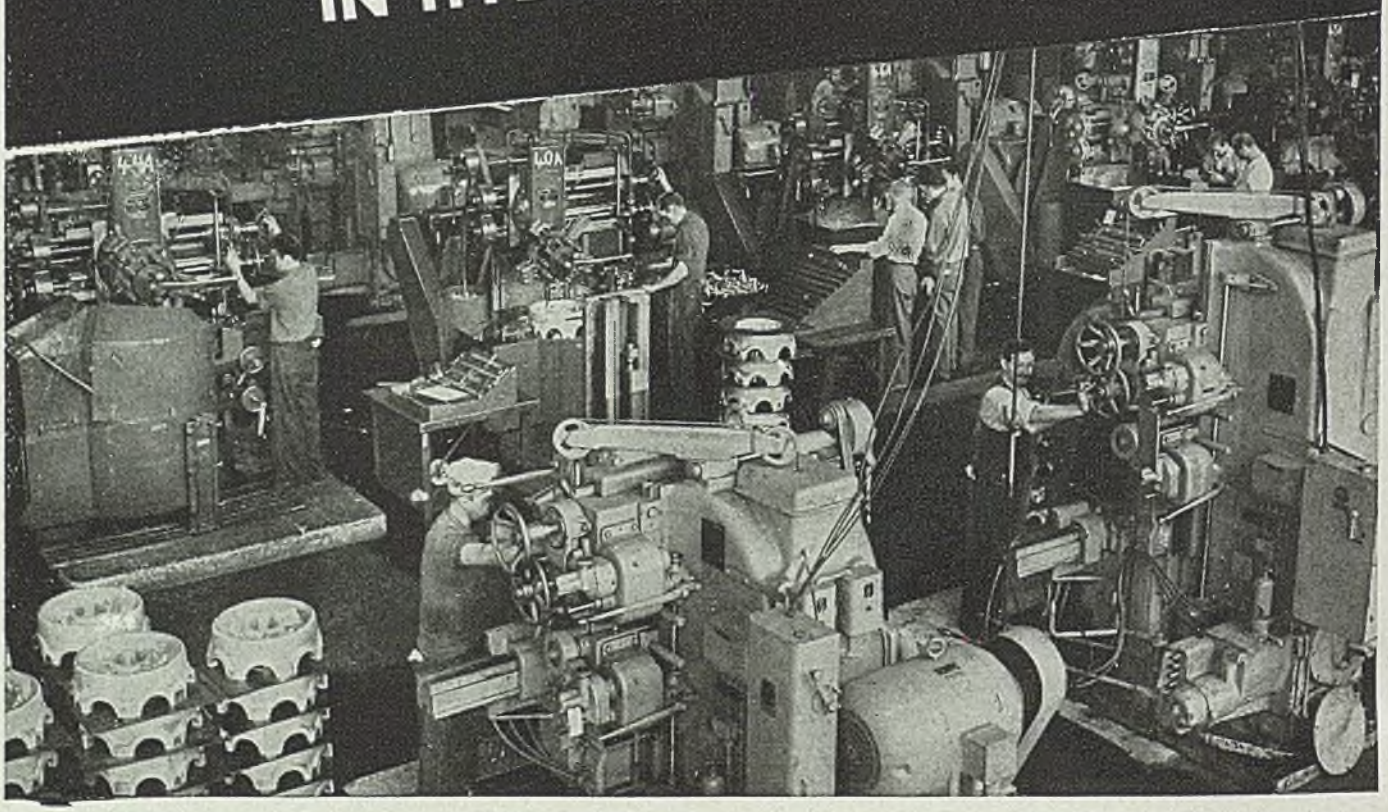

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Rail Freight Car Shortage Acute

Crisis seen developing within next month as carloadings reach seasonal peak. Carriers have 40,000 fewer cars than year ago

STEEL
September 16, 1946

First of an entirely new line of Alco-GE diesel-electric locomotives, and the 75,000th built by the American Locomotive Co., will make its debut to the railroad industry on the private siding of the Waldorf-Astoria in New York, Sept. 22. Two of the locomotive's three 2000 hp units are shown on a recent trial run. Other units in the line include a 4500 hp freight locomotive and a 1500 hp unit for road and switching service

AMERICAN railroads during the next month will face their greatest postwar traffic problem. Demand for cars by mid-October is expected to reach a seasonal peak of 1,000,000 weekly, while the carriers' capacity with present equipment is estimated at 925,000 cars weekly.

These forecasts, by the Office of Defense Transportation, indicate a backing up of 50,000 to 75,000 cars of freight weekly, unless the railroads, shippers and receivers are able to work some magic to avert the threatened crisis.

While the probable traffic jam immediately ahead is the focal point of shippers' interest, the railroads are perhaps more concerned with the long-term problem of rehabilitating their equipment, badly deteriorated by extraordinarily heavy traffic and limited replacements during the war years.

The job accomplished by the railroads during the war is no longer news but still is a source of pride to the carriers. Despite severe limitations on materials for equipment and repair, the railroads handled "the greatest mass movement of men and materials in the history of mankind." When the war ended, the carriers, with finances bolstered by five years of unusually heavy traffic, hoped to modernize and rehabilitate rolling stock. These equipment programs, however, soon encountered serious obstacles.

In the first place, strikes tied up plants producing materials needed for new car construction and repair. Steel and lumber were especially short.

Second, wage increases in supplying industries increased costs of equipment beyond original estimates. Later, wage increases forced upon the railroads themselves increased operating costs.

Third, the freight rate increase allowed by the Interstate Commerce Commission in June was considered inadequate to compensate for the wage increases which the carriers had granted. The roads were given an average rate increase of 6½ per cent which was estimated to increase railroad revenues by $390 million annually, while the wage increase granted is costing about $800 million annually.

This to a large extent has nullified the heavy volume being moved by the carriers. During the first seven months of 1946, Class 1 railroads had an estimated net income, after interest and rentals, of $11 million, compared with a net income of $393 million in the corresponding period of 1945. The 1946 net income figures reflect carry-back tax credits taken by some roads. Without the carry-back credits the Class 1 railroads in the first seven months had a $42 million deficit.

The shortage in freight cars has been developing steadily but only now is it becoming actually acute. Car shortages existed in some areas in 1943 and 1944 while actually for the country as a whole there were car surpluses.

These apparent shortages resulted from a lag in the distribution of cars.

By the middle of June this year, the car shortage exceeded the surplus by 1500 cars. By mid-July, shortages exceeded surpluses by 5000 cars, and by mid-August, by 20,000 cars.

The railroads on Aug. 1 had 40,000 fewer serviceable railroad-owned cars than when the war ended. More than 80,000 cars are awaiting repair.

At the beginning of September, the Class 1 carriers had 57,378 new freight cars on order. During the first eight months of the year 27,703 new freight cars had been placed in service.

The situation in locomotives is less

critical than in cars, and in fact is less critical now than during the war. Rai roads now are holding a greater percentage of locomotives in storage than during the war. However, many of these locomotives are old types whose efficiency is far below that of the modern locomotives and the roads are anxious to replace their older units as rapidly as possible.

Class 1 carriers, as of Aug. 1, had 604 new locomotives on order, and during the first seven months of the year had put 233 new locomotives in service. Of the latter, 66 were steam and 167 were diesel. New locomotives installed in the same period last year totaled 367, of which 56 were steam and 311 were diesel.

The railway car shortage has been accentuated since the war ended by several factors outside the control of the carriers. Major among these factors have been the postwar strikes which disrupted normal traffic. For example, the coal strike last spring made large numbers of coal cars idle for weeks; when the strike ended, a heavier burden was placed on the available cars to move the coal to points where it was urgently needed. With two months lost during the strike, the total requirements had to be moved in a shorter period.

Other strikes caused similar disruptions. The partial tieup of Great Lakes freighters in August caused a loss of time for cars carrying ore and coal. The truckers' strike in New York caused some cars to be tied up there. The maritime strike necessitated a ban on freight car loadings for seaports.

Labor troubles also are to some extent nullifying the 7-point program ordered by Reconversion Director Steelman, in co-operation with other federal agencies, to avert the autumn transportation crisis.

One of the points in its program called for the diversion of cross-country traffic from rails to ships, for coastwise or intercoastal shipping. The War Shipping Administration and the Maritime Commission were called upon to make more vessels available for such shipments, and the Office of Price Administration ordered to give relief for any increase in costs resulting from the diversion. The maritime strike effectively blocked such action.

Shortening of the turn-around time for cars is one of the chief means by which it is hoped to ease the car shortage. The Office of Defense Transportation, the Association of American Railroads and the National Association of Shippers Advisory Boards have appealed to shippers and receivers to step up their loading and unloading operations and to keep shipping departments on a 6 or 7-day week. Considerable relief is resulting from these efforts, but shippers report men in shipping departments are reluctant to work the extra days. And, of course, costs are increased materially by the necessity of paying such workers premium rates.

As the railroads view it, their immediate problem is to do the best they can with what equipment they have. They will depend largely on expeditious handling, by speeding up repair of bad order cars and reducing the turn-around time.

For the longer pull, they hope for freight rate relief to put them in better earning position to finance a fairly large program of equipment modernization.

Means of keeping essential supplies moving during the truckers' strike in New York was advocated at this meeting of union leaders, employers and mediation officials. At head of conference table is Mayor William O'Dwyer. NEA photo

Assembly Line Locomotive Output Started by Alco

American Locomotive Co., Schenectady, N. Y., has set up a new plant for the production of an entirely new line of diesel-electric locomotives on a mass production basis. The locomotives are assembled from parts and subassemblies in 4 days as compared with 2 weeks previously.

The new line includes 2000 and 1500 hp units for passenger, freight and switcher service. A 3-unit, 6000 hp locomotive has just been completed and will go into service shortly on the Santa Fe.

During the war the American Locomotive Co. operated several new plant buildings for the Ordnance Department for the production of tanks and guns. These have been purchased from the government, stripped of their wartime equipment and re-equipped with entirely new machine tools, heat-treating furnaces, welders, and the like, for production of diesel engine parts, underframes, side frames, roof sections, etc. Engines, sections and subassemblies flow to the 230,000 sq ft erecting shop for final assembly. Production schedules call for one complete unit per day by Jan. 1 and 3 a day by July 1, 1947.

Railroad diesel engine production has been transferred from the McIntosh-Seymour Division at Auburn, N. Y., to Schenectady. Wearing parts of the 16-cylinder and 12-cylinder engines are interchangeable. Both engines are of 4-cycle, V-type design with 9-in. bore and 10½-in. stroke. Electrical components, including motors, generators, switchgear and the like, are built by the General Electric Co.

Alco now is producing 2½ steam locomotives to one diesel electric, including exports. Domestically, production is in the ratio of 2 diesel electrics to 1 steam locomotive. Order backlog for steam locomotives extends through third quarter of 1947 and for diesel-electrics well into 1948. Employment now is 8000, against a war peak of 13,000 and 1300 on Oct. 1, 1940.

Holds Lower Costs Result From Diesel Power Usage

Use of diesel power can be a material aid to lowering production costs, in the opinion of Gordon Lefebvre, president and general manager, Cooper-Bessemer Corp., Mt. Vernon, O. Citing improvements in the operating efficiency of diesel engines as a result of war experience and research, Mr. Lefebvre said that these improvements will make possible vast savings in power production, rail, water and road transportation, and industrial uses such as dredges, compressors, bulldozers, etc.

Wage Stabilization Faces Test

WSB holds increases to maritime workers must remain within established pattern. Coal miners and operators discuss return of mines to private owners

TRANSPORT strikes which virtually paralyzed America's sea-borne commerce, seriously disrupted internal transportation, and caused a large loss of employment and inconvenience in New York city held the labor spotlight last week.

The future of the already weakened wage stabilization program was at stake in the strike of two American Federation of Labor maritime unions to protest against a ruling of the Wage Stabilization Board that wage increases for maritime workers must be held within the limits of established rates and disallowing increases which had been agreed upon by ship operators and the AFL unions. Last Wednesday, the WSB reaffirmed its stand against the increases given AFL unions and ruled in effect that these should be "rolled back." The AFL maritime workers threatened to continue the strike "to the bitter end" and late in the week the dispute appeared to be heading for the White House.

The paralysis of shipping had caused an embargo to be placed on nearly all rail shipments to salt water ports. Supply lines to American troops abroad were severed. The flow of raw materials and other imports from abroad became a trickle.

In New York city a strike by truckers, demanding a 30 per cent wage increase, halted the flow of food and supplies. Many industrial plants in the area were forced to close down when their supplies of raw materials ran out. Tens of thousands of workers were laid off.

Communistic Elements Accused

Mayor William O'Dwyer of New York accused Communist elements of stirring up the rank and file of truck drivers to revolt against their leaders and prevent settlement of the dispute. Late in the week Daniel J. Tobin, president of the AFL teamsters union, ordered 10,000 sympathizing workers not involved in contract negotiations to abide by their contracts and return to work.

In Washington, coal mine operators met with John L. Lewis of the United Mine Workers and government officials in an attempt to evolve a settlement under which the coal mines could be returned to the private owners. Adm. Ben Moreell, coal mines administrator, proposed as "a basis for discussion" that the new agreement include the wage rates paid by the government, which are $1.85 a day over the 1945 contract. Mr. Lewis then asked the operators to "make an offer" and indicated that the miners had no concrete proposals at present.

Elsewhere on the industrial front strikes were taking their toll of production.

At Detroit, the Dodge Truck plant of Chrysler Corp. was closed when the UAW picketed the plant in protest to a one-day layoff of 700 workers necessitated by a shortage of steering gears. Strike was settled later in the week.

Hudson Motor Car Co. assembly lines were closed temporarily and 12,000 made idle by a strike of 37 inspectors who demanded an increase of 5 cents an hour.

Main plant Timken-Detroit Axle Co. suspended operations when UAW struck in protest against disciplinary action against 30 employees.

Republic Steel Corp. at Cleveland, suffered a loss in production when about 50 men walked off the job in the open hearth department in protest against disciplinary action resulting from refusal of a crew to make up the bottom of an open hearth.

Employment Average Rises In Steel Industry in July

Employment average in the iron and steel industry was higher in July than in any month since December, 1943. The July average, according to the American Iron & Steel Institute, was 585,100 persons, compared with 578,000 in June and 604,730 in December, 1943.

Also up in July were the industry's total payrolls, average hours per week of wage earners, and average earnings per hour of wage earners.

Total payroll for July was $137,988,900, compared with $125,589,900 in June; average hours per week of wage earners increased to 36.9 hours in July, compared with 34.6 hours in June; and average earnings per hour of hourly, piecework and tonnage workers was 135.1 cents an hour in July, compared with 134.4 cents an hour in June.

Present, Past and Pending

■ CLOSING OF BIDS ON BLAST FURNACE PLANT DELAYED

CHICAGO—To allow new bidders time to prepare bids, the War Assets Administration again has postponed closing of bids on the $34 million surplus government-owned blast furnace plant at East Chicago, operated during the war by Inland Steel Co. Closing date now is Oct. 15.

■ TEXAS BLAST FURNACE MAY BE REOPENED SOON

DAINGERFIELD, TEX.—Lone Star Steel Co. expects to reopen soon the 1250-ton blast furnace at its $25 million plant here. Because of "abnormal conditions" a premium price on pig iron would be necessary for operation of the furnace, the company says.

■ PROPOSALS FOR ENDING CANADIAN STRIKE REJECTED

TORONTO, ONT.—Canadian steelworkers last week rejected government proposals for settlement of the steel industry strike. Union officials said their acceptance of any wage formula would have to be conditional upon prior acceptance by the companies of arbitration on nonwage issues.

■ GOVERNMENT BLAST FURNACE TO BE RELIGHTED

BIRMINGHAM—Operation of the government-owned 1000-ton blast furnace adjoining the Republic Steel Corp. plant at Gadsden, Ala., is to be resumed immediately under government subsidy of $8 a ton.

■ $11 MILLION NATURAL GAS LINE APPROVED

ST. LOUIS—The Federal Power Commission has authorized the Mississippi River Fuel Corp. to construct a $11,574,000 natural gas line between Monroe, La., and St. Louis to increase the latter's natural gas supply by 40 per cent.

■ CONTINUOUS TERNE PLATE COATING LINE PLANNED

PITTSBURGH—Carnegie-Illinois Steel Corp. has awarded Aetna-Standard Engineering Co., Youngstown, a contract for a 48-in. continuous strip terne plate coating line for Carnegie's works at Gary, Ind. The new unit will enable the company to ship terne plate in coils of considerable length.

■ BRASS MILL COMMITTEE "STRIKES" AGAINST OPA

WASHINGTON—Brass Mill Industry Advisory Committee adjourned its meeting here last week and abandoned future meetings "until government ends its pricing inaction on urgently needed raw material." The committee claimed it is unable to get necessary raw materials because Office of Price Administration ceilings are too low for the suppliers.

Impasse in Scrap Held Unrelieved

Trade views latest government moves as discouraging flow of material. OPA's denial of general price increase dismays dealers. Inventory controls seen difficult to enforce. Bartering prohibited

SOLUTION of the steel scrap supply problem seemed farther away than ever last week following joint action of the Office of Price Administration and the Civilian Production Administration denying a general price increase and establishing new inventory, trading and consumption regulations designed to spur the movement of scrap in normal channels.

The 6-point program, aimed at halting hoarding, was viewed in trade circles as only contributing to the confusion and the consensus was that, if anything, the situation would worsen.

Chief disappointment to the trade was the failure of OPA to heed the advice of its Scrap Industry Advisory Committee to grant a general price increase to offset accumulated cost boosts over the past several years. Scrap prices have been held frozen since the beginning of the war. Further, the view was expressed in the trade that the new inventory and trading regulations would be impossible to enforce and would not stimulate the flow of material. Granting of an incentive increase averaging $4 per ton on cast scrap, however, was seen as likely to spur movement of these grades.

Program Termed "Final Decision"

The OPA program to relieve the present acute scrap shortage was termed by OPA Administrator Porter his "final decision" to end the long controversy of scrap ceiling prices that has virtually halted trading in scrap.

New Civilian Production Administration regulations to implement the program will be designed to bring about full scale resumption of normal scrap circulation. It was indicated that the new CPA regulations will require processors of scrap to balance shipments with receipts.

Inventory control is not expected to become effective for at least a week or ten days, at which time CPA will issue a directive. However, talk in Washington last week was to the effect it is possible such a directive may not be necessary, depending upon the degree of co-operation on the part of the scrap dealers in balancing receipts with shipments.

The incentive increase for prepared grades of cast iron scrap comprising 10 to 15 per cent of the total iron and steel scrap supply will average slightly less than $4 per gross ton and is the only price increase provided in the program. Mr. Porter made it clear no general increase in scrap prices may be expected.

The new cast scrap ceiling price schedule, which became effective Sept. 11, is as follows:

Grades	°Zone A	°Zone B	°Zone C
Cast No. 1	$23.00	$24.00	$25.00
Cast No. 2	19.00	20.00	21.00
Cast No. 3	18.00	19.00	20.00
Cast No. 4	15.75	16.75	17.75
Cast brake shoes	15.75	16.75	17.75
Stove plate	21.00	22.00	23.00
Clean auto cast	25.00	26.00	27.00
Motor blocks, unstripped	18.00	19.00	20.00
Wheels No. 1	20.00	21.00	22.00
Malleable	22.00	23.00	24.00

° Zone A includes: Montana, Idaho, Wyoming, Nevada, Utah, Arizona and New Mexico. Zone B includes: North Dakota, South Dakota, Nebraska, Colorado, Kansas, Oklahoma, Texas and Florida. Zone C includes: All other states including the switching district of Kansas City, Mo.

Other phases of the program:

(1) Establishes ceiling price for the first time on sales of unprepared scrap to scrap dealers from industrial or government sources. These new ceilings are the levels as formerly applied to sales of similar materials to consumers or their brokers which will give dealers a basic gross margin of $3.50 per net ton, the difference between the new ceiling prices for unprepared scrap and for number one heavy melting steel, the basic grade of prepared scrap.

(2) Reduces ceiling price on sales of unprepared scrap to consumers or their brokers 50 cents per ton which gives dealers a differential to insure the flow of scrap through this normal channel.

(3) Prohibits the purchase or sale of scrap on the condition that the buyer deliver to the seller any other commodity, widely practiced recently. These "tie in" sales—the trading of other scarce materials such as pig iron and new steel for iron and steel scrap—have slowed down the flow of scrap and diverted it from normal channels.

(4) Prohibits sale of electric furnace and foundry grades of scrap at premium prices for use in basic open-hearth furnaces unless the scrap has been allocated by CPA.

(5) Provides incentive increases ranging from $2.50 to $7 per gross ton in the maximum price for prepared grades of cast iron scrap. The increase should encourage collection of this type scrap which may be used as a substitute material for pig iron which is in short supply.

(6) The increased OPA staff of expert graders assigned to scrap will launch a drive for criminal prosecution in appropriate cases of violators of OPA regulations.

Holds Higher Prices Unwarranted

"The decision that no general increase in ceiling prices of scrap is warranted was reached only after the most careful consideration of all factors involved including the recommendation of the OPA Industry Advisory Committee for scrap that a general increase should be granted," Mr. Porter said. "I want to make it clear, however, that the decision is final and I am relying to a large extent upon the co-operation of the Civilian Production Administration in holding scrap inventories down to legal limits. Any general increase in steel scrap prices should be largely a bonus for speculators.

"OPA study shows that the committee in recommending the price increase was influenced largely by other consider-

VALUABLE DUST

A forgotten pile of flue dust containing a substantial amount of iron has made the Milwaukee city government several thousand dollars richer, thanks to today's scrap iron scarcity.

Offered $10 by a scrap dealer who wanted the dust pile on Jones island, the Milwaukee port director became mildly interested in the value of the dust. Immediately he ordered harbor commission workers to cease using the dust for road repair materials.

In his investigation, the port director found that the flue dust, 990 tons of it, had come years ago from blast furnaces operated on Jones island by the Illinois Steel Co.

Soon the port director had another offer, this one for $200, for the dust. Thoroughly interested by this time in the pecuniary value of the dust, the port director asked the city purchasing agent to advertise for bids on it. When the bids were opened the top offer was $3325.

tions than increasing the flow of scrap such as the practice of trading new steel for scrap. Such trading is now being prohibited. Moreover, the committee's advice was followed in imposing ceilings upon sales of unprepared scrap to dealers and the fixing of a differential between these sales and those to consumers."

In addition OPA said that no significant increase in the flow of scrap would result from a general price increase.

The agency explained that bidding up of unprepared scrap by speculators and those desiring to trade in it for new steel has resulted in such high unprepared scrap prices that legitimate margins allowed scrap dealers to cover their preparation costs have been cut greatly and in some cases wiped out. It is recognized, OPA said, that abuses have not been carried on by the entire industry. Moreover, those members of the industry who have been complying with government regulations and helping maintain the stabilization program have been injured by their competitors' abuses.

The ban on use of electric furnace and foundry grades by basic open hearth consumers is designed to end a major source of upgrading. It restores a wartime control that was removed soon after V-J Day to permit freer movement of scrap. Since basic open hearths do not require scrap prepared to these specifications their purchasing of these grades has led to indirect violations of price ceilings by payment of premiums, OPA said.

Mr. Porter explained that the only increase in ceiling prices granted under the new program is designed to increase the flow of cast iron grades of scrap, the use of which is limited largely to foundries.

"Resultant increased costs should be more than offset by increased substitution of scrap for more expensive pig iron," Mr. Porter said.

The price increase should bring out more cast scrap by increasing the small peddlers' operating margin.

Finally, the exercise of inventory control by CPA is part of the government's program to halt hoarding and correct maldistribution of scrap supplies.

Under the CPA program shipbreaking activities will be speeded up. It is understood the War Assets Administration will take bids about Sept. 17 (tentative date) for the leasing of 12 shipyards to be used for shipbreaking. These yards, it is understood, are located in the James River area, the Mobile Bay area, and San Francisco Bay area. At the same time the Maritime Commission is preparing a list of 110 ships to be sold for scrap. These vessels are in addition to the 106 disposed of for this purpose some time ago.

August Steel Output Pace Sets New Postwar Production Record

PRODUCTION of steel ingots and steel for castings during August set a postwar record with output rising 285,797 tons over the preceding month to 6,895,465 net tons, American Iron & Steel Institute reported last week.

The previous high since the end of the war was reached in July of this year with production of 6,609,668 tons, according to revised figures. One year ago production for August was 5,735,317 net tons.

Steel ingot production has increased steadily since May when the industry operated at 52.2 per cent of capacity, turning out 4,072,452 tons. Operations are at the highest level since May of last year, production during August being at an average rate of 88.3 per cent of capacity compared with 84.9 per cent in July and 70.7 per cent during August, 1945.

Last month's output consisted of 6,261,941 tons produced in open hearths, 373,819 tons in bessemer furnaces, and 259,705 in electric furnaces.

Production of steel ingots in the first eight months of this year totaled 40,834,287 net tons which compares with 55,863,970 in the like period of 1945. In the first six months of this year, production was 15,813,928 tons behind that of 1945, the loss being due to plant shutdowns occasioned by strikes and work stoppages in the steel and coal industries. Due to the accelerated production in July and August some of the first half-year's loss has been recouped. Should the August production rate be maintained through the remainder of the year, 1946 production should total over 68 million tons, a record peacetime year if 1941 is excluded.

$1 Million Steel Foundry Offered for Sale by WAA

A million dollar steel foundry in Easton, Pa., operated during the war by Lehigh Foundries Inc., for the production of mortar shells, has been declared surplus and is offered for sale or lease by War Assets Administration. Machinery and equipment on the site include melting and annealing furnaces, compressors, ovens, cranes, and sand handling equipment. Machine tools, including milling machines, presses, lathes and grinders, also are available.

Supply Shortages Preventing Full-Scale Production by Electrical Manufacturers

FULL SCALE production in the electrical manufacturing industry has been postponed for at least another six months and probably longer as a result of shortages of various materials, the National Electrical Manufacturers Association reports following a survey of 100 member companies.

Production of small motors is running about 50 to 80 per cent of capacity in various plants due principally to these shortages. One manufacturer of transformers estimates it will be a full year before copper supply will be fully adequate. Other shortages exist in lead, natural rubber, cotton yarns and cotton sheetings.

Shortages are especially marked in the production of materials needed in the housing field, such as electric wiring, and so forth.

In reply to the Association's questionnaire, one wire manufacturer said that in some lines production could be increased by as much as 40 per cent if the necessary cotton yarns and sheetings were available and that in lead cables production could be stepped up 100 per cent if sufficient lead were to be had.

On the labor situation, the majority of companies declared that labor efficiency was below that of 1941, in some cases running as low as 65 per cent of prewar standard. This was ascribed to a variety of factors. One of the factors cited was that working forces are being increased in many plants and considerable time and effort must be devoted to training new workers. Another factor has been the high turnover of veterans.

Reports from the larger cities stated that the unemployment insurance system was one important factor in keeping women from taking jobs at this time.

Although most companies in the fractional horsepower field are producing far in excess of their 1941 rate because of wartime expansion, such motors remain on the critical list because of the unprecedented peacetime demand.

Iron & Steel Board Members Named; Modernization Program To Proceed

Some observers believe industry will not be nationalized, but that government will exert control through new board, which will supervise development programs, prices, provision of raw materials, production, distribution and imports

LONDON

APPOINTMENT of members of the Iron & Steel Board, which will review and supervise programs for the development and modernization of the industry, prices and other problems, is expected to resolve a deadlock that has gripped the British steel industry since the Labor government announced its nationalization plans in mid-April.

The new board will not advise the government on how nationalization policies are to be carried out. In fact, many observers now believe it is extremely probable the industry will not be nationalized, but will continue to be operated by the various companies. They believe the British Iron & Steel Federation will preserve its autonomy. However, control by the government will be much greater than before the war and this control likely will be effected through the new board.

Naming of the board members is expected to be followed by intense activity in modernization and re-equipment of iron and steel plants along the lines suggested in the Iron & Steel Federation's report, submitted some nine months ago.

Forbes Named Chairman

Chairman of the Iron & Steel Board will be Sir Archibald Forbes, managing director of Spillers Ltd. He will be released from his duties with Spillers to devote his whole time to the board. His salary will be £8500.

His colleagues on the board, who will receive £1000 annually for part-time services, will be: Sir Alan Barlow, a joint second secretary of the Treasury since 1942; A. Callighan, secretary of the National Union of Blast Furnacemen, ore miners, coke workers and kindred trades; Lincoln Evans, secretary of the Iron and Steel Trades Confederation; G. H. Latham, chairman of the Whitehead Iron & Steel Co. Ltd., and president-elect of the British Iron & Steel Federation; and Richard Mather, chairman of the Skinningrove Iron Co. Ltd. An additional member, with experience in general industry, will be announced later.

The duties of the board, as announced by the government, will be:

1. To review and supervise programs of development needed for the modernization of the iron and steel industry and to watch over the execution of approved schemes in such programs.

2. To supervise as necessary the industry in current matters, including the provision of its raw material requirements, and the administration, under powers delegated by the minister, of such continued direct control as may be required over the production, distribution, and import of iron and steel products.

3. To advise on general price policy for the industry and on the fixing of prices for controlled products.

Although demand for steel is still increasing, production in Britain is decreasing. In May average weekly output was 261,800 tons; in June it fell to 239,800 tons and in July 226,000 tons. With August a holiday month it is doubtful whether any improvement will be seen when figures are disclosed. Pig iron production in July was only at a weekly rate of 147,000 tons, as compared with a weekly rate in the three months ended June of 150,500 tons.

Total exports of iron and steel from Britain in July were 236,358 tons, compared with 77,438 tons in the same month last year. In the first seven months of 1946 the total was 1,448,927 tons, compared with 234,680 tons in the same period of 1945. Chief items among exports in July this year were rails, 32,680 tons; wrought tubes, 25,160 tons; sheets, 30,117; and steel bars, 26,061 tons. British re-rollers are using re-rolled steel to an increasing extent and could absorb a much larger tonnage if it were available. In July 19,006 tons of semifinished were brought in, and in addition Britain imported 1355 tons of steel ingots and 1000 tons of pig iron.

A further shrinkage in coal output may have the effect of reducing steel output next winter. All steelworks have backlogs. Export quotas have been cut and producers are hesitant about accepting further new business. Distribution of all coal supplies is subject to government direction and steelworks are not allowed to exceed their fixed quotas. Pressure for deliveries from shipyards, engineering shops, locomotive and freight car works has been intensified. Production of pig iron suitable for the light castings industry is no more than sufficient to meet the needs of the light castings industry, but it is recognized that the potential capacity of the foundry industry is not being used because of a shortage of skilled labor.

In the Welsh tin plate trade there is a heavy demand but only about 30 per cent of the output is being shipped overseas. A small number of mills which have been lying idle have been restarted but the obstacle to bringing more into commission is the acute shortage of labor. Supplies of steel bars and tin to the industry are sufficient to meet the needs. The bulk of the current output of tin plate in Wales is being used in connection with the packing of foodstuffs. The demand for black and galvanized sheets continues extremely heavy.

France To Abandon Industrial Subsidization Policy Gradually

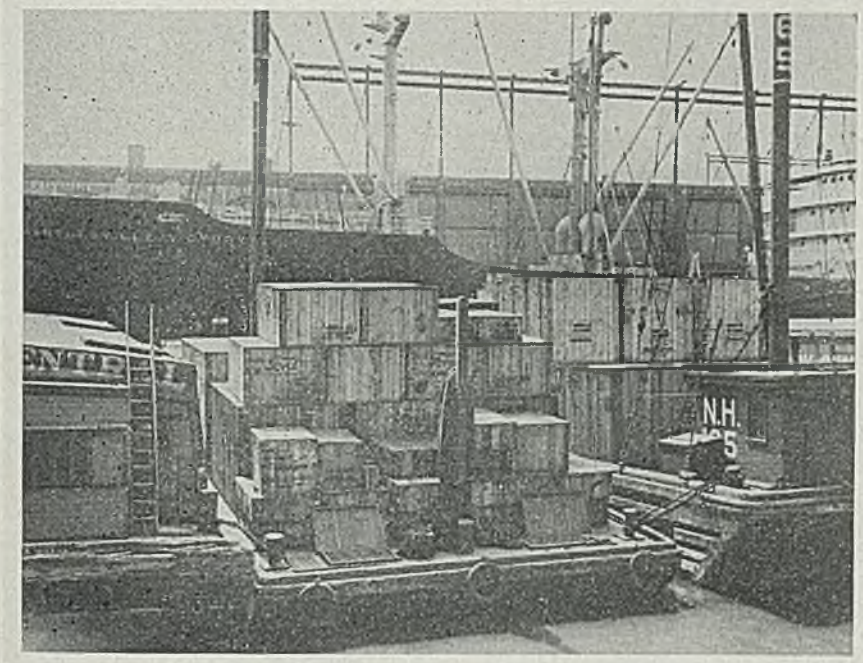
PARIS

GRADUAL abandonment of government subsidization of business and industry will be a policy of France, the Ministry of National Economy has announced.

In foodstuffs, only bread and milk will continue to be subsidized and, in fact, the bread subsidy will be compensated by an increase in the price of gasoline by higher taxation. As regards industrial subsidies, only imports will continue to receive financial assistance from government funds; the existing subsidies to the iron and steel industry will be gradually reduced and will be terminated by the end of the year.

Prices of certain industrial products are still low in relation to the general level, aluminum, for instance. On the other hand, certain high prices are beginning to come down, as has recently been the case for textiles. A new method of controlling prices is to be applied; controls will apply to all products within certain categories, all products within one category being affected at the same time. This has been done already for hardware goods. It is also proposed to establish distribution or allocation committees which will investigate the means of bringing back more healthy conditions in commercial transactions.

Imports of coal into France rose ma-



PROTEST YUGOSLAV CARGO: Crated Ford mobile shop units lie idle on a lighter in New York after stevedores refused to handle them, stating the machinery was bound for Yugoslavia. The men protested against sending supplies to Yugoslavia, said they should go to Greece. NEA photo

terially during July, with a tonnage of 1,089,973 tons against 572,348 tons in June. July imports include 537,327 tons from the United States. Receipts from Germany have also improved, amounting to 304,674 tons from the Ruhr and the Saar. It is the first time since March that the figure of 300,000 tons has been exceeded; it is due to the delivery, somewhat delayed, of 77,200 tons lent by the American and British authorities in June and originating from their stocks in Germany. Coal imports from Poland in July amounted to 104,234 tons; an agreement was signed with Poland on Aug. 1 covering a monthly supply of 100,000 tons of coal.

An interesting situation has developed in regard to coal imports from the United States. The tonnage of 537,327 tons for July compares with 116,904 tons in June. The allocation of American coal for the European Coal Committee (E.C.O.) is 525,000 tons per month; this tonnage is believed to be within the capacity of the United States to export now that the coal mines are producing normally. Certain European nations are not able to take up their quota because of the high cost of American coal; this results in a substantial tonnage being available and offered outside regular allocations. It is therefore possible for France to supplement her needs, but her problem is not only one of quantity but also one of quality or grade. There would be no point in trying to reach the prewar tonnage of imports, amounting to 1,800,000 tons, if the grades of coal imported did not complement those available from the French coal mines. To import coal that is not suitable to French requirements would be wasting foreign exchange. It is therefore probable that in the near future French importers will be directed to purchase certain specified grades of coal only, particularly coking coal.

Improvement in the output of iron and steel is continuing. Nine blast furnaces have been blown in since June 1, and 46 furnaces were in operation at the end of July. The output of pig iron has risen from 264,000 tons in June to 304,000 tons in July. Production of steel ingots and castings has also jumped from 343,000 tons to 377,000 tons, and the output of rolled products from 238,000 tons to 250,000 tons.

Another indication of revival in industry is the increase of coal output in the week Aug. 4-10, to 960,966 tons against 949,113 tons in the preceding week. During the same period imports of coal were 220,175 tons against 201,310 tons in the previous week.

Czechoslovakia

Despite still short supplies of iron ore, which is not of prewar quality, and irregular coke deliveries, the output of iron and steel in Czechoslovakia is steadily increasing, thanks partly to good supplies of scrap. The output of pig iron for the first six months of this year was 424,848 metric tons (806,663 tons in the first six months of 1937); the production of steel ingots was 795,620 metric tons (1,103,151 tons).

The Witkowice works, near the border of Poland, suffered little damage during the war, and is now producing at prewar capacity, which is equivalent to 40 per cent of the total capacity of the country. This works is reported to operate the largest steam hammer in Europe, capable of forging blocks of 150 tons.

Germany

Larger supplies of coal and coke have caused an increase of the output of steel in the zone occupied by the British, the output in July being 210,321 tons, as compared to 177,000 tons in June. The July output is the highest recorded so far.

Italy

Monthly output of steel in Italy is at present estimated at 53,000 tons, comprising 27,000 tons of open-hearth steel and 26,000 tons of electric steel. Italian shipbuilders are anxious to place orders for ship plates from foreign makers owing to the existing scarcity of these products in the home market.

Government To Permit Rail Shipment to Yugoslavia

WASHINGTON

Government officials last week made it clear they planned no interference with projected shipments of materials from this country to Yugoslavia by UNRRA, including 7458 tons of steel rails, despite protestations of Senator Bridges (R., N.H.) and Joseph P. Ryan, president, AFL Longshoremen's Union.

The union has refused to load relief vessels destined for Yugoslavia until "proper action is taken against those responsible for shooting down" two American planes in that country with loss of life last month.

On the question of the steel rails, which Senator Bridges said were valued at $450,000 and had been diverted from shipment to China, UNRRA and the State Department said that about seven weeks ago UNRRA Director General LaGuardia ordered an embargo on all relief shipments to China except foodstuffs, on grounds that the Chinese ports were badly congested and could not handle the supplies. At that time 18,600 tons of steel rails earmarked for China were ready in New York for shipment. Rather than pay storage on them, the rails were allocated to Yugoslavia.

Tumble in Stock Market Studied For Hint of Industrial Trend

Machine tool executives follow security market developments for effect on tool demand. Industrial contraction not reflected in sales. Interest in labor-saving equipment continuing at high level

CLEVELAND

COMPANIES in the machine tool industry are watching developments in the security markets closely since the downtrend there may forecast a contraction of industrial expansion in the near future. There has been no indication yet, however, of a reduction in demand for machine tools.

There is ample display of interest in labor-saving machinery and new firm orders are holding at a satisfactory level. During the last five months for which figures are available, unfilled orders have increased steadily and now total about $185 million. The order backlog this year has included foreign business which has consistently accounted for slightly under 30 per cent of the total. There has been no appreciable increase in cancellations, which would be one of the first signs of retrenchment in appropriations for expansion and modernization programs.

Shortages Hamper Industry

The industry is still hampered in its efforts to increase operations by serious shortages and is encountering rising costs as completion of work-in-process is delayed and costly substitutes of certain materials and components must be made. Producers are accepting delivery of any type of motor that can be found rather than await delivery of motors complying strictly with specifications. Some improvement has been noted in delivery of the larger sized motors but those of motors under 5 horsepower and fractional motors are far behind schedule. Other serious shortages are reported in clutches, centrifugal and hydraulic pumps, and bearings, although delivery of the latter have improved lately.

Malleable iron pipe fittings, such as ½-inch elbows, are especially scarce and hampering the completion of many orders. Shipments from some suppliers are as much as 12 to 14 months behind schedule. Improvement in the availability of this component may be delayed for several months, since the industry understands that plans have been made by the government to channel available supplies of fittings into the housing program.

Shortage of steel also continues critical with many machine tool builders buying substitute materials which often increase costs substantially. Hot-rolled bar stock, for instance, cannot be obtained in sufficient quantities to meet requirements, requiring the purchase of higher-priced cold finished material. Alloy steel is in comparatively free supply.

Automotive Buying Lag Felt In New England Tool Market

Boston—Slack in new orders for machine tools is marked by the absence of buying by the automotive industry. Few machines have been bought for potential model changes expected during first half of next year, although considerable equipment will be required.

Foreign inquiry is heavy and several large lists for export are being estimated.

Shipments with some shops are in excess of bookings, but deliveries on numerous metalworking tools are still extended 16 to 18 weeks; backlogs are still substantial but are being reduced slowly in some cases.

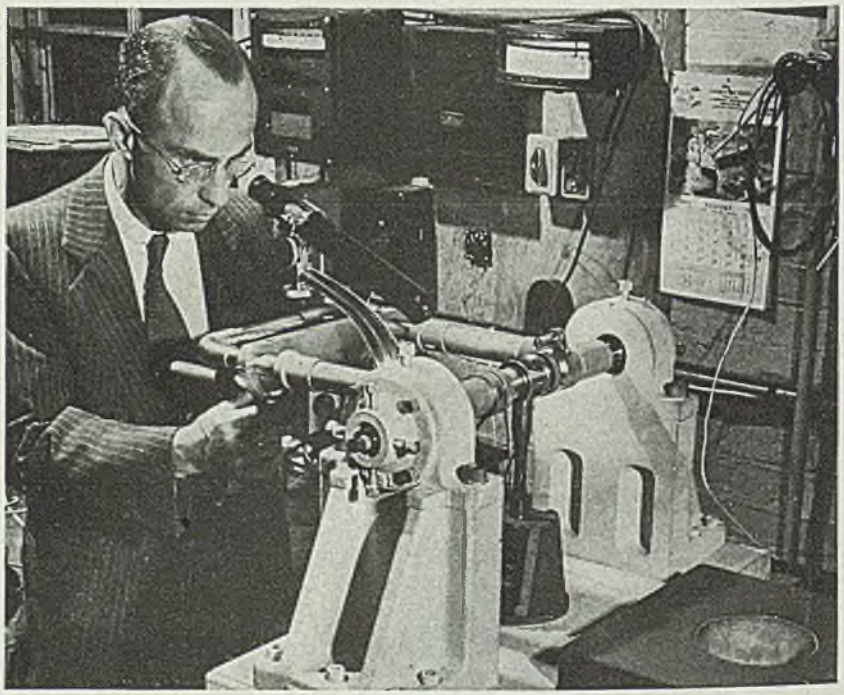
Offerings of surplus machines are heavy in New England and the East. This has unquestionably affected new sales of standard tools, more so than of special equipment. However, some types of machines, internal centerless grinders to name one, are becoming scarce in surplus.

General Electric Co. is planning purchase of considerable new machinery for the Bridgeport, Conn., washing machine plant.

Tool Production Retarded by Supply, Component Shortages

Pittsburgh — Scarcity of steel, components and skilled mechanics continues to retard machine tool output. Some improvement in production has been noted recently, however, and further increase is expected through the remainder of this year.

Industry's order backlogs are extended six months and more on special grinders, hydraulic planers, shapers and slotters; lathes generally are available within four months, while deliveries on hack saws and small hydraulic assembly presses



FATIGUE TESTER: General Electric's pneumatic fatigue-testing machine, which is used to vibrate metals and alloys at their natural frequencies until they crack or break under the stress and strain is demonstrated here by F. B. Quinlan, engineer in the Schenectady works laboratory. Here the engineer is watching the vibration of a piece of steel through the attached optical system

are promised within two to three weeks.

Improved system of registering available equipment has speeded up redistribution of surplus items at WAA sales. A large volume of industrial equipment currently is available to the general public.

Site sales now being sponsored by WAA include: Machine tools, production and electrical equipment at Cleveland Pneumatic Aero Inc., Cleveland, valued at $15 million; machine tools and production equipment at Quigley Avenue warehouse, Cleveland, $25 million; hand tools, office and shop equipment, Goodyear Tire & Rubber Co., Akron, O., $7.5 million; steel, aluminum, shop equipment and machine tools, Army warehouse No. 15, Warren, O., $15 million; Army depot, Lordstown, O., machine tools, production equipment and hardware, $25 million; machine tools, production equipment, three warehouses at Toledo, O., $27 million; commercial diamonds, scales, machine tools and production equipment, Fisher bomber plant, Cleveland, valued at $8 million. The latter sale will not be open to non-priority buyers until Oct. 1.

Moderate Improvements Noted In Tool Deliveries

St. Louis — Moderate improvement continues in deliveries of small standard machine tools. Some lathes are obtainable in 30 to 60 days, and shapers 2 to 3 months. Large lathes range from 3 to 4 months, but punch and drill press deliveries may be a year or more late. Further improvement in cheaper tool deliveries is expected from now until the end of this year.

Demand for new and used tools continues brisk. Cream of standard machines has already been taken from war plant surpluses here, and a number of specialty tools have been pulled back from sales or frozen indefinitely.

Machine tool distributors here report electric motors still are the worst barrier. Many are being queried as to whether they will accept delivery without motors, and some are being shipped in that condition.

Swiss Toolmaker Reported Turning Down Russian Order

Washington — A Russian order for precision tools reportedly amounting to $6 million (with deliveries to be spread over a 10-year period) has been turned down by a Swiss manufacturer along with an offer that the plant capacity be quadrupled at the expense of the Russians, according to the Department of Commerce.

Some Bolt Producers Oversold on Basis of Steel Supply in Sight

BOLT and nut manufacturers are heavily booked ahead. Some makers assert they are oversold for the remainder of this year, on the basis of steel in prospect, by as much as 50 per cent, and it is believed in some quarters, that this situation is not far from average for the industry as a whole.

Meanwhile, in view of this situation bolt and nut producers are trying to avoid making new commitments beyond the end of the year. In the case of certain car construction and some programs of similar character, makers are promising some tonnage, but in general they are turning down orders for next year until they can digest some of the work already on their books.

Principal stringency is in the small assembly items. On the other hand, heavy structural rivets are in fairly easy supply, reflecting the decline in non-housing construction; and shipyard rivets, are a virtual drug on the market, because of the sharp decline in ship construction. In certain cases these ship rivets have recently been loaded on cars and sold for scrap.

Contributing to the relatively easy situation in structural rivets is not only the drop in non-housing construction, but the sizable quantities that are still being offered from government surplus.

Demand for nuts, bolts and rivets for pre-fabricated work has been so heavy of late that makers have been forced to turn down substantial tonnages, as they have been unable to meet the deliveries desired. So far as can be learned bolt and nut makers have not become extensively involved in ratings, applying to the housing program, and in support of this belief steel producers assert that they have received little in the way of CC rated orders from the bolt and nut industry.

Export shipments were recently brought to a standstill by the Maritime strike, and with rail embargoes on export shipments, various bolt and nut makers had a substantial accumulation of material on their loading platforms.

GOVERNMENT CONTROL DIGEST

OFFICE OF PRICE ADMINISTRATION

Jobbing Shop Operations: Effective Sept. 5, any jobbing shop operation formerly covered by OPA's industrial services regulation (MPR-581) is suspended from price control unless it consists "entirely or principally" of abrading, assembling, cutting, forming, grinding, machining, shaping or welding. "Principally" as it applies in this case means more than 50 per cent of the total operation's cost based on the seller's June 30, 1946, maximum price. All repair and maintenance services under this regulation regardless of the nature of the work, are also suspended. (SO-129; OPA-T-4977)

Scrap: Sales of prepared iron and steel scrap to dealers by government agencies have been placed under price control, effective Sept. 16. Sales by government agencies of unprepared iron and steel scrap and all other scrap metals to dealers remain exempt. (SO-94)

CIVILIAN PRODUCTION ADMINISTRATION

Tin Plate: An additional 15 per cent of tin mill production which formerly was channeled to the manufacture of cans and closures for perishable foods and a few other urgent items has been freed, effective Sept. 30. Only 70 per cent of tin mill output must go into the production of the essential products listed in group A, compared with a former restriction requiring 85 per cent of tin mill production for such use. (M-21; CPA-LD-252)

Building Materials: "HH" and "HHH" priority rated orders for iron and steel building materials have been exempted from the emergency suspension of iron and steel ratings. Previously, only "AAA" rated orders were exempt from direction 13 to priorities regulation 1 which, in general, suspends until Sept. 30 all rated orders for iron and steel items.

The direction was further amended to provide that all "HH" and "HHH" rated orders for any iron or steel item listed on schedule A of priorities regulation 33 remain in effect. However, the "HH" and "HHH" rated orders for some of these schedule A items may not be served on producers.

Metal window sash and frames have been restored to the list of materials for which "HH" rated orders may be granted.

CPA Appeals Board will not hear any appeals on construction applications filed with it requesting relief from Veterans' Housing Program order No. 1 or from administrative action taken under that order. (PR-1 and 16; CPA-547).

RFC Metals: New priorities regulation, No. 34, sets forth procedures under which eligible purchasers may obtain metals, minerals and other materials held by Reconstruction Finance Corp. Metals covered by the regulation include in part: Aluminum, antimony, beryl, bismuth metal and alloys, cadmium metal and scrap, chromite, copper, lead and manganese. (PR-34)

Construction Items: Producers of new items, such as aluminum window frames, etc., used in industrially made houses, sections or panels, are eligible for priority assistance if they are attempting to increase production sufficiently to earn premium payments or to carry out production agreements made with the housing expediter. This assistance may be used to obtain not only an item of production material and capital equipment but also maintenance, repair and operating supplies or material for construction. (PR-28; CPA-548)

Pig Iron: Certification plan which aided manufacturers of housing products and railroad brakeshoes in obtaining pig iron during the third quarter of 1946 will be continued for the balance of the year. Aid to manufacturers in obtaining iron castings has been discontinued. Farm machinery products have also been eliminated from the fourth quarter certification plan.

Any manufacturer who receives a rated order from his customer is prohibited from extending this rating to purchase pig iron. Priorities assistance for pig iron will be assigned only under direction 13 to M-21. (M-21, PR-3; CPA-LD-259)

Windows of Washington

More positive foreign policy shaping up in Washington. Greater authority delegated to field representatives and instructions are available more quickly. Foundation laid for foreign economic affairs program by Undersecretary of State Clayton

A MORE positive American foreign policy appears to be developing from a series of conferences of members of the State and other interested departments and agencies over the past several months.

For example, we now appear to have a real program for Germany. Last June we decided to shut down on further reparations shipments out of our zone in Germany. Next the Office of International Trade, with Army co-operation, launched a campaign to interest American importers in buying German goods. Then came the agreement under which the United States and British-occupied zones are to be merged. And finally, Secretary Byrnes journeyed to Stuttgart and committed the United States to a policy of self-government for Germany.

To put it another way, the blueprint for American foreign policy, and the methods for carrying out that policy, are in an advanced stage of development. United States diplomats and Army and Navy commanders from now on should be caught off-base much less frequently. They know what to do, what to say, and when in doubt they can get instructions without delay. When General MacArthur warned that conflicting ideology must not interfere with the democratization of Japan, the State Department came out with a formal statement supporting him.

All this is in marked contrast with the situation of a short while ago when American representatives abroad were subjected to continual embarrassment over their lack of authority.

Of particular interest to business is the fact that for the first time since we became a nation we now have an undersecretary of state for foreign economic affairs. Shortcutting legal phraseology, the new undersecretary is concentrating on these broad objectives:

1. This time we must get values in return for dollars and goods we supply to the rest of the world; 2. this time we must use our economic policies to bring about the kind of a world in which we can live; 3. this time we must lay down economic foreign policies which will result in genuine help to business and employment at home.

William L. Clayton, the man with the new portfolio, has a big and tough job on his hands but one for which his previous experience—first as one of the largest cotton brokers in the world, and subsequently with the Reconstruction Finance Corp. and then the State Department—appears to give him unusual qualifications. So that he may have all viewpoints, he works with several committees that represent all the interested government agencies — Treasury, State, Commerce, Agriculture, etc., as well as the Army and Navy.

These committees consider an almost unlimited range of subject matter, for most international political considerations are based on economics. Several thousand people are working full time on the various phases of the program. The personnel problem is a difficult one. The State Department now is trying to recruit an additional 250 experienced men to get into foreign service on a career basis. To help out temporarily, a pool of more highly trained government men is being made available to take on special foreign service assignments over the next year or two.

Faces Bank Problem

One of Mr. Clayton's difficult questions at the moment is whether to encourage, as at first favored, raising all the capital of the new International Bank in the United States and put all its dealings on a dollar basis. Now it is feared that such a policy might be very bad for American business in the future; if borrowing nations repay their loans in dollars they will have less dollars to spend for American goods.

Another problem involves preparation for our participation in the Pan-American Conference at Bogota next year. Mr. Clayton naturally wants a program that will promote closest ties with the Latin American countries. Subsidiary to preparing for this conference are such questions as what to do about the purchase programs of the U. S. Commercial Co. and the Commodity Credit Corp.

Another problem is the preparation of economic platforms on which to negotiate trade agreements with some 20 countries. The first step is to determine what product concessions the United States should be prepared to demand and what it should be prepared to give. After the State Department draws up tentative proposals, American importing, exporting, financial and other interests will have a chance to speak their pieces at a series of public hearings. Preparations also are under way to draft "friendship, commerce and navigation" treaties with a number of countries which do not yet qualify for formal trade agreement treaties.

Also among immediate problems one of

AUSTRALIA PAYS: Ambassador Norman J. O. Makin, right, of Australia delivers to Acting Secretary of State Will Clayton a check for $20 million in settlement of Australia's lend-lease account. NEA photo

the most important is that of preparing for a huge meeting next June at which we hope to enroll some 50 countries in the proposed International Trade Organization of the United Nations. Mr. Clayton is busy organizing a delegation to attend a meeting in London in October for the purpose of deciding on the agenda for the meeting of next June.

Customer Again Is Right

Inexorably the process by which one of every four and a half government employees is due to lose his or her job prior to next June 30 is at work—and the wind that is proving ill for some is distinctly good for the many. Life in Washington is beginning to resemble that of prewar days. Good topsoil suddenly dropped from $15 to $5, and now is $3.50 a cubic yard delivered. There again is competition among the cleaners, and suits that took on a boardlike stiffness under wartime dry cleaning again are being rendered soft and inviting by washing. Luscious Smithfield hams from peanut-fed razorback hogs again are available—and at 79 cents a pound. The suburban farm women's market again is featuring homemade sausage and other goodies.

But the change which will be noticed and most welcomed by the many occasional visitors to Washington is a more courteous attitude on the part of waiters, bell boys, et al. About two weeks ago the Howard Johnson restaurants started weeding out nonco-operative help and the movement since has spread widely. The customer again is in the saddle!

Plan Hydrogenation Plant

The Bureau of Mines has placed a contract for equipment for what it believes is the forerunner of a great new industry. Under it the Bechtel Bros. & McCone Co., Los Angeles, will furnish $6,780,000 worth of equipment for a coal hydrogenation plant at Louisiana, Mo., which is to be fitted up to produce 200 barrels of synthetic liquid motor fuel daily. The contract includes heavy forged steel cylindrical reaction chambers, high-pressure heat exchangers and preheaters, high pressure pumps for handling coal-oil "paste," coal pulverizers, apparatus for preparing and cleaning coal and reducing the ash content, and a complete refinery outfit.

Some time in the future, also, the bureau believes, there will be an industry built up on extraction of oil from shale but a lot of development work first must be done to get costs down. The first contract, for two 40-ton retorts for distilling oil from shale, at Laramie, Wyo., has gone to the Southwest Engineering Co., Los Angeles, at around $175,000 which includes an estimate of engineering and installation costs. The final answer also will depend largely on mining costs, and the bureau now is studying the possibilities for getting low costs with different types of equipment at two shale properties near Rifle, Colo. A start will be made with electric shovels supplemented by motor trucks that will load underground right at the mine face.

In working on its synthetic motor fuel and oil shale program the bureau is in continuous contact with an advisory group from the following companies: Gulf Oil Co., Pittsburgh Consolidation Coal Co., Koppers Co., Atlantic Refining Co., M. W. Kellogg Co., Universal Oil Products Co., Hydrocarbon Research Inc., Texas Co., Standard Oil Development Co., Standard Oil Co. of Indiana and Bituminous Coal Research Inc.

MEXICAN UNIONS FETE WALLACE: Secretary of Commerce Henry Wallace, left, is greeted by Lombardo Toledano, organizer of the powerful CTM group of Mexican unions, at a luncheon given in Wallace's honor in Mexico City. In background is U. S. Ambassador Walter Thurston. NEA photo

NPA Studies Labor Relations

National Planning Association officers are hopeful that an approach they are making on the labor-management problem may bear fruit. Sometime ago they decided that the most important single domestic problem in the United States is that involving industrial relations. Realizing that a one-sided approach would be worse than useless, they added a number of trustees with the object of steering the study along factual, nonpartisan lines. Among them are William Green of AFL and Philip Murray of CIO.

Now, by unanimous agreement, the association will launch a study of the labor relations of companies which have enjoyed good labor relations continuously over long periods of years. The object is to determine what factors make "good" labor setups "good."

Ask Contract Criticism

In response to a request issued some two months ago, the Federal Standard Contract Committee has received a dozen or so complaints about dubious and objectionable language in government procurement contracts. Now the request is renewed; the committee wants to complete its work of drafting standard forms

of procurement contracts before the end of the year, and it is eager to hear from contractors who do not like the features of existing contract forms. Communications should be addressed to the committee chairman, Julius Silverstein, Office of the General Counsel, Treasury Department, Washington 25, D. C.

WAA Charged with Faux Pas

A strange oversight of the language sensitivity of the Latin American countries is chargeable against the War Assets Administration. It has printed up huge numbers of Spanish-language circulars for distribution in South America, and has made no allowance apparently for the fact that the official language of the largest country, Brazil, is Portuguese.

The circulars feature surplus machine tools and other production equipment which WAA now is offering for export sale. The circulars will go to some 700 "approved machine tool dealers" who will stamp them with their names and addresses and then send them out over their Latin American mailing lists.

More Patents Listed

Several more companies have listed large blocks of patents at the Patent Office's "Register of Patents Available for Licensing or Sale." These include:

Farnsworth Television & Radio Corp., with 65 electric phonograph and accessory patents; 208 television and radio patents; and 11 electronic communications and signaling patents.

Petrolite Corp., with 408 patents covering various operations in processing petroleum.

The Linde Air Products Co., listing 56 patents including 4 covering removal of deposits from still tubes, 14 covering the Unionmelt welding process, 6 covering a method of building tanks and other multi-plate structures, 1 covering a method for removing metal from metal articles, 1 covering a method of cutting or flame machining, 7 covering a pressure welding process, and 23 relating to heat treatment and equipment therefor.

The Department of the Interior has listed 22 patents for royalty-free license. Included is Patent No. 2,403,481 covering a soda ash process for concentrating iron ore.

WAA Compiles Register To List National Fixed Prices

In a move to insure uniform prices throughout the United States on surplus goods that are sold on a fixed-price basis, the War Assets Administration has compiled a nine-volume price register, to be maintained as a national clearing house of price information on surplus property.

The register represents the first time that all items priced on a national basis have been cataloged in a form that provides a quick reference.

Covering thousands of items, the volumes are broken down into these categories: Automotive and machinery; hardware, plumbing and general products; paper, furnishings, furniture, office machinery and equipment; drugs and medicines; textiles, apparel and footwear; general industrial equipment; materials and supplies; metalworking equipment; and metals.

The register establishes prices according to various levels of trade and sets the minimum and maximum quantities to be disposed of to a buyer.

Foreign Trade Advisory Committees Set up in OIT

Development of an advisory body on trade relations to assist the Department of Commerce was described recently by Arthur Paul, director of the department's Office of International Trade.

Representative foreign traders, manufacturing, export and foreign trade groups will assist the OIT, Mr. Paul said and declared that an Export Advisory Committee, with 37 exporters in it, has already had a preliminary meeting. Another committee representing importers has been formed.

"It is our belief that better understanding between business and government and the development of sound and increased foreign trade can be achieved by co-operation and counselling with businessmen and trade groups through these advisory committees," Mr. Paul said.

Seek Action for Improved Passport, Currency Rules

Concerted business and governmental pressure may result in action by the United States for simplifying passport and visa procedures, customs inspections of luggage, and operation of currency controls.

Sponsored initially by the International Chamber of Commerce, the idea was taken up by the Department of Commerce, and was recommended in a letter from the Secretary of Commerce to the Secretary of State. As a result of this correspondence, the State Department may seek some international accord by the Economic Council of the United Nations.

Additional Steel Items Put Under Export Control

Consolidated licensing procedure extended to cover exportation of all iron and steel products on positive list

NUMEROUS iron and steel products have been added to the positive list of commodities requiring licenses for export by the Office of International Trade, Department of Commerce.

At the same time, the OIT announced that, effective immediately, the consolidated license procedure has been extended to cover the exportation of all iron and steel items on the positive list. Under this procedure applicants submit a single license application quarterly which, if validated, will constitute a consolidated license for the exportation of the licensed commodities to all group K countries.

Consolidated license applications for the fourth quarter of 1946 should be submitted not later than Sept. 23. Applications for subsequent quarters should be submitted on or before the first day of the month preceding the beginning of a new calendar quarter. Application forms and all pertinent instructions and information may be obtained from field offices of the Department of Commerce.

Listed Products Enumerated

The following products have been added to the positive list:

Steel sheet bars, and tin plate bars containing no alloy; concrete reinforcing bars; other steel bars (hot rolled) containing no alloy, one-inch and under only.

Wire rods; skelp, iron and steel; steel sheets, black, ungalvanized, (hot and cold rolled included) containing no alloy; iron sheets, black; iron and steel strip (cold rolled) containing no alloy.

Structural shapes, except fabricated; angles, channels, and beams only, six-inches and under; malleable iron screwed pipe fittings; cast iron pressure pipe fittings; welded black pipe, steel; welded black pipe, wrought iron; welded galvanized pipe, steel; welded galvanized pipe, wrought iron; iron and steel pipe fittings, not elsewhere specified; bale ties, wire, iron and steel; tin foil.

Several nonferrous metals, including copper, lead, brass and zinc in various forms, have also been added to OIT's positive list of products requiring license for export, effective immediately.

Steel Winning Increasing Acceptance

Producers drawing plans and preparing cost estimates to promote metal in more household applications. Actual housing construction—already started—seen as next big step. Structural advantages stressed

ALREADY widely used in solving utility furnishing problems in the home, steel is winning increasing acceptance in many other applications that soon will bring its structural advantages to the householder's castle.

Major steel producing companies are drawing plans and estimating competitive costs to assure this material a permanent seat at the American hearthside.

Inherent strength, dimensions that are the same year in and year out, smooth surfaces, and special steels capable of receiving hard, lasting finishes are some of the advantages being stressed by producers as the reasons why steel is being urged to take off its hat and stay. The next big step in acceptance of steel in homes—and one which is already underway—is actual home construction.

"Steel is firmly entrenched in the kitchen, laundry, bathroom and basement," says Dr. R. E. Zimmerman, vice president, research and technology, United States Steel Corp. "It is winning its way into dining and living rooms, bedrooms and the sun room. It may enclose these areas with strong, tough internal and even external walls, cover them with ceilings, connect them with stairways, warm them with radiant heating pipes, and cool them with air-conditioning ducts."

New Cabinet Being Designed

Among new steel home developments that veer from furnishings toward the structural, still on the drawing board, is an all-steel cabinet designed to cover an entire bedroom wall—or, in new construction, to serve as a wall between two bedrooms, available to both, thus saving 6 to 8 inches of partition space. Fitted with tightly closing doors, this cabinet will contain removable trays for shoes, drawers for personal linen and lingerie, shelves for hats, blankets, pillows and other bedroom articles, and separate closets for clothes. The tight, vermin and dust-proof doors make it possible to set aside one closet for storage of winter clothes, which may be additionally protected by DDT spray.

Another steel cabinet still in the design stage will provide shelves and drawers for household linens. Equipped with sliding doors, it will be practically dust-tight, as well as vermin-proof, and may be connected with a clothes chute. A new all-steel cabinet for sale at a modest price is also being designed especially for canned goods in kitchen or basement.

A complete home unit which has already proved its worth is the prefabricated shower stall, made from porcelain-enameled or stainless steel. Bathtubs, too, are now fabricated from sheet steel and finished in porcelain enamel, thus combining substantial weight saving with the beauty of lasting finish in a variety of colors. Similarly, lavatories, sinks and laundry trays are being pressed from sheet steel and finished in porcelain enamel.

Another new unit being considered for the home is a steel toilet, the bowl, trap and drain pipe of which would be formed from stainless steel, while the supporting shell would be of porcelain-enameled sheet steel in color. This shell would fit against the wall, hiding trap and fittings, and the use of a trip valve would eliminate the awkward flush tank.

A steel unit for the home also likely to win wide acclaim is the prefabricated steel staircase. Introduced before the war, it has been installed in a considerable number of multi-storied dwellings and has the advantage of single-unit construction, is creak-free, fire-resistant and easily installed.

Steel may be especially selected for its specific job, say these technologists. This does not mean a new steel for each new use, but that the most suitable composition may be chosen from the already large list.

This technique can be used to produce unit steel housing sections. Most of the experimental work has been done and successful examples of this type of construction in many cost brackets may be seen in various parts of the country.

The properties of steel make it ideal in home construction, United States Steel officials point out. It is easily fabricated, adaptable to numerous methods of finishing and, finally, it is economical. One of the important considerations is that steel may directly replace several materials performing different functions, steel performing all these functions together.

When this modern practice is followed, according to the experts, steel unit panels offer the following advantages:

1. Ample stud strength is assured by proper design.

2. Good insulation is assured by provision of dead air space.

3. Condensation difficulties are overcome by use of insulation.

4. Steel panels provide a flat, true interior wall, ready for any desired type of finish.

5. Since steel surfaces do not "breathe" the walls remain cleaner and consequently, easier to maintain.

6. Speedy erection and completion.

7. Adaptability to radiant heating.

8. Flexibility of steel unit design results in greater ease and simplicity of construction, storage and movement of material.

No unusual foundation problems are encountered in preparing for modern steel home construction, it is noted. Floor units are fabricated from steel sheets formed into panels which can be bolted directly to the foundation. Over these rigid panels a mastic top coating is applied and wood block flooring or linoleum set in.

Vertical steel panels, designed to provide desired insulation, smooth wall surfaces, and also the strength required to support a second floor or roof, are attached to the floor units. The wall panels are room height, assembled into sections to provide a 4-foot module for easy erection. Other panel groups contain window and door sections.

Outside, these modern steel houses can be of familiar materials, such as brick, stone or wood—or long-lasting porcelain-enamel fused on steel, easily washed and requiring no new coat from year to year, may be used. Windows have steel sections and frames. Their sills usually are made of porcelain-enameled steel.

Home buildings and apartments constructed of steel panels are no idle dream. Many have been erected in various parts of the country. One such building, in River Forest, Ill., has 281 apartments and has proved extremely economical to heat and maintain.

Flat roofs can be of normal roof construction with gravel stops of colored porcelain enamel on steel. Gable roofs may be built of light steel framework or pan construction, covered with porcelain-enameled clapboard-style steel roofing sections. An interesting example of clapboard steel roofing and siding is a housing project near Hammond, Ind., where a number of such houses have been built.

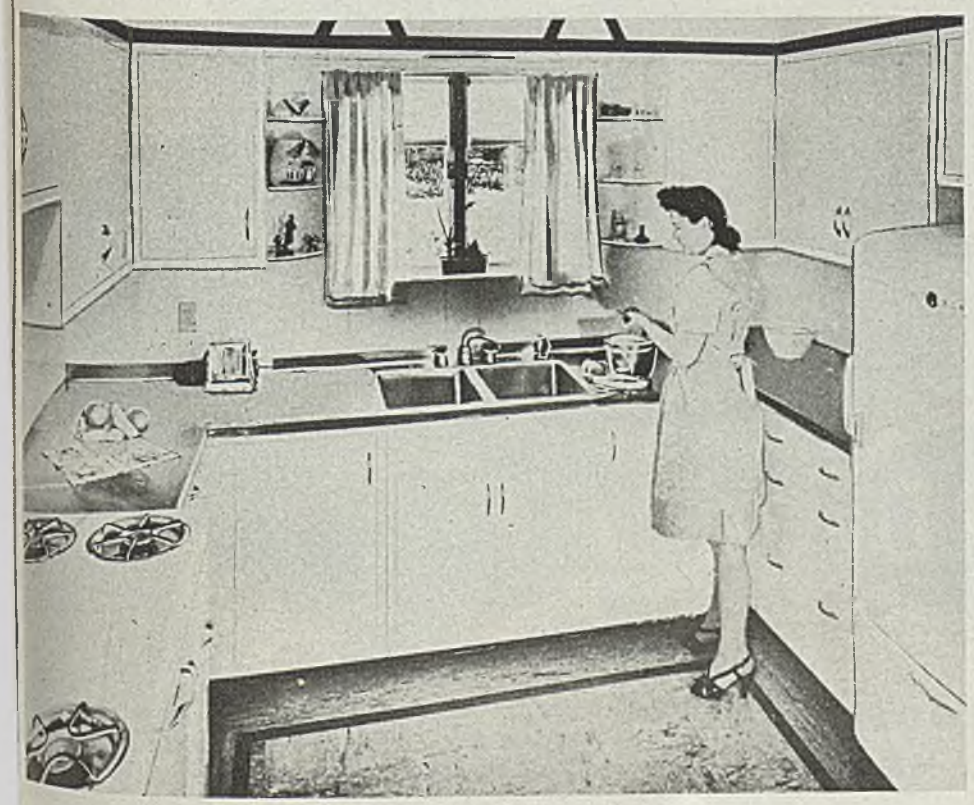
Heating, cooling and air-conditioning equipment may be installed to provide indoor comfort in the steel panel home. Electrostatic dust precipitators, air filters and washers remove dust, pollen, germs and odors from the air.

Radiant heat is in immediate prospect for the American home, and steel walls, floors and ceilings are ideal for this installation. One new system circulates air at 130° above a suspended ceiling, the heated ceiling radiating warmth to persons and objects in the room below. Other new systems use the steel baseboard or cornice panels to circulate the heat.

Steel did not limp its way to the door of the American home nor employ subterfuges to gain admission, steel technologists explain. It arrived in state in the family car.

The automobile was one of the first applications to bring steel's many advantages to the intimate attention of the householder. Research in deep-drawing steels, which made possible the all-steel automobile body, also created steel laundry and bathtubs, sinks and the washing machine, and the extreme flatness of steel sheets, developed to provide a foundation for tough, hard enamel finishes on automobiles, worked equally well for refrigerators, stoves, cabinets, furniture and the like. The present trend merely brings other established structural advantages of steel, long used in bridges, skyscrapers and ships, to the home.

New homemaking ideas developed by steel producers are increasing the quantity of steel used in the home. Shown at right is a modern kitchen, complete with electric refrigerator, stove, toaster, combination sink and cabinets. Entire kitchen unit, including sink and cabinets, is made from steel. At left is a typical porcelain-enamel home with an exterior that is easily washed, requires no paint and lasts for years



Record Industrial Activity Forecast in Eastern Area

Industrial building potential in the eastern states will not be exhausted for perhaps a decade and more business is available now than in any other peacetime period, Wells N. Thompson, vice president, H. K. Ferguson Co., Cleveland, said recently.

"The upward surge in plant engineering and building is indicated by numerous market surveys made by this firm of industrial engineers and builders. Manufacturers' future building programs are taking advantage of the consumer concentration in thickly populated eastern states," Mr. Thompson said. "Some firms are relying on distribution of finished products to offer greater savings with new facilities in this area. Other corporations with widely scattered manufacturing plants are finding it more profitable to construct or enlarge eastern factories than to invest in maintenance construction and long-delayed repairs in buildings elsewhere."

Additional reasons for increased industrial building volume in this section were given as follows: Some industries in the East need either modernization or total replacement to permit them to compete successfully with other manufacturers; and comparatively few new plants were constructed in this area during the war because of security restrictions.

New BULLARD MAN-AU-TROL SPACER

Saves time, money and labor in your Drilling Operation

Designed for installation *by you* on your drills, the new Bullard MAN-AU-TROL Spacer, in most cases, eliminates hole-locating jigs... and the time, money and labor required to design, make, handle, repair and store them.

With unprecedented speed, ease and accuracy, you can set up the Spacer to do the work of jigs that may take weeks or months to make. Once its lateral and longitudinal position stop rods are set for a pattern of holes, the manually controlled, automatically operated Spacer will repeat that pattern indefinitely *to the highest standard of commercial spacing accuracy.* Extreme flexibility permits the use of the Spacer on a large variety of large and small work.

The results: faster, more accurate production . . . lower costs . . . less overhead . . . less human fatigue —all valuable factors in improving your competitive position. Write for MAN-AU-TROL Spacer Bulletin. The Bullard Company, Bridgeport 2, Connecticut.

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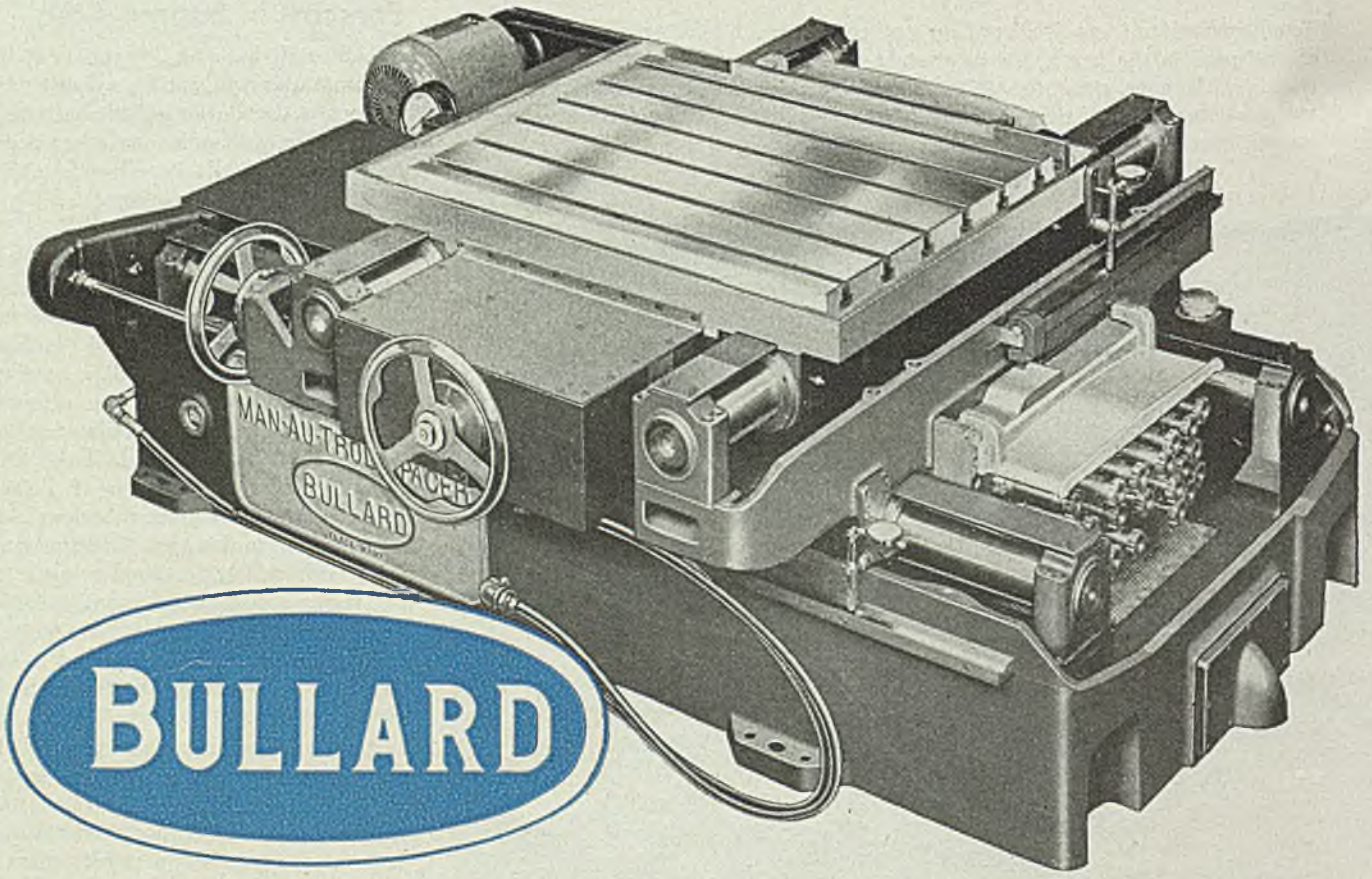
BULLARD ELIMINATES JIGS *for drilling, boring, reaming, tapping!*



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CREATES ***NEW METHODS*** TO MAKE MACHINES DO MORE

Made in 2 sizes — 30" x 20" (illustrated) for larger work on 4', 5' and 6' Radial Drills; and 4" x 4" for work usually done on smaller types of drills.

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

Mirrors of Motordom

Lead shortage may slow auto production. Many companies have only month's supply. Domestic production falls far short of requirements. OPA ceilings restrict flow of scrap metal into legitimate channels. Import policies questioned

DETROIT

IF CERTAIN supply sources do not get the lead out of their plants pretty quick, another crippling shutdown on automobile production is indicated. The motor industry is the most important consumer of lead, using normally about 35 per cent of the total supply for batteries, solder, bearings and terne plate. The trend has been upward, if anything, since the start of the war, since the shortage of tin has meant increasing reliance on lead. As things now stand, automotive buyers are literally scouring the country in search of lead supplies and are coming back empty handed. General Motors indicates it has enough in sight to carry through this month, but October is a question mark. Other companies are in approximately the same position. One of the smaller metals companies here, supplying lead and lead alloys to the automotive trade, reported it was closing last Tuesday because of complete drying up of lead supply.

The story is the old familiar one of governmental regulations, allocations, OPA price recontrol, weird import policies, etc. The entire situation has been outlined by the automotive industry to John Steelman of the OWMR, and it is hoped that emergency steps can be taken to relieve the immediate difficulties. With the employment of around 500,000 threatened, it is almost inconceivable such action will not be forthcoming.

Demand Far Outstrips Output

Roundup of the salient facts shows this: Total U. S. demand for lead on a restricted consumption basis is about 80,000 tons a month. Domestic output of mines this year has averaged 25,000 to 30,000 tons per month, and under present conditions no more is to be expected from these mines, which operate under a labor shortage of 25 per cent and under a subsidy program which appears to be contrived so as to place a premium on the working of high-cost low-yield mines and a penalty on operation of high-yield veins. Of the total domestic production, 25 per cent must be shipped to the Metals Reserve Corp. for allocation, the balance sold through conventional channels.

During the lapse of the OPA the price of lead rose from 8.25 cents a pound, the ceiling, to 9.50 cents and immediately the movement of both concentrates and lead scrap was importantly stimulated. Until that time, little scrap was appearing on the market, the supposition being that it was being channeled principally to plumbers through the black market at a considerable price premium. Normally, scrap can be counted on for about 25,000 tons per month. With the restoration of OPA price controls, the lead price was "rolled" back to 8.25 cents in the interests of "holding down the cost of living," and immediately the flow of scrap stopped and refineries which had purchased concentrates on the basis of the higher price began to wonder how they could possibly make out with the price of metal pushed back to its former level.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

Tabulated by Ward's Automotive Reports

	1946	1941
January	121,861	524,037
February	83,841	509,332
March	140,777	533,878
April	248,318	489,856
May	247,620	545,321
June	214,511°	646,278
July	330,764°	468,897
August	364,046°	164,793
Estimates for week ended:		
Aug. 24	91,360	45,525
Aug. 31	74,960	39,965
Sept. 7	76,106	32,940
Sept. 14	95,000	53,165

°Preliminary

Since it appears obvious domestic requirements for lead cannot be met from domestic production, imports must be depended upon to make up the balance. For some strange reason, a "deal" is reported to have been made by the government with Great Britain to restrict U. S. imports from that country this year to a maximum of 7500 tons a month, drastically lower than last year. Beyond this, Metals Reserve is buying in world markets at a price over the domestic ceiling, but probably not up to the effective world market which is around 10 cents a pound. Government purchases abroad are understood to be based upon informal agreements and understandings with foreign nations, and no explanation of these agreements affecting foreign distribution has been made.

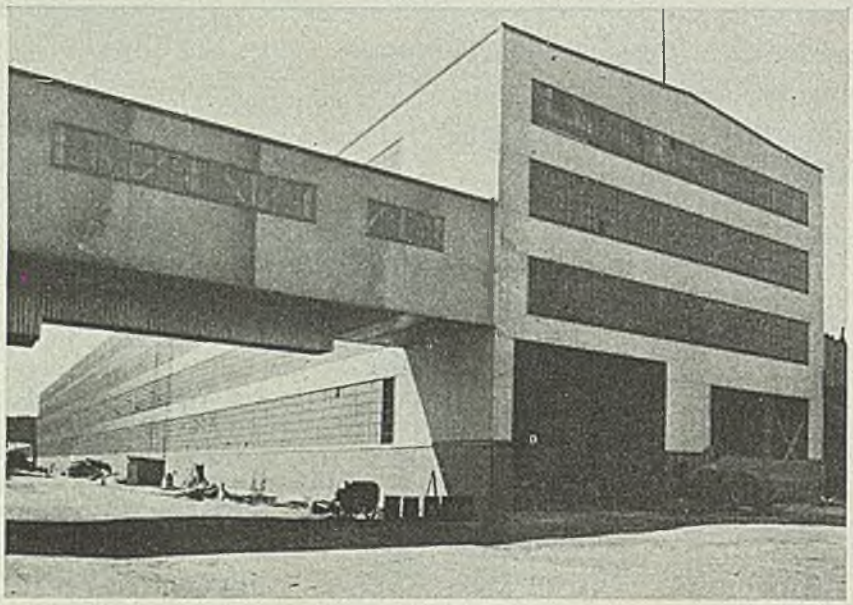
The automotive industry, in its appeal to Mr. Steelman, does not attempt to recommend a course of action, nor to judge whether the enforced withholding of lead supplies from the market by smelters because of the price rollback is legitimate or proper. All it seeks to do is to state its "in the middle" position which endangers the jobs of half a million and which may further delay the shipment of new cars to long-frustrated buyers.

Discussing the lead shortage, C. E. Wilson, president of General Motors, said recently that discussions had been held over the advisability of shipping new cars minus batteries, leaving it up to the buyer to find a new or used one somewhere. Thus far, such a policy has been ruled out for the reason that various GM divisions consistently have refused to ship anything but complete cars, with a few minor exceptions.

Employees Demand Cars

As the production pace on new passenger cars mounts, one more difficulty being encountered by builders is the strident demand for cars from employees who watch their handiwork being driven out to haulaway lots while they get only blank stares from dealers with whom they try to place orders. The situation became so critical at Nash in Milwaukee the other day that body plant employees quit work allegedly in protest against new cars being earmarked for export while they could buy none. The situation was adjusted by the management agreeing to allocate 17 cars a week for delivery to employees, with the proviso, however, that the assembly rate would be maintained at 500 per day or better. This figure is about what Nash has been producing over the past few months when sufficient materials were available.

Another manufacturer, faced earlier with the same problem, agreed to allocate a certain number of cars each day for employees, and to increase this number when hourly assemblies ran above a certain point. To make an equitable distribution of these cars to employees—sold at a discount of 20 per cent, incidentally—an elaborate point system was worked out whereby each employee wishing to buy a car could determine



NEW BUICK BUILDING: First major project in Buick's postwar expansion and modernization program to be completed is this manufacturing and subassembly building at Flint, Mich. It has 252,000 sq ft of floor space. Construcion of a dozen other buildings at Flint will add another 1,000,000 sq ft of floor space for Buick operations

his rating on the basis of senicrity, age of his present car and the need for it, length of service with the company, etc. Those with the highest point ratings, of course, were allocated the first cars, each recipient signing an agreement that he would not dispcse of the vehicle inside of one year.

OPA Sues Steel Brokers

Claiming the Detroit surplus steel black market the worst he had found in five states of the district, a regional OPA steel price specialist has brought treble damage suits totaling mcre than $319,000 against four concerns here. The suits, so the specialist declares, involve surplus steel bought from the War Assets Administration for as low as $16 a ton and resold for as much as $120 a ton, passing through several brckers on the way up. Also under investigation by the OPA were several cases where steel was purchased by veterans using their high priority and acting as "finders" for brokers. The disc'csures tend to confirm comment published here several months ago on the matter of "special deals" on steel being offered buyers by brokers never before in the business.

Tucker Has Difficulties

The Tucker Torpedo is having its troubles in getting going in Chicago, primarily due to difficulties over financial arrangements on leasing the $180 million Dodge-Chicago manufacturing plant. Under the most recent arrangement, Tucker was to pay $600,000 the first year, $800,000 the second year and $2.4 million yearly thereafter. This has appeared a little stiff to Tucker and his backers, who reported'y thus far have paid only a $10,000 option fee, and they have requested easier payments since it will take about a year to make any semblance of production in the plant. The WAA, however, has balked at the new prcposals and has made a counter-offer with a deadline of Sept. 18. The current unsettlement in securities markets conceivably could put the kibosh on the whole deal.

Break-Even Point Up

Considerable discussion is heard these days of the so-called break-even point in motor car manufacturing—in other words, at what level of production do cperations move into the profit area. Hitherto it has been considered sound business to have the break-even point somewhere between one-third and one-half of capacity, because it has not been possible to operate at capacity for 12 months of the year, or for year after year. Present conditions throw this line of reasoning considerably out of gear, with the result that General Motors, for example, is operating at something over half of prewar capacity yet is still some distance from showing any substantial operating profit. Another smaller company, now cperating at around 80 per cent of the prewar peak, does not expect to show any profit until November and then only if assemblies are moved ahead to still higher ground.

One reason, of ccurse, is the postwar disorganization of production incident to reconversion. Another is the reduced productivity of working people. General Motors says the best measure it can make indicates a productivity of around 80 per cent now compared with 1941—not too bad but still not good. A third reason is overloaded supervisory forces in most plants which early this year were being geared for production well beyond any yet achieved. A fourth reason is the high proportion of nonproductive labor in unit costs, something all automotive plants are now trying to trim. It is no easy task when you consider the amount of expediting necessary to keep materials flowing, along with 40-50 per cent increases in cost of clerical help, supplies and nearly everything else not going directly into the motor vehicle itself.

Labor turnover and absenteeism are two other phases of the production picture which throw the normal routine into a tangle and add to unit costs. Absenteeism for the Tuesday following Labor Day in the five passenger car manufacturing divisions cf GM, for instance, was approximately 10 per cent, about double the average for this year, and four times the rate prior to the war.

Add all the above factors together and stack them against price relief granted on passenger cars by OPA and to GM it spells out the need fcr another $100 increase in prices. Such an adjustment currently is being sought and if granted probably would be the signal for other manufacturers to ask similar upward moves in prices.

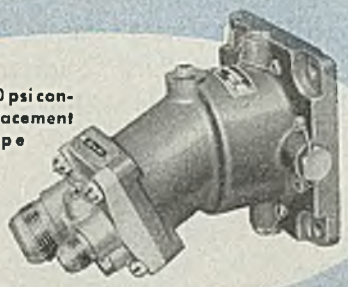
Buick Assemblies Gain

One of the brightest performers in the GM troupe at the moment is Buick, where assemblies have been moving up steadily and are now past the 5000 weekly mark. August output was 20,098, 36 per cent ahead of July, and marked the attainment of the 1000-car daily volume for the first time since prewar. Total output for the year through August was 64,765, cr the equivalent of about two months' production in 1941.

Ford Limits Styles

Report is curre:t in automotive circles that Benson Ford, younger brother of Henry Ford II, is being groomed for the presidency of the Lincoln-Mercury Division, now established as a separate entity from the Ford organization. Meanwhile Ford has announced the discontinuance of production of five body styles in the interests of concentrating on the half-dozen or so remaining types.

VICKERS Hydraulic Pumps AND CONTROLS



Vickers 3000 psi constant displacement Piston Type Pump

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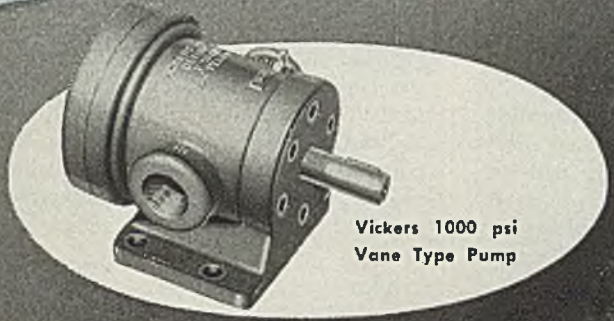
Reliability with minimum weight . . . greater safety and longer life . . . are among the exacting requirements of the airlines. It is significant to designers and users of many other types of equipment that Vickers Hydraulic Pumps and Controls are widely used in the 3000 psi hydraulic systems of these huge planes that are literally writing new pages in aviation history.



Vickers 1000 psi Vane Type Pump

Huge cutting machines depend upon Vickers Hydraulic Pumps and Controls to speed the work and reduce the cost of mining coal. The operator controls the massive machine more easily than you drive your car.

Between these extremes, Vickers Hydraulic Equipment is serving industry in countless ways . . . wherever accurate, dependable and easy control is needed. In addition to the thousands of more widely known applications on metal working machinery, Vickers Hydraulic Pumps and Controls are used on construction equipment, motor buses, printing presses, agricultural machinery, marine equipment, oil well pumping units, textile and paper machinery, trucks, etc. Vickers Application Engineers will be glad to discuss with you how hydraulics can be used to your advantage.

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Allotments for New Plant and Equipment Rise

Industry plans to spend $3.2 billion during third quarter of 1946, compared with $2.9 billion in second quarter

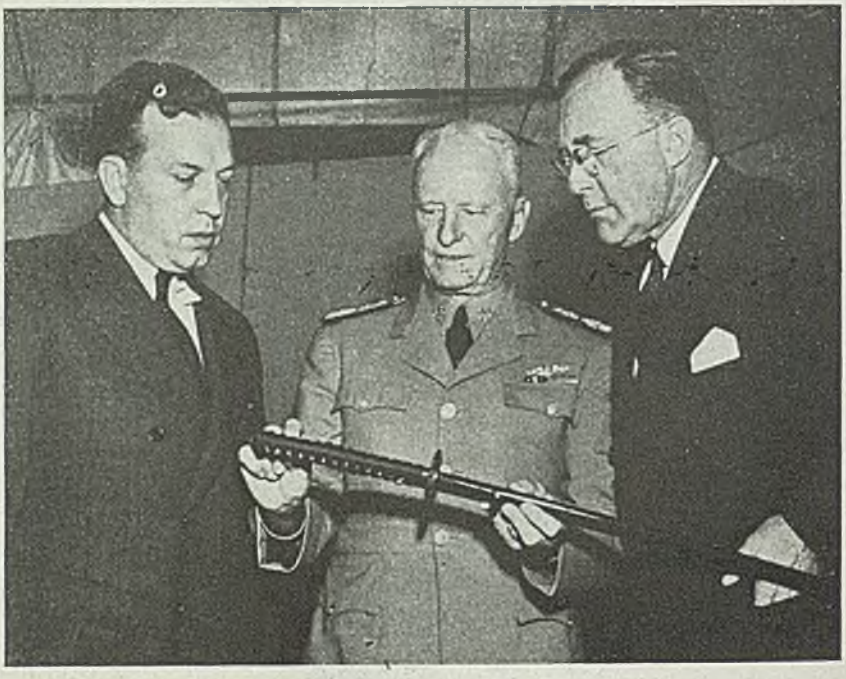
EXPENDITURE of $3.2 billion for new plant and equipment in the third quarter of 1946 is planned by American business, exclusive of agriculture, the Securities & Exchange Commission and the Department of Commerce reported.

A joint quarterly survey, based on reports submitted by corporations and manufacturing companies, said that there has been a steady increase in expenditures for new plant and equipment since the beginning of 1945. Estimated outlays in the third quarter of 1946 are almost twice those in the corresponding quarter of 1945. Planned expenditures for the second quarter of 1946 were $2.9 billion. Actual expenditures during the first quarter of 1946 totaled $2.2 billion.

"If the anticipated expenditures on new plant and equipment for the third quarter of 1946 actually eventuate," the report continued, "they would be at an annual rate 50 per cent higher than the peak year 1941. Taking into account the substantial increases in prices since 1941, resulting expenditures would still be somewhat higher than 1941."

During the first quarter of 1946, industry as a whole spent 10 per cent less than had been planned, chiefly because a few very large manufacturing concerns were unable to obtain requisite materials or met labor difficulties.

"Planned expenditures on new plant and equipment by manufacturing and mining companies in the third quarter of 1946," the report said, "are estimated at $1.8 billion, 55 per cent of the total amount for all industry. Of this sum, manufacturing alone accounts for $1.7 billion, of which about 70 per cent was planned for the purchase of equipment."



SOUVENIR: Fleet Admiral Chester W. Nimitz, ranking naval hero of World War II, shows samurai sword, sent him by a former Japanese admiral, to R. S. Peare, left, General Electric Co. vice president, and C. E. Wilson, right, GE president. Admiral Nimitz took part in a special V-J Day commemoration telecast over WRGB, GE's television station at Schenectady

New Bethlehem Facilities To Start Operating in 1947

Operation of part of the facilities included in the $20 million program at Bethlehem Steel Co.'s Lackawanna, N. Y., plant is expected early in 1947, Edward F. Entwisle, general manager of the Lackawanna plant, has announced.

The program, which was announced in September, 1945, includes a fourth slab heating furnace for hot strip, additional finishing equipment for hot-rolled sheets and modernization of existing equipment.

"Improvements are also being made to facilities for finishing cold-rolled sheets, including an extension of the coil storage building and modern conveyors for handling the large tonnage of materials involved," Mr. Entwisle said.

"Extension of both of the continuous pickling units to increase their capacity, the addition of a fourth stand to one of the two continuous cold reducing mills and the addition of a new cutting-up line particularly adapted to cutting lighter gage sheets are also part of the current construction," Mr. Entwisle added.

BRIEFS . . .

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

Crucible Steel Co. of America, New York, has moved its New York branch sales office and warehouse from 537 Broom St., to 650-652 East 12th St., New York 9.

—o—

Crescent Corp., Fall River, Mass., has acquired Potter & Johnston Machine Co., Pawtucket, R. I., manufacturer of automatic turret lathes.

—o—

East Shore Machine Products Co., Cleveland, has acquired the tool and surface plate business of State Mfg. & Construction Co., Franklin, O.

—o—

Monsanto Chemical Co., St. Louis, has purchased for $9,550,000 from War Assets Administration the Texas City, Tex., styrene plant which Monsanto built and operated during the war. The company is planning to expand its polystyrene plastic production to a rate of more than 80 million pounds by early 1947.

—o—

National Radiator Co., Johnstown, Pa., has announced a course in "Heating Salesmanship" which has been prepared by LaSalle Extension University, Chicago.

—o—

Luria Steel & Trading Corp., New York, has opened a district office in the Syndicate building, St. Louis.

—o—

Rheem Mfg. Co., New York, has formed an association with Hume Pipe Far East Ltd. to operate a steel shipping container plant at Singapore, Malay

Peninsula, for the petroleum, latex and palm oil industries. The new company, Rheem-Hume Ltd., is capitalized at $400,000.

—o—

Elliott Co., Jeannette, Pa., has received a contract for a locomotive gas turbine from Locomotive Development Committee, Bituminous Coal Research Inc., Washington. The turbine, to be rated at 3750 hp at the turbine coupling, will burn pulverized coal.

—o—

Sterling Engine Co., Buffalo, has received a $1,500,000 order for Viking diesel engines and parts to power diesel-electric locomotives produced by Whitcomb Locomotive Co., Rochelle, Ill.

—o—

REF Mfg. Co., Mineola, Long Island, N. Y., has developed a rustproof, corrosion-resistant sink bowl for all types of boats. The bowl is made of solid, 18-gage Monel metal.

—o—

Watson-Standard Co., Pittsburgh, has announced a new series of protective coatings as a substitute for white base and finish coatings.

—o—

Food Machinery Corp., San Jose, Calif., has purchased Bolens Products Co., Port Washington, Wis., manufacturer of garden tractors.

U. S. Steel Corp. Properties In West To Be Inspected

Properties of the United States Steel Corp. in Utah and California will be inspected this month by a party of directors of the corporation.

The inspection will start in Utah on Sept. 19 and will end in Los Angeles a week later. The party also will make first-hand observation of postwar industrial progress in the western states.

Regular meetings of the finance committee and board of directors of U. S. Steel will be held at the San Francisco office of Columbia Steel Co. on Sept. 24.

Intava Inc. Signs $5 Million Army Air Forces Contract

The United States Army Air Forces has signed a contract with Intava Inc., New York, for servicing AAF planes in 43 countries throughout Europe, Africa, and South America. The contract permits withdrawal of military forces at many of the airports in these countries.

Supply of aviation fuel and lubricating oil will be controlled by one contract, which is the largest of its kind ever entered into by the AAF. This contract obligates procurement funds in excess of $5 million and permits large stocks of AAF fuel and oil available in military installations to be handled and issued on a service fee basis.

$3 Million Modernization Begun at J. I. Case Plant

J. I. Case Co., Racine, Wis., has begun a $3 million modernization and expansion program at its tractor and farm implement plants in Rock Island, Ill. Several old buildings will be replaced by a $1,500,000 one-story factory building. A new office building, modernization of machine tool equipment, a 6000-square foot addition to the foundry, improvements to the casting units and a new snap flash unit are contemplated. The Rock Island works now has a capacity of 80 tractors a day.

New Steel Warehouse Firm Organized at Los Angeles

Opening of a steel warehouse in Los Angeles was announced last week by Robert Zurbach, formerly with the L. E. Zurbach Co., Somerville, Mass. Following disclosure that his firm was specializing in sheets and flat rolled strip, Mr. Zurbach reported that his initial stock of some 60 tons was "sold out within two days."

The company plans to install shears and round edging machines with the acquisition of permanent quarters. Temporary warehouse and plant offices are at 2619 S. Santa Fe Ave., Los Angeles.

Bundy Tubing Co. Relocates General Offices

Detroit industry moves six administrative departments to new headquarters recently purchased and remodeled

BUNDY Tubing Co., Detroit, has moved six administrative departments to new general offices on East Jefferson Avenue, that city.

Purchased and remodeled at a cost exceeding $100,000, the new offices supplant facilities on Hern Avenue and were acquired as part of a general expansion program which includes a research laboratory now nearing completion at Coolidge Highway and Maple Road. The new offices provide 15,000 square feet of floor space to accommodate approximately 100 employees in the company's executive, purchasing, sales, advertising, comptroller's and general accounting departments.

Moving of the offices was prompted by a desire to obtain a location easily accessible to the downtown area and by difficulties encountered in procuring new building materials.

Bundy's main plant on Nine Mile Road is producing up to 50 million feet of tubing a month.

DELIVER FIRST EARTH MOVER: First "Gradall", multi-purpose earth mover produced by the Warner & Swasey Co., Cleveland machine tool builder, is delivered to Thomas Conte, partner in the Construction Equipment & Supply Co., Pittsburgh. Delivering the keys to Mr. Conte, in driver's seat, is Charles J. Stilwell, Warner & Swasey president

Production at West Coast Mills Threatened by Scrap Shortage

Lack of supply attributed to the drop in shipbuilding and to curtailment of steel shipments from eastern mills to West Coast fabricators. Shipbreaking not expected to provide enough scrap for current needs

SAN FRANCISCO

SOME West Coast steel mills which have been operating at or near capacity soon may have to curtail production because of dwindling supplies of scrap.

Flow of scrap to mills has been declining steadily for a number of months and stockpiles now are the lowest in recent years. Some mills have less than a week's supply on hand.

In normal times before the war, the West Coast was never a surplus scrap area. Normally, furnace charges are in the proportion of 85 to 90 per cent scrap and 10 to 15 per cent pig iron. (It is understood this ratio in some mills recently has been increased to about 30 per cent to 35 per cent pig). During the war, because shipyards produced large amounts of scrap, West Coast mills had enough for all needs and surplus was built up for allocation to other areas. Large amounts of this surplus scrap were shipped eastward by the government. However, when shipbuilding operations were halted, this major source of supply was cut off, and scrap supply problems have been mounting ever since.

Another factor has been the curtailment of steel shipments to the coast by eastern mills. Fabricators have had to curtail operations because of the shortage of many steel items, and this has had the effect of reducing the supply of trimmings which previously went back into coast furnaces.

It is believed some scrap is being held back by speculators, but there is no estimate of the amount involved. In any case, the other two factors are more important.

Some relief to the scrap scarcity may come from break-up of surplus vessels, although that source is not likely to be large enough to offset all of the shortage. Moreover, shipbreaking is only getting started now and is quite likely to move slowly.

One company in the San Francisco Bay area has just started breaking up ten surplus vessels purchased from the Maritime Commission last spring. These ten vessels are expected to produce 20,000 to 30,000 tons of No. 1 heavy melting grade scrap, which will be shipped to mills at the rate of 2000 to 3000 tons a month. This is the first breaking operation of any size on the West Coast. It is expected to be followed by more when more vessels can be obtained.

A large amount of scrap is being put up for disposal by the government in Hawaii, but under terms of movement, it is not likely that enough transport space can be arranged to attract buyers.

Steel mills on the West Coast consume about 1,600,000 tons of purchased scrap annually in addition to the material which comes from their own operations. California mills alone require some 1,300,000 tons. Approximately 1 million tons of the coast consumption is in open hearths, and 365,000 tons are needed in steel foundries. Gray iron foundries require some 235,000 tons a year.

One factor which may affect the scrap supply further will become apparent more clearly soon. Workers in scrap yards in the San Francisco area have just been granted a wage increase of 12½ cents an hour and time and a half for Saturday work. As labor is about 75 per cent of the operating expense of a scrap

SEAMEN PICKET: Nationwide maritime strike gets under way on San Francisco's Embarcadero. Here several AFL Sailors Union of the Pacific pickets, in foreground, patrol outside the Matson Navigation Co. piers. CIO longshoremen, in background, refuse to cross picket line. NEA photo

yard, the result is an increase of about 15 per cent in overall yard costs.

Meantime, the shortage of finished steel items grows more severe than ever in the San Francisco area. Although Geneva Steel is approaching full operations and expects to turn out more than 50,000 tons of plates in September, the lack of rolling mills to produce lighter items is the big bottleneck. The greatest steel shortages are in sheets and other light products.

An informal survey of several Bay area fabricators shows that steel is the number one scarcity, with shortages of copper, brass and bronze products, and electric motors and wire running close second. In the construction industries, nails still are scarce, as are a number of other steel building items.

One manufacturer of furnaces, fans, water heaters and similar items says that the shortage of light gage steel sheet is limiting his production severely. This company could triple output if it could obtain all the steel and motors it now requires.

Another firm is hard put for gray iron castings, galvanized sheets and copper pipe fittings. A maker of building hardware has cut operations sharply because of the shortage of cold-rolled sheets, strip brass and bronze. Punching steel and brass is most troubling bottleneck for a fourth fabricator, although it also is experiencing a shortage of machine tools.

At the Geneva plant in Utah, number of employees now is above the 2000 mark, which compares with employment of 2400 at the time the mill was placed on a stand-by basis a year-ago.

At present Geneva operations are being hampered somewhat by lack of manpower at the coal mine and a shortage of rail cars to transport coal to the coking ovens.

California Aircraft and Parts Plants Add Workers

Three major aircraft and parts manufacturers in southern California are adding employees or increasing backlogs toward a steady expansion of the entire industry, it was reported in Los Angeles last week.

North American Aviation is upping its production force by 3000 persons, it was stated. The payroll last July 1 stood at about 6000. Backlog orders of the concern have increased from $75 million on June 1 to $90 million this month. Consolidated Vultee also announces expansion although no specific figures are available.

Menasco Mfg. Co., has received contracts for additional gas turbine and jet engine production totaling $2,402,700.

Industrial Expansion Slowed in Los Angeles Area by High Costs

Economic growth of area threatened, says spokesman for district industry. Points to high wage costs in relation to other manufacturing districts of nation. Some eastern manufacturers revising West Coast plans

WITH wages in metal trades industries in the Los Angeles area the highest in the nation and with work slowdown programs gaining momentum, economic expansion in this area faces a fight for survival, according to Eltinge P. Brown, general manager, Metal Trades Manufacturers Association of Southern California.

"Already," Mr. Brown told a STEEL reporter last week, "certain eastern plants which started with expansion programs during and since the war have had to alter their original plans, confining operations to assembly rather than production activities.

"Sane American labor leadership, like sane employer leadership, wants good wages, decent working conditions, homes, family life, churches, schools and pleasures.

"But both labor and management know there is no security in a job if the job is threatened with collapse. Such collapse will surely come to our Pacific Coast states unless the present labor costs are quickly reduced to an equitable basis."

Wages Boosted by 57.5 Per Cent

Quoting a survey made by the MTMA, which is being sent to some 400 industrialists throughout the western states, Mr. Brown said that while living costs have advanced 39.4 per cent since January, 1941, (Bureau of Labor Statistics figures), the average wage boost in Los Angeles' machine shops, foundries and fabricated steel works has been 57.5 per cent since the same base date.

Comparing wages in various sections of the nation, the survey report states:

"The metal trades industries on the Pacific Coast pay 74.5 per cent of workers between $1 and $2 per hour; only 24.5 per cent are receiving less than $1 an hour. The next highest area in the country—the Great Lakes states—shows only 47 per cent of workers receiving $1 to $2, and 51.1 per cent being paid less than $1 an hour.

"Other competitive areas, i.e., the Middle Atlantic and New England states, show 39.4 per cent and 41.4 per cent, respectively, as being from $1 to $2 an hour, with 57.6 and 58 per cent receiving less than $1. Thus the Pacific Coast is 27.1 per cent higher than the average of the country in the number of workers receiving $1 to $2 an hour, and 26.3 per cent below the U. S. average for the number working for less than $1 an hour."

Mr. Brown said: "If we are to be realistic we must move immediately toward the goal of reducing our labor costs and increasing our present low rate of productivity. On the latter point there is no proof that West Coast production workers sincerely desire to increase current rates of output.

"Let us examine fairly the cost-of-living picture, on which wage demands are based. Some union leaders have questioned the federal figures of 39.4 per cent increase in living costs since 1941. These have set the actual rise at from 80 to as high as 112 per cent. But so far as the compilers of this report are aware, proof of such rises has never been made. Until better methods are devised and put into execution the current official figures are the only fair computations useful for reference.

"It is time to forget the arguments that because milk goes up 5 cents a quart or bread increases 2 cents a loaf or 12 cents a pound that wage rates must be increased 15 to 18½ cents an hour.

"The fact remains—average earnings in the metal trades of Los Angeles are 18.1 per cent higher than the increase in cost of living since January, 1941. Our wage rates are 11 to 57 per cent higher than elsewhere in this country.

"We are now entering a highly competitive industrial period. Our success depends upon how we meet the competition of local, national and foreign producers. The southwestern states, for example, with labor costs less than eastern, Middle Atlantic or Great Lakes states, may be expected to pour finished products into the West Coast markets at prices much lower than the coast itself can afford to sell them. This merchandise will be no better than ours, yet the cost of producing it will be much lower.

"We will bewail this condition—and organized labor will join with management in condemning this 'foreign' competition—but the show will go on inevitably, and many of our local producers may disappear from the industrial scene forever."

Men of Industry

HENRY J. WALLACE

JOHN W. BAER

J. J. FRIEDLER JR.

Henry J. Wallace has been appointed general manager of sales, National Tube Co., Pittsburgh, subsidiary of United States Steel Corp., New York. He succeeds **W. F. McConnor,** who recently was elected National Tube vice president in charge of sales. Mr. Wallace joined the company in 1928 as a laborer at the Ellwood City, Pa., plant. He took a company training course at the Lorain, O., plant in 1929, and then was a field engineer in the Pittsburgh Sales Division until 1933. Following this, he served in a sales capacity at Indianapolis and Pittsburgh until 1937, at which time he was made manager of sales of the Pittsburgh office. In 1942, he was appointed assistant general manager of sales in charge of ordnance. Since 1945, Mr. Wallace has been sales manager of the company's eastern area with offices in New York. **Arthur Landis** has been appointed superintendent of the company's Christy Park Works, McKeesport, Pa. The plant had suspended operations soon after V-J Day, and is reopening on a restricted basis limited to specialized production of high pressure cylinders. Before joining National Tube, Mr. Landis was vice president in charge of operations of the Orange, Va., factory Snead & Co., Jersey City, N. J.

—o—

August K. Paeschke, grandson of one of the co-founders of Geuder, Paeschke & Frey Co., Milwaukee, has been elected president of the firm, succeeding **Henry F. Millmann** who has been named chairman. **Curt E. Hoerig** and **Lloyd R. Mueller** have been named to vice presidencies. Mr. Paeschke, who served in the Army for 3½ years, joined the company in 1936, and had been a vice president since April, 1945. He is the third generation of his family to head the concern. Mr. Millmann has been with the firm for 56 of its 58 years, and had held the presidency since April, 1945. Mr. Hoerig had been assistant works manager of the company, and Mr. Mueller, division sales manager.

—o—

Ernest S. Theiss has been appointed assistant chief engineer, Davey Compressor Co., Kent, O. For the last 7 years Mr. Theiss was assistant professor, mechanical engineering department, Duke University, Durham, N. C. He was formerly secretary of Region 4, American Society of Mechanical Engineers. He is a member of National Society of Professional Engineers, American Society of Heating & Ventilating Engineers, and Society for the Promotion of Engineering Education.

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Horace D'Angelo, secretary and treasurer, Harry Ferguson Inc., Dearborn, Mich., has been appointed executive vice president of the company.

—o—

John W. Baer, recently released from the Army, has been appointed chief engineer for the Forker Corp., Cleveland. Before entering the service, Mr. Baer served as tool engineer and chief draftsman for the corporation.

—o—

Gail Rutledge has been appointed midwestern regional sales manager, General Detroit Corp., Detroit. He will be located in the corporation's Chicago branch office, and will supervise sales in the states of Illinois, Wisconsin, Minnesota, and South Dakota. Mr. Rutledge joined the firm in 1944, and had recently been assistant to the vice president and coordinator of national accounts and branch operations. **Harold J. O'Neill** has been named to succeed Mr. Rutledge as assistant to the vice president and coordinator of national accounts. Mr. O'Neill joined the corporation in 1942, as manager of the CD-Sno Fog Division, General's carbon dioxide extinguisher plant. Later he became field manager, working out of the midwestern office in Detroit. He then became Central States zone sales manager for Michigan, Ohio, Wisconsin and Kentucky.

—o—

J. J. Friedler Jr., southern district manager, Ilg Electric Ventilating Co., Chicago, has been elected to the board of directors of the company. Mr. Friedler has been associated with the New Orleans office of the Ilg company for more than 20 years. He entered that office as a salesman, and in 1928 was named New Orleans branch manager. More territory was placed under his supervision, and in 1930 he was appointed southern district manager. **G. C. Jelliffe,** recently released from the Navy, has been appointed direct assistant in the New York office to **P. D. Briggs,** vice president and general manager of the company. **Keith P. Ribble** has been placed in charge of the Houston, Tex., office of the firm, under Mr. Friedler's direction. Mr. Ribble had been with Allis-Chalmers Mfg. Co., Milwaukee. During the war he served with the War Production Board. **E. B. Bomar** has been placed in charge of the Phoenix, Ariz., office of the Ilg company. He was a sales engineer in that area for several years.

—o—

William J. Digges has been appointed field assistant in the New York and New Jersey regional office, United States Department of Labor. He will act as information officer for the Wage and Hour and Public Contracts Divisions, Office of the

The Rocky Mountain Rocket of the Rock Island Lines.

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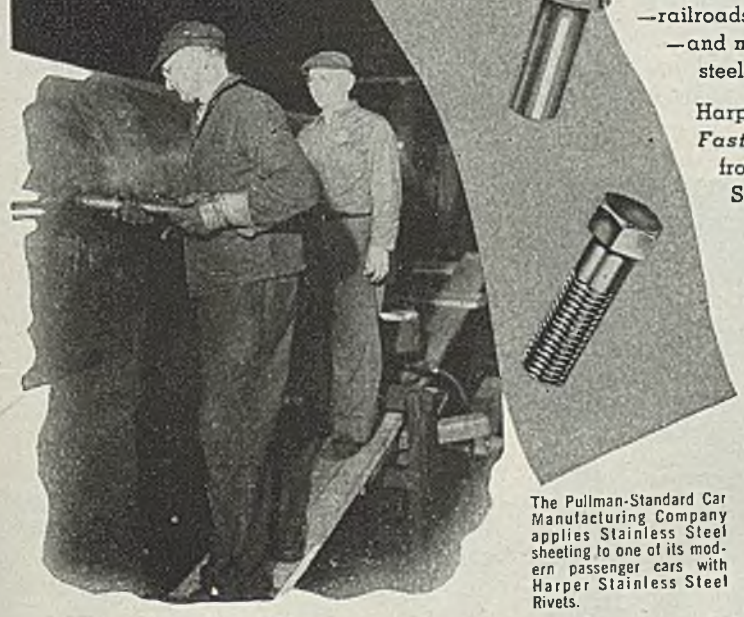

The Pullman-Standard Car Manufacturing Company applies Stainless Steel sheeting to one of its modern passenger cars with Harper Stainless Steel Rivets.

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BRASS • BRONZE • COPPER • MONEL • STAINLESS

Solicitor, Conciliation Service, Bureau of Labor Statistics, U. S. Employment Service and Women's Bureau of the Department of Labor in the region. Mr. Digges had been information director of the New York Regional War Labor Board from 1943 until its termination last December. Subsequently he was assistant to the chairman of the regional Wage Stabilization Board, and assistant director of public information of the National WSB in Washington.

—o—

Quentin D. Mehrkam has joined the staff of Ajax Electric Co. Inc., Philadelphia, a division of Ajax Metal Co. of that city. Mr. Mehrkam will be engaged in developing new processes and experimentally heat treating manufacturers' specimen work in the company's research laboratory. He had been a production metallurgist with Thompson Products Inc., Cleveland.

—o—

Sam Wolff has been placed in charge of the new St. Louis district office, Luria Steel & Trading Corp., New York. He had been with Standard Steel & Rail Co. Inc., St. Louis. **J. R. Snelson** will be associated with Mr. Wolff in Luria Steel's St. Louis office. Mr. Snelson had been with the purchasing department of Granite City Steel Co., Granite City, Ill.

—o—

Howard J. Ward has been appointed district manager for the Michigan territory, Udylite Corp., Detroit, succeeding **William H. Ross** who recently resigned. Mr. Ward has been with the company for the last 10 years, and during the war spent most of his time in Washington working on plating problems with Army and Navy engineers.

—o—

David F. Kahn, former president of Estate Stove Co., Hamilton, O., and **Dr. Boris Emmet**, former national retail merchandising manager of Sears Roebuck & Co., Chicago, have been named directors of Noma Electric Corp., New York. Dr. Emmet will be special merchandising adviser to the company's president, **Henri Sadacca**. Other directors named were **Leo L. Pollak** and **Carl Schlesinger**, former president and vice president, respectively, of Pollak Mfg. Co., Arlington, N. J., which has just been merged into Noma.

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D. Frazer Sullivan has been elected a member of the board of Graham-Paige Motors Corp., Detroit.

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Edwin Gebauer has joined the engineering department of Pollak Steel Co., Cincinnati.

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C. B. Ball has been appointed branch manager in Birmingham for Le Roi Co., Milwaukee.

—o—

W. R. Elwell has been appointed to the newly created position of merchandising department buyer, Snap-On Tools Corp., Kenosha, Wis. He had been sales engineer with the company.

—o—

Thomas E. Brown has been appointed assistant superintendent of the Bacchus, Utah, plant, Hercules Powder Co., Wilmington, Del. Mr. Brown joined the company in April, 1939, and had been dynamite supervisor at the Hercules, Calif., plant since July, 1944.

—o—

J. C. Leonard has been appointed sales manager, Industrial Marketing Division, Oakite Products Inc., New York. He will direct the marketing and servicing activities of Oakite's industrial field staff. Mr. Leonard has been with the company for more than 22 years, and for the last 16 of these had been manager of the Chicago Division.

—o—

William M. North has been promoted from assistant secretary to secretary, National Gypsum Co., Buffalo, succeeding the late **Frank E. Davis**. **Bernard L. Wootten** has been elected assistant secretary of the company, and **Ray Lund** has been named assistant treasurer. Both were with National Gypsum prior to their appointments.

—o—

Warren C. Olson has been promoted to secretary and comptroller general, Charles H. Besly & Co., Chicago, succeeding **Henry N. Wade** who served as secretary of the Besly organization for 50 years prior to his death last month. Mr. Olson has been in Beloit, Wis., with the Besly company since 1942.

—o—

H. Bruce Wilson has been appointed manager of industrial relations, Pittsburgh Limestone Corp., Pittsburgh, subsidiary of United States Steel Corp., New York. **Henry R. Baltzersen** has been named comptroller and assistant secretary of the Limestone corporation, and **Raymond W. Long**, assistant comptroller. Mr. Wilson joined the company in 1922, and became assistant to supervisor of industrial relations in the company's general offices in Pittsburgh in 1935. He has been secretary and auditor of the company since 1940. Mr. Wilson is a member of Controllers Institute of America, and National Association of Cost Accountants. Mr. Baltzersen was assistant auditor for the company since November, 1943. He joined United States Steel Corp. of Delaware as senior auditor in March, 1943. He is a member of National Association of Cost Accountants. Mr. Long has been eastern district bureau chief of the Audit Division of Carnegie-Illinois Steel Corp., Pittsburgh, since April, 1945.

—o—

Keith Hopkins, supervisor of the car-order section of the traffic department, Caterpillar Tractor Co., Peoria, Illinois, has been named assistant traffic manager of the company. He has been with the company since 1936. In his new position, Mr. Hopkins will share the duties of assistant traffic manager with **Roy J. Rhodes**, who has served in this capacity for several years. Mr. Rhodes will devote his attention to rate matters, while Mr. Hopkins will handle all duties other than those concerned with rates.

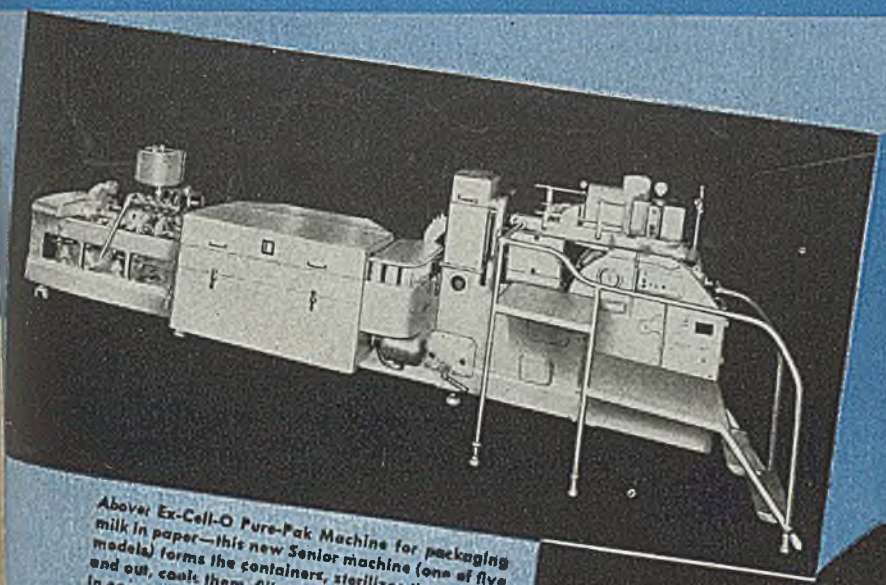
—o—

John W. Cavanaugh, a Chicago attorney and a partner in the law firm of McDermott, Will & Emery, has been elected a member of the board of directors of Ekco Products Co., Chicago. He is also a director of Whiting Corp., Harvey, Ill., and South Bend Lathe Works, South Bend, Ind. He will fill a vacancy on Ekco's board, created when the membership was increased from five to six last

HOWARD J. WARD

J. C. LEONARD

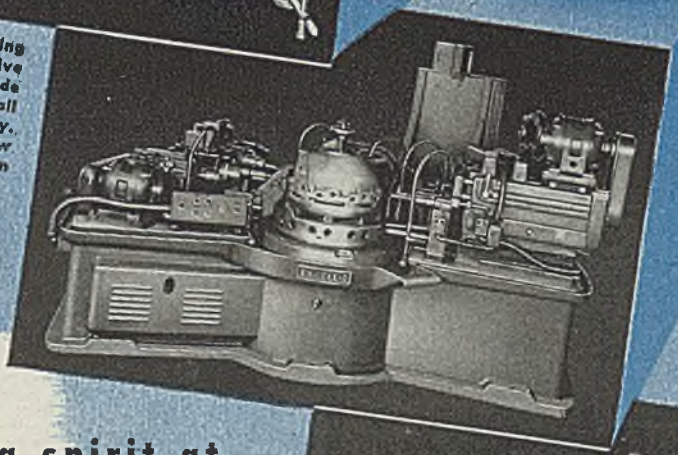
DIVERSIFIED ? *Yes...*



XLO

EX-CELL-O *for* PRECISION

Above: Ex-Cell-O Pure-Pak Machine for packaging milk in paper—this new Senior machine (one of five models) forms the containers, sterilizes them inside and out, cools them, fills, seals and dates them—all in one continuous, automatic operation in the dairy. Pure-Pak containers for dairy products are now being used at the rate of more than one billion containers a year.

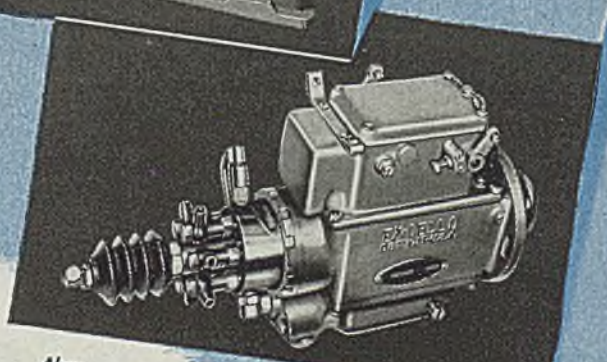


To Right: Ex-Cell-O engineering services and precision machines are being used by many American industries for the mass production of accurately-made parts and sub-assemblies. Shown is Ex-Cell-O special machine for broaching and reaming 18 holes and drilling 36 holes in a magnesium crankcase.

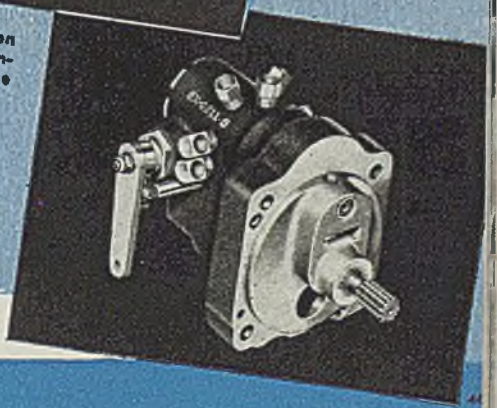
. . . the pioneering spirit at Ex-Cell-O remains undaunted!

. . . an opportunity to reaffirm our company's allegiance to the pioneering spirit that brought it into existence. It is a spirit that maintained Ex-Cell-O unfailingly during the economic extremes of the twenties and the thirties, and that enabled the company, during the early forties, to make a worthwhile contribution to our nation's war effort. I can say in all sincerity that the same spirit impels the whole Ex-Cell-O organization of today . . . a clear assurance of the active role that Ex-Cell-O will play in the peacetime years immediately ahead.*

**from a message by Phil Huber, President and General Manager of Ex-Cell-O Corporation, on the occasion of the company's 25th Anniversary . . . as timely and significant now as when given in 1944.*



Above: Ex-Cell-O Fuel Injection Pumps—for high speed DIESEL engines in the automotive, marine and industrial fields.



To Right: Ex-Cell-O GASOLINE Injection System for aircraft engines —the advantages of gasoline injection make flying safer, easier, and more economical and enjoyable.

EX-CELL-O

CORPORATION • DETROIT

Manufacturers of Pure-Pak Paper Milk Bottle Machines, Aircraft and Miscellaneous Production Parts, Precision Machine Tools and Equipment, Continental Cutting Tools, Fuel Injection Equipment, Railroad Detail, and Drill Jig Bushings.

July by amendment of the corporation's by-laws. **Ronald Goodman**, recently released from the Army, has been named to the newly created post of publicity manager for Ekco Products Co. He will co-ordinate all publicity activities for Ekco's seven plants in the United States, two subsidiaries in England, and Ekco Products Co. (Canada) Ltd.

—o—

George W. Putnam has been appointed district manager of the Central District, Republic Steel Corp., Cleveland, succeeding **C. W. Meyers** who has resigned to become president of Colorado Fuel & Iron Corp., Denver. **Walter M. Farnsworth**, divisional superintendent, and **E. R. Johnson**, district chief metallurgist, have been named assistant district managers of Republic's Central District. Mr. Putnam joined Republic as open hearth superintendent of the Youngstown District in 1933. In 1937 he was made assistant district manager of the Warren District, and 2 years later assistant district manager of the Central District, which position he held at the time of his new appointment. Prior to his association with Republic Steel, Mr. Putnam had been with American Rolling Mill Co., Middletown, O. Mr. Farnsworth, in addition to being assistant district manager of the Central District, will be assistant district manager of the Chicago District and will have charge of the electric furnace operation in both districts. He joined Republic's predecessor company in 1925, and has served as superintendent of the No. 1 electric furnace melt shop, as divisional superintendent in charge of the Canton Steel Division, and divisional superintendent in charge of the Canton Steel Division blast furnace and coke plant. Mr. Johnson joined Central Steel Co. in 1925, and had been chief metallurgical engineer since 1944.

—o—

L. A. Hester has been appointed manager of the Transportation Division, Middle Atlantic district, Westinghouse Electric Corp., Pittsburgh. He will have headquarters in Philadelphia. **R. F. Moon**, who formerly held the post, has been appointed special representative. Mr. Hester joined Westinghouse in 1923, and served in various capacities with the transportation branch before his present appointment. Mr. Moon has been with the Transportation Sales Division at Philadelphia during most of his Westinghouse employ.

—o—

Stuart D. Distelhorst, recently released from the Army, has returned to his position as sales promotion manager with Cochrane Corp., Philadelphia. During Mr. Distelhorst's absence of almost 4 years, his department was under the direction of **Joseph S. Oldknow**, personnel manager of the company. Mr. Oldknow continues with layout and production of advertising and other printed matter, in addition to his personnel management work.

—o—

Albert G. Black, economist and former professor at the University of Minnesota, Minneapolis, has been appointed special assistant in the Department of Commerce to handle northeastern state regional problems. He will work with federal and state agencies in his new post.

—o—

P. M. Dinkins, associated with American Cyanamid Co., New York, since 1923, has been made president of Jefferson Chemical Co. Inc. Jefferson was organized in 1914 by Cyanamid and The Texas Co. to produce chemicals from petroleum and petroleum gases.

—o—

C. H. Hedenberg has been named operations manager of Goodrich Svenska Gummi, Aktiebolag, Stockholm, Sweden, subsidiary of International B. F. Goodrich Co. Mr. Hedenberg has had 12 years' experience in the rubber industry in Sweden.

—o—

Harry A. Trishman has been appointed manager, Hydraulic Division, Erie Foundry Co., Erie, Pa. For 20 years he had been chief engineer with Adamson United Co., Akron, subsidiary of United Engineering & Foundry Co., Pittsburgh.

—o—

Thomas P. Archer, vice president of General Motors Corp., Detroit, who has been general manager of the Fisher Body Division, has been named group executive in charge of a new group of divisions which will include Fisher Body Division, Ternstedt, and Buick-Olds-Pontiac Assembly Division. **L. C. Goad**, vice president, who has been in charge of Buick-Olds-Pontiac Assembly Division, and of the Dayton and Household Appliance Divisions, becomes general manager of the Fisher Body Division, including Ternstedt. **B. D. Kunkle**, vice president, will be in charge of the Dayton and Household Appliance Divisions. **C. B. Stiffler**, who has been Mr. Goad's assistant, will be assistant to Mr. Kunkle.

R. E. THOMAS
Who has been appointed purchasing agent, Dumore Co., Racine, Wisc., noted in STEEL, Aug. 26 issue, p. 70.

—o—

William J. Wade has been appointed head of the distribution planning group of Willys-Overland Motors Inc., Toledo, O. Prior to 1937 he worked as an experimental engineer for Surface Combustion Corp., and for De Vilbiss Co., both in Toledo, O. From 1937 until 1941, he was with Spicer Mfg. Corp., Toledo, as a designer. Mr. Wade was recently released from the Army.

—o—

J. G. Ripstra and **Richard J. Skillman** have been appointed to the field sales staff, Banox Division, Calgon Inc., Pittsburgh. Mr. Ripstra will work out of the company's Detroit office, covering Detroit, Grand Rapids, Mich., Chicago, Milwaukee and other cities in that area. Mr. Skillman, working out of the Philadelphia office, will cover the eastern seaboard. Mr. Ripstra was with Hayes Mfg. Corp., Grand Rapids, holding the posts of chief chemist, process engineer and finish engineer. Mr. Skillman was released from the Navy in March. Prior to naval service, he was a sales engineer with General Refractories Co., Philadelphia.

—o—

Don M. Compton, formerly chairman, Foote Bros. Gear & Machine Corp., Chicago, has been appointed chief of the Chicago Ordnance District, succeeding Col. Joel G. Holmes who is being transferred to Joliet, Ill., as field director of ammunition. During the war, Mr. Compton served the ordnance department as deputy director of the safety and security division in the office of the chief of ordnance, Washington. Col. Holmes, during his 10-month tenure as chief of the Chicago Ordnance District, completed major termination activities. His new duties will be to direct ammunition programs in the country.

—o—

Dr. Simon Freed, former assistant chemistry professor at the University of Chicago, has been appointed chief chemist at the Monsanto Clinton Laboratories, Oak Ridge, Tenn. The laboratories are operated by Monsanto Chemical Co., St. Louis, under contract with the Manhattan District, as a research center in connection with the Oak Ridge atomic en-

CLARENCE H. COLLIER JR.

Appointed manager, Industrial Lift Truck Eastern Division, Hyster Co., Portland, Oreg., noted in STEEL, Sept. 9 issue, p. 110.

KENNETH F. THOMAS

District engineer, New England office, Kaydon Engineering Corp., Muskegon, Mich., noted in STEEL, Sept. 2 issue, p. 90.

J. HUBERT CUNI

Personnel director, Lodge & Shipley Machine Tool Co., Cincinnati, noted in STEEL, Sept. 9 issue, p. 110.

ergy development program. Dr. Freed has been invited by the Physical Society of the Netherlands and the government of the Netherlands to take part in the International Conference on Physics, commemorating the fifteenth anniversary of the discovery of the Zeeman Effect in atomic spectra.

—o—

Carl I. Schweizer, chief metallurgist, Steel Improvement & Forge Co., Cleveland, has been named to head the company's newly established Turbine Forgings Division. The division will specialize in parts of high temperature alloys required for gas turbines and turbosuperchargers. Mr. Schweizer has devoted the major part of his time the last 3 years to working out methods for forging the newest alloys. Until 1940, he had been with American Steel & Wire Co., Cleveland, subsidiary of United States Steel Corp. **Arthur Zimmerman** has been appointed sales manager of Steel Improvement & Forge Co. He was with Weatherhead Co., Cleveland.

—o—

Freeman H. Dyke, assistant general manager, located in Steubenville, O., of Wheeling Steel Corp., Wheeling, W. Va., will preside over sessions of 10,000 steel mill executives when the Iron and Steel Exposition opens in Public Hall, Cleveland, Oct. 1. The Association of Iron & Steel Engineers will hold its annual convention in conjunction with the exposition.

—o—

Carl W. Meyers, long prominent in the steel industry, has been elected president of the Colorado Fuel & Iron Corp., Denver, succeeding E. Perry Holder, resigned. Mr. Meyers resigned as manager of the Central District, Republic Steel Corp., to accept his new post, effective Sept. 10. He became associated with the Upper Works of Carnegie Steel Co. at Youngstown in 1907, beginning as a roll hand in the bar mill. In 1918 he was transferred to the McDonald Works of the company where he stayed until 1931, the last eight years as superintendent. In that year he joined Republic Steel Corp. as superintendent of the rolling mill in Chicago, and two years later was named roll engineer for the corporation. In 1934 he was transferred to Canton, O., as assistant manager of Republic's Central District, and in 1937 was appointed manager of the district, the post he resigned to go with Colorado Fuel & Iron Corp. He will maintain offices at 500 Fifth Ave., New York, and also in Denver.

OBITUARIES....

Arvid C. Ericson, 55, former assistant to the president of Jack & Heintz Precision Industries Inc., Cleveland, died in that city, Sept. 7. He was in charge of die casting production at Jack & Heintz before he retired 10 months ago.

—o—

John Clifford Cotter, 64, sales manager for 22 years, Merrill Bros., Brooklyn, N. Y., died recently.

—o—

Frank G. Hanny, 48, personnel manager, Aurora Pump Co., Aurora, Ill., died in that city, Sept. 3.

—o—

Nathan Paley, 73, president, Paley Brothers Co., Madison, Wis., died recently in that city.

—o—

Frank Martin, 63, Philadelphia representative of Spencer Turbine Co., Hartford, Conn., died in Philadelphia, Sept. 3. He had been with the New York office of the company for 9 years before joining the Philadelphia office in 1932.

—o—

John J. Wharam, 52, chief passenger car engineer, Ford Motor Co., Dearborn, Mich., died in that city, Sept. 5. He joined Ford in 1921 and worked continuously in various engineering capacities.

—o—

Henry L. Robinson, 64, sales manager, Laramie Machine Works, Cicero, Ill., died in Maywood, Ill., Sept. 7.

—o—

William E. Sharp, 68, traffic manager, Niagara Falls Smelting & Refining Corp., Buffalo, died in Kenmore, N. Y., Sept. 2.

—o—

Thomas A. Laux, 62, assistant to the general manager of sales, Fabricated Steel Construction Division, Bethlehem Steel Co., Bethlehem, Pa., died at his home in that city, Sept. 6. He joined Pennsylvania Steel Co. in 1909, and that company became a part of the Bethlehem Steel organization in 1916.

—o—

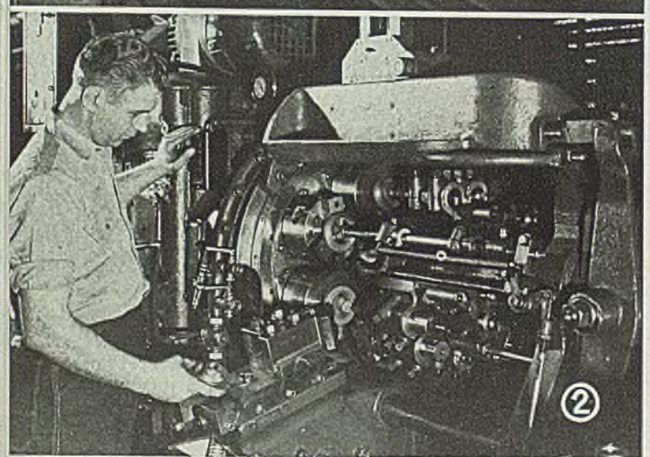
William H. Vannatta, 60, assistant comptroller, Bethlehem Steel Corp., Bethlehem, Pa., died at his home in that city, Sept. 3. He joined the company in 1918, and had been assistant comptroller since 1943.

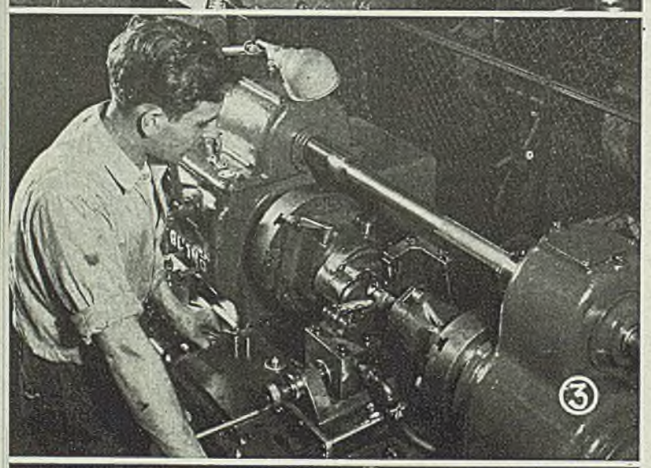
—o—

Fred Otto Volz, 49, vice president and sales engineer, Lakeside Bridge & Steel Co., Milwaukee, died Sept. 6. In years of service, he was the oldest employee of the Lakeside company. He was a member of American Welding Society.

—o—

G. Howard Estey, 73, president and co-founder of Estey Bros. Co., Brooklyn, died recently at his home in that city. With his brother, S. Raymond Estey, he founded the company in 1904.





Machining Compressor Crankshafts

Special machining setups are used in Servel plant to finish crankshafts accurately to tolerances and quantities required

By G. ELDRIDGE STEDMAN

USUALLY thought of as a manufacturer of gas refrigeration, air conditioning and automatic water heating equipment, Servel Inc. of Evansville, Ind., is also one of the largest producers of reciprocating type compressors—a component of electric refrigeration—in the country. These factory-sealed supermetic motor-compressor assemblies, encased in a steel shell, are mounted with condenser, receiver, fan motor and accessories on a rigid steel base, completely connected and ready to install.

Models in production are in the fractional horsepower range for such uses as farm and home freezers, store fixtures, milk, beverage, room and water coolers, industrial cooling and vehicle refrigeration.

Each unit has force feed lubrication on every bearing, wrist pin and piston. Suction and discharge are muffled to unusual perfection in noise and vibration removal, precisions under 0.0001-in. and to a 5 microinch finish.

Main parts of the factory-sealed compressor, other than the motor units, are produced within the Servel plant. Control of such volatile and fugitive gases as F-12 (Freon) demands precision of unusually close tolerances. The most modern landing and honing techniques are involved.

In 1939 the company decided to market this line of supermetic commercial condensing units and an investigation was started to determine types of machine tools necessary to produce the volume and quality desired. Continuing until the end of the war, this investigation included precision gaging methods which would assure attaining and maintaining the accuracy and finishes involved in the production.

To detail all of the production, gaging and inspection operations involved in the manufacture of the compressor would entail use of a great amount of space. It is thought that the nineteen production steps necessary to produce the compressor crankshaft of the accuracy and finish required will present a fairly good picture of the machine tool equipment involved, and the characteristics of the company's high speed production routing.

The crankshaft forgings (*Please turn to Page* 118)

Fig. 1—Forged crankshafts about to be stress relieved at a temperature of 900° F

Fig. 2—Bearing plates, shown here, crankshafts and pistons are produced on Baird 6-spindle semiautomatic chucking machine

Fig. 3—Specially built LeBlond indexing lathe for machining pin bearings

Fig. 4—Deep hole drilling machine for drilling oil passage hole to depth of 6 15/32-in., four shafts at a time. Machine is timed so drills clear automatically before chip loading can cause drill breakage

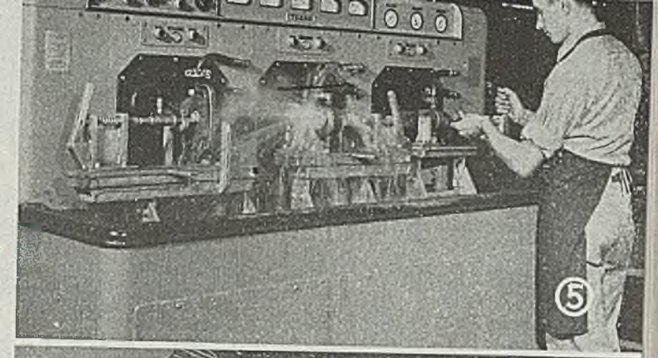
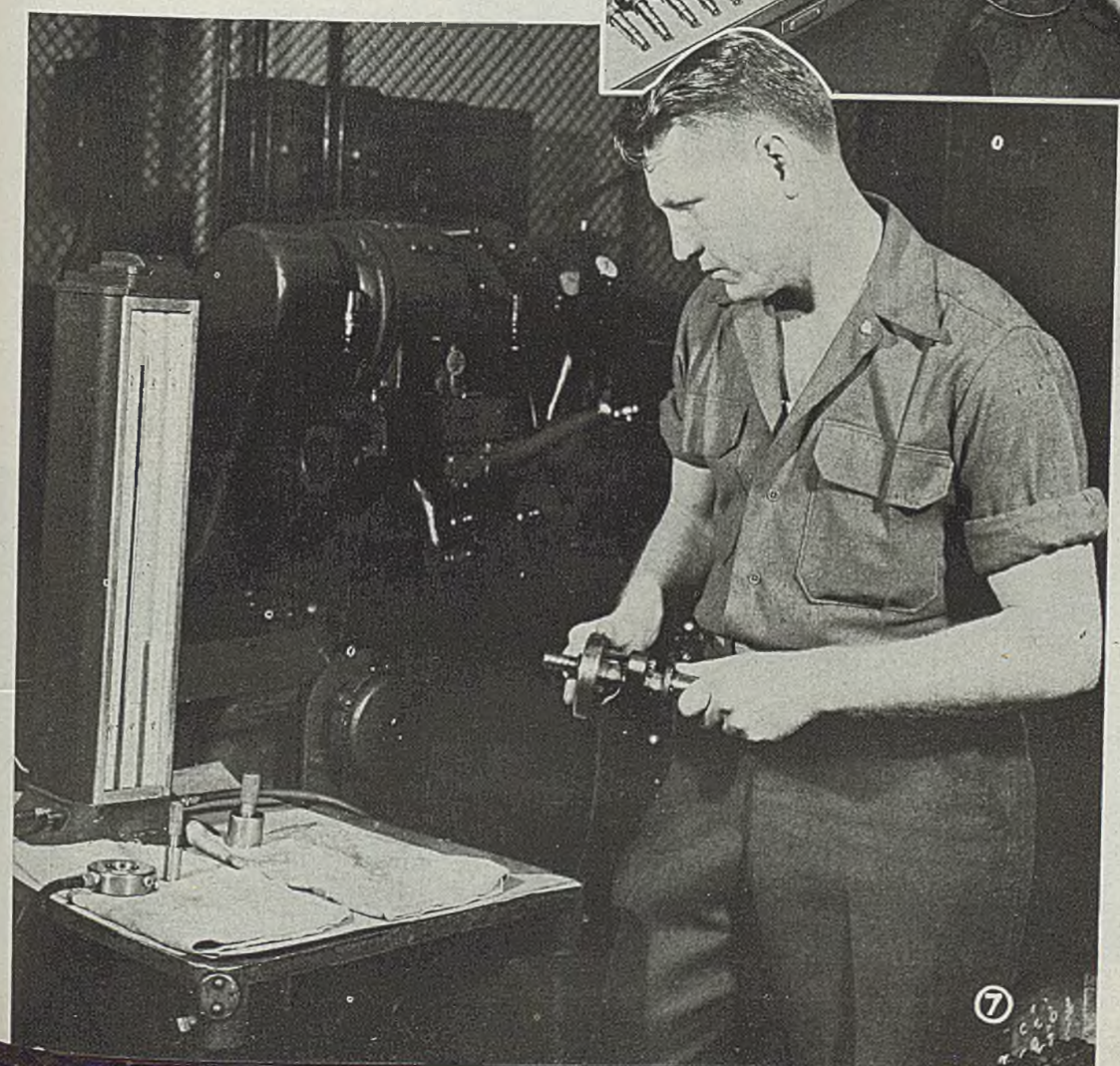


Fig. 5—Induction hardening of all bearings on shaft to a C scale rockwell hardness of 60 to 62

Fig. 6—Finished crankshaft being thoroughly checked on all dimensions with gaging equipment as shown

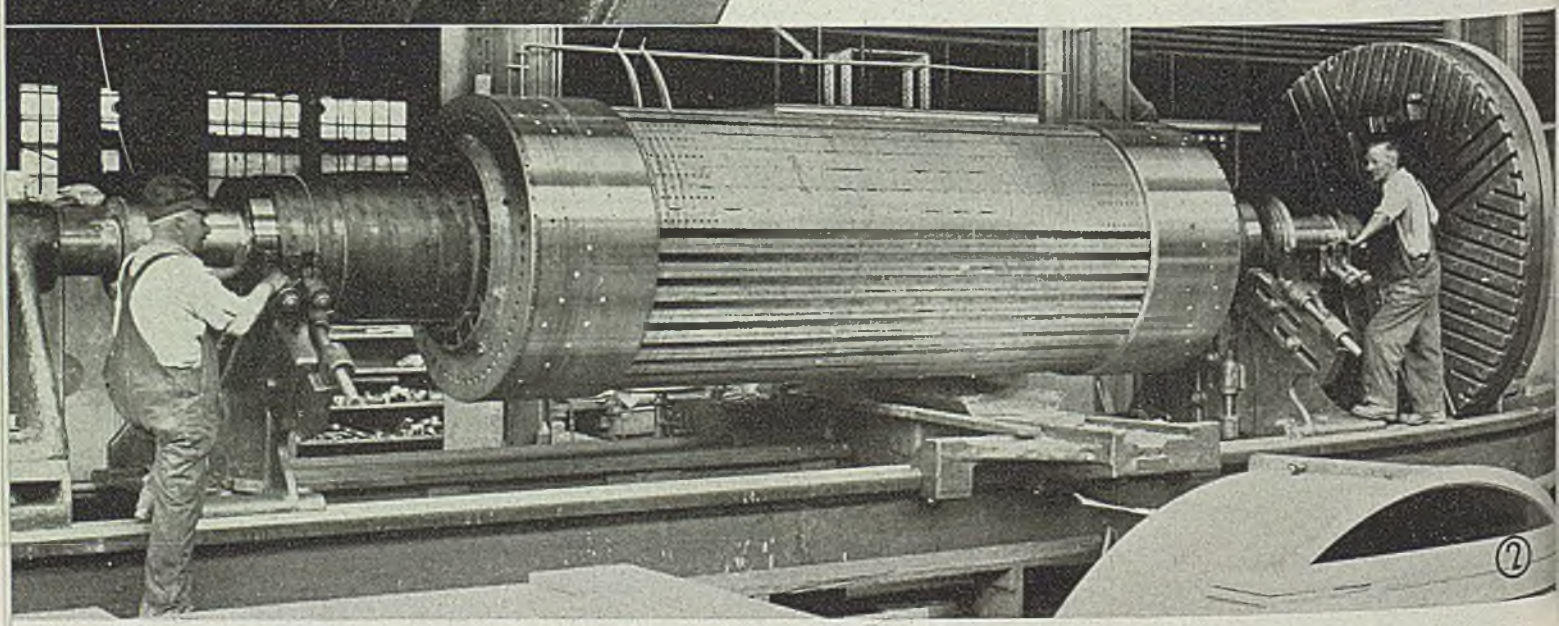
Fig. 7—Checking grinding tolerances with air gages graduated to 0.00005-in. Bearings are round to a tolerance of 0.0005-in.



Testing Cylindrical Forgings

By J. E. PETERMANN
Mechanical Engineer
Electrical Department
Allis-Chalmers Mfg. Co.
Milwaukee

Method of strengthening the rotor coil retainer rings for turbo-generators by plastic deformation evolves as part of static tests which subject thin-walled chromium-nickel alloy to stresses approaching yield strength



OVERSPEED testing of rotating parts frequently presents many problems. To overcome these a method has been devised by W. B. Cart, mechanical engineer at the Allis Chalmers Mfg. Co. for static testing thin walled cylindrical forgings which are subjected to stresses approaching the yield strength of the material.

The test consists of subjecting the cylinder to a high internal pressure, which stresses the forged ring beyond the yield strength. A two-fold purpose is accomplished by this test: (1) The forging, if not up to par, will show signs of failure such as surface cracks on either the bore or outside surface; also a poor stress strain curve will result; (2) by cold working the ring, the yield point of the material is increased. While raising the yield point of ductile materials by cold working is a relatively common practice, this method of strengthening of rotor coil retaining rings on turbo-generators by plastic deformation is unique.

Due to the fact most present day turbo-generators are operated at either 1800 or 3600 rpm, the rotating field or rotor operates under very high stresses. Among the highest stressed parts of a rotor of this type is the rings which keep the ends of the coil (which extend beyond the rotor body) from flying radially outward. Approximately two-thirds of the stress on a typical high speed ring actually is caused by its own weight. For electrical reasons it has been found a real advantage in most cases to make these rings of a nonmagnetic steel. Therefore, an austenitic chrome-nickel alloy was selected.

Typical physical requirements of these rings are:

Tensile strength	120,000 psi.
Yield Strength	100,000 psi.
Elongation	20 per cent
Reduction in Area	30 per cent

Forging this material to give the properties required is very difficult and requires extremely close control in production. If the forging temperature is too high, the proper physicals cannot be obtained and if it is too low the forging will crack and will probably be so hard that machining will be out of the question. This gives us another good reason for the pressure test as a check on the forging, because if the parts described here should fail in service it would mean that damage would be done amounting to many thousands of dollars.

The first step in testing a cylindrical forging is to take a test coupon from each end of the cylinder. The coupons are then made into test bars in the materials test laboratory and the standard pull test is performed. If the results of these tests are satisfactory, further tests on the rough forging proceed. An example of typical satisfactory test bar results might read as follows:

Tensile Strength	137,500 psi and 145,250 psi
Yield Strength (.1% set)	106,750 psi and 102,250 psi
Proof Stress	97,750 psi and 93,750 psi
Elongation	33 and 23.5 per cent
Reduction in area	28 and 26 per cent

Difficulty may result, however, from basing conclusions on the physical properties of the test bars alone, since the bars are taken from the ends of the forging and do not necessarily give a true picture of the forging as a whole. Therefore, the next test is performed on the entire forging in its rough machined state.

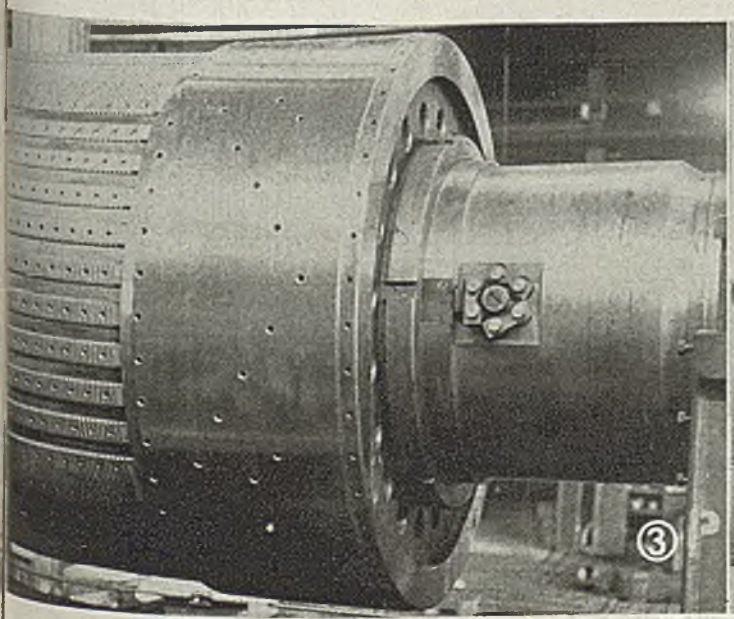
The test set up is shown in Fig. 6. The entire equipment takes little space and is light enough to be moved about in the shop quite easily. Item 1 is the cylinder to be tested. Item 2 is the internal heavy cylinder which is part of the testing. The space between item 1 and 2

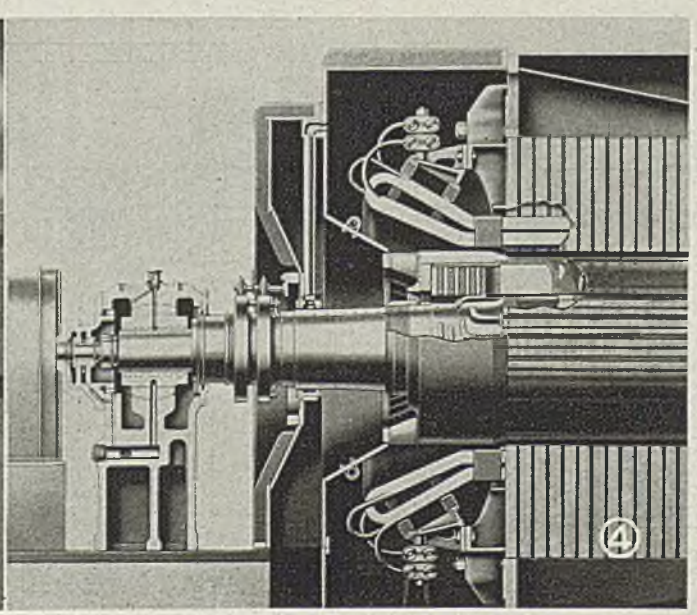
Fig. 1—Axial crack in bore of this rotor coil retaining ring developed during pressure testing. Previous physicals on forging test coupons showed acceptable results

Fig. 2—Rotor end rings on this 1500 rpm 25,000 kw generator rotor are over 4½ ft in diameter and 2 in. thick

Fig. 3—Closeup of the rotor end ring of an 1800 rpm 80,000 kw generator rotor. Rings such as these formerly were imported, but a few years before the war Allis-Chalmers began making its own rings. Overall rotor diameter and resultant internal running stresses can be reduced greatly by making rings from nonmagnetic steel

Fig. 4—Cross-sectional view of end of typical generator showing rotor coils and retaining ring





is the oil chamber. Item 3 shows the method of sealing the oil under pressure, the main feature of this seal is the U leather which is the main seal. Item 4 illustrates the stud bolts which are used to hold the assembly together. Item 5 is the pressure gage and item 6 is the high pressure pump, manually operated for close control.

When the test rig is completely set up with the forging to be tested in place, dial indicators (not shown) are placed around the circumference of the forging at the axial center of the forging and are set at zero. Pressure is then applied to test the ring in 1000 lb steps, except near the yield strength point where readings are taken at every 500 lb increase in pressure. At each increment of pressure increase, the indicators are read and values are recorded. The maximum pressure used is a pressure which is calculated to slightly exceed the yield point. We have been successful in sealing oil under pressures of 14,000 psi. The indicator readings are then averaged and a curve, pressure vice versa radius expansion in inches, is plotted. This gives a typical stress-strain curve, such as that shown on the left in Fig. 5.

The forgings are usually subjected to two cycles of pressure testing. Examination of the curves readily shows the effect of cold working with the increased yield strength and elastic limit.

The formula used for figuring the stress and pressure relationship in a thin walled cylinder is as follows:

$$S \text{ (at bore)} = \frac{R^2 + r^2}{R^2 - r^2} (P)$$

Where S = stress in psi
R = outer radius in inches,
r = the inner radius in inches
P = pressure in psi

After pressure testing, the (*Please turn to Page* 150)

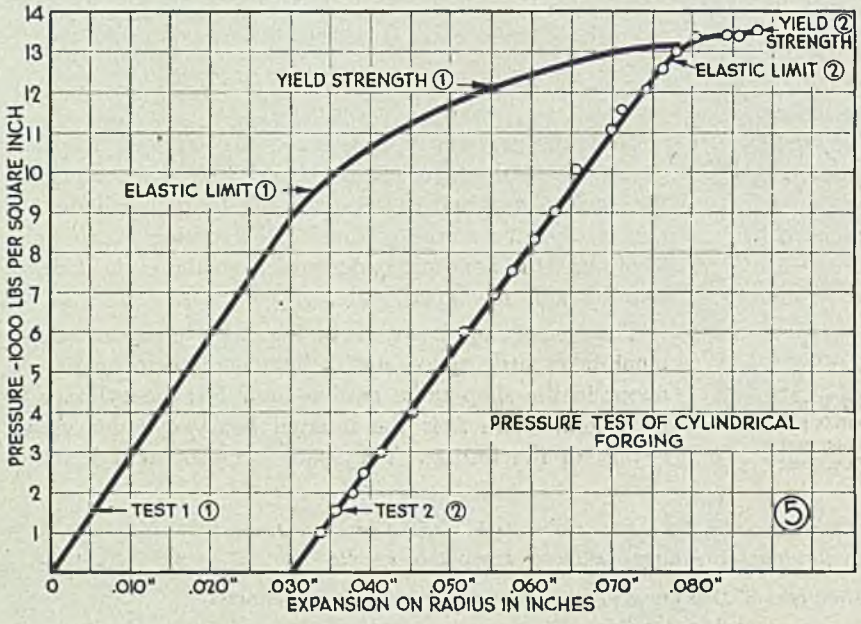
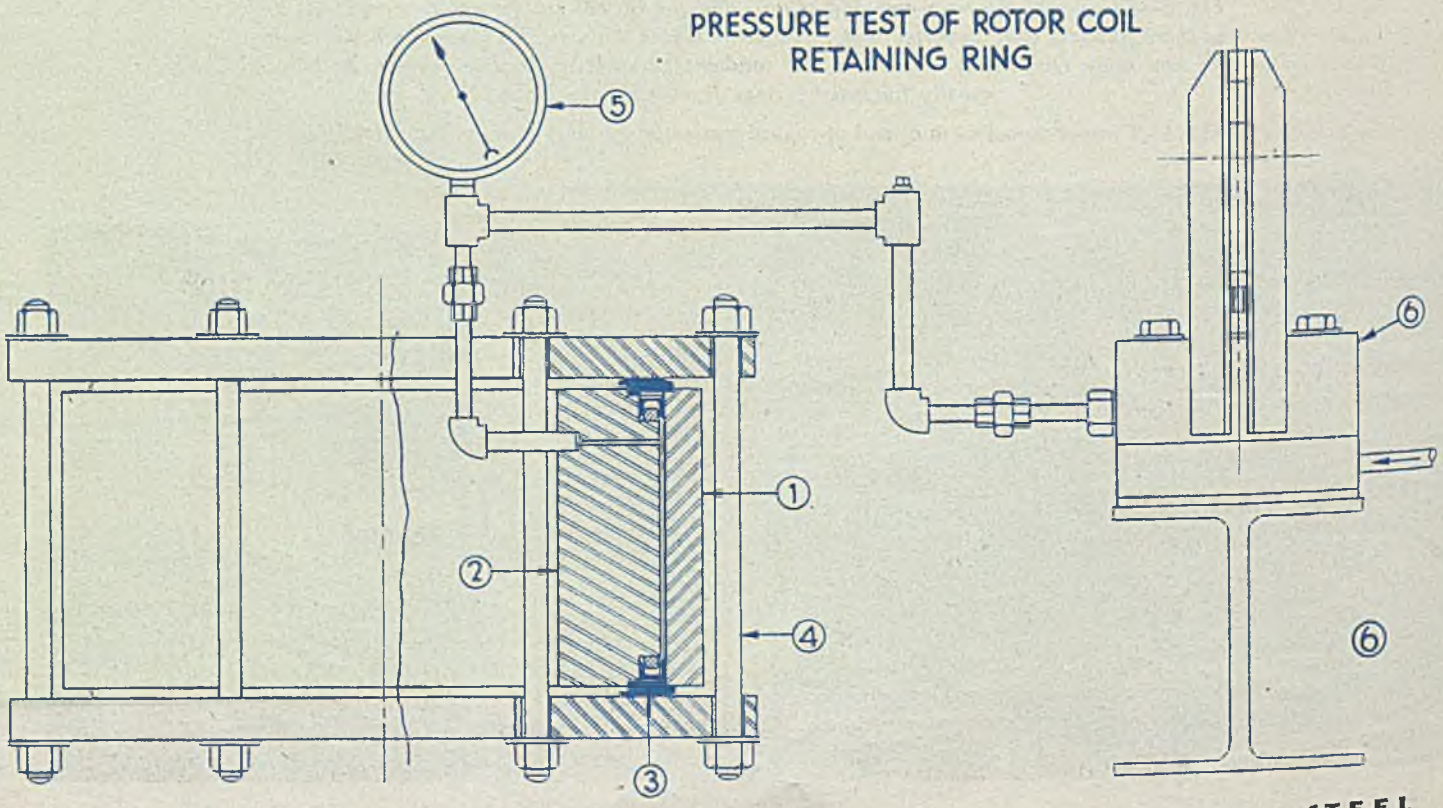


Fig. 5—Typical stress-strain curve developed by test

Fig. 6—Schematic of setup for pressure testing rotor coil retaining rings. Item 1 is cylinder for testing; 2 is heavy cylinder and part of test rig; 3 illustrates method of sealing oil (U leather) under pressure; 4, are stud bolts to hold assembly together; 5 is pressure gage; and 6 is high pressure pump, manually operated to obtain close control



Engineering News at a Glance

LATEST addition to the Springdale generating plant of West Penn Power Co. is an 81,250 kva Westinghouse generator which raises capacity of the plant to approximately 300,000 kw, sufficient to satisfy the needs of over half the entire West Penn system supplying electricity to western Pennsylvania. Besides being one of the largest machines in the system, it also is one of the largest units manufactured and installed to date for operation at 3600 rpm.

FIRES on diesel-electric locomotives, that might be whipped to dangerous proportions in winds caused by "streamliner" speeds, are detected promptly and extinguished by new equipment installed on engines that pull such famous Florida trains as the Silver Meteor, Sun Queen and Palm Land for the Seaboard Air Line railway. The equipment, developed by C-O-Two Fire Equipment Co. and Pyrene Mfg. Co., turns a diesel-electric locomotive into a veritable "fire-engine-on-wheels" since the apparatus automatically kills both smoldering and fast-burning fires underneath or inside the locomotive and even inside the cab.

BASIS for a new contract parts service now offered by Square Surface Plate & Tool Inc., Detroit, is a specialized Swiss unit that produces difficult multidiameter parts of virtually any length at an extremely low production cost. By means of this attachment, which goes on any lathe, the company states it is able to produce parts from a needle point to 5/8-in. in diameter to almost any form with semi or unskilled labor. Another feature contributing to economy as well as exceptional accuracy is the unusually low cost of tooling. Form to be produced is ground on a small flat cam which is inserted into the machine and serves as a feed guide. By storing the cam for each job, it is possible to duplicate any job literally at a moment's notice. Any kind of cold finished stock can be handled, including stainless, ordinary cold-rolled steel, brass, aluminum etc.

IN making parts for Packard superchargers, Warner & Swasey Co. of Cleveland discovered GE Calrod heaters efficient aids in removing copper plating which was applied to keep certain part surfaces in a relatively soft state. Method employs a series of four stripping tanks—two filled with the stripping chemicals and electrically heated with the heaters, and two filled with water for rinsing. Heated tanks removed the plating previously applied for an earlier hardening process. Installation not only was simplified, but also fire and fume hazards were eliminated by the heaters.

ALL manganese steel welded type dippers currently manufactured by American Manganese Steel Division of American Brake Shoe Co., Chicago, are reported to meet demands for a dipper with optimum durability and overall weight. Overlapping, rabbeted joints in the design, provide grooves for a welded bead. Parts then are fitted together with round plugs, around which weld metal is deposited. Consequently, body of the all manganese dipper is as strong and homogeneous as if made in one piece. At the same time, the company reports, it is possible to remove a worn front and reweld a new one in place without destroying the back.

TWO new low-temperature silver brazing alloys currently offered by Handy & Harman of New York, are said to offer advantages of alloys with a higher silver content, but at the same time provides an economy to help offset the increase in price of silver. Its 45 per cent silver alloy, which also contains copper, zinc and cadmium, features a new low melting range of 1120 to 1145° F, and joints produced between ferrous and nonferrous metals are strong, ductile and leak tight. The 35 per cent alloy has a wider melting range—1115 to 1295° F—and is free flowing at an exceptionally low temperature.

RESOURCEFULNESS of naval technicians converted a great wartime plant in Maspeth, Long Island, to peacetime production, thus possibly saving it from becoming a white elephant on the hands of the Defense Plant Corporation. There essential Navy *materiel* either damaged by wear or by superficial impairment while in storage is being made fit for reuse, and already has netted the national treasury many millions of dollars.

PLASTICS material that is made to shrink on handles and grips of pliers, wrenches and wire cutters is one of the latest developments announced by the Chemical Department of General Electric Co., Pittsfield, Mass. The material is applied after it is immersed in a special dilator solution which causes it to expand half again its normal size. When thoroughly dry, it shrinks to smaller than its original size to form a tight fit over the handles. The plastic is said to be unaffected by temperature and humidity, and will not split or crack when being applied.

FROM Worcester, Mass., Norton Co. reports that, in grain or powdered form, the product Norbide is the hardest manufactured abrasive known—doing work that previously required the use of diamond dust. In molded form it resists abrasion and can be used where an exceedingly hard surface is desirable. Made of carbon, in form of coke, and boric acid it is formed by tremendous heat. Its hardness is next to the diamond; it is also self-bonding and resistant to corrosion.

ONE of the latest applications of plastics is the use of Lucite acrylic resin in the manufacture of plating barrels of the type employed in plating small pieces by the tumbling method. Plastic barrel now being made by Hardwood Line Co. of Chicago, is formed under heat and pressure into a hexagonal cylinder with seamless edges. The barrel has no obstructing ribs and crevices, and permits free movement of parts during plating and unloading.

Preserving Artillery Pieces

Another chapter on combating corrosion, the following discussion detailing low-cost procedures used in preparing heavy gun parts for long-term storage in welded steel containers may offer worthwhile suggestions to many metalworking plants

By W. H. WALTER
Assistant Mechanical Engineer
American Bridge Co.
U. S. Steel Corp. Subsidiary
Pittsburgh

VALUE of long-term storage of artillery materiel under conditions requiring the least possible maintenance is twofold—strategic and economic.

From an economic point of view it was extremely desirable to study methods of preserving latest types of artillery *materiel*. It was essential these methods should be low in cost and involve a minimum of field maintenance; also that transportation and storage area costs should be low and, above all, that the preservation method should be adequate to protect the *materiel* without deterioration over long periods.

Before cessation of hostilities in Europe, American Bridge Co., subsidiary of United States Steel Corp., at the request of the Army Ordnance Department, conducted experiments on welded steel containers which could store various types of artillery *materiel* in inert atmospheres. Study of the factors which might lead to deterioration by corrosion or oxidation led to the conclusion that the final atmosphere within the containers should contain less than 1 per cent of oxygen and have a relative humidity of not more than 10 per cent at zero degrees Centigrade. It was also predicated that the containers would have to be stored in ambient temperatures ranging from minus 60° to plus 170° F.

Among the inert gases investigated, dry nitrogen appeared most suitable from the viewpoint of inertness, availability and economy. It also appeared desirable that a positive gas pressure should be maintained under even the lowest temperature conditions. This would minimize damage that might occur due to accidental mishandling. Inclusion of a dehydrating agent in the final sealed container also was considered highly desirable as both the equipment and the container itself would release small quantities of water vapor which could not be removed economically by preliminary drying.

It was the original desire and intention of the Ordnance Department to have all major combinations stored within containers with as little breakdown as possible from the traveling position. Experimental containers for housing guns in this condition were designed and constructed. Following inspection, it was found that too much waste space was involved in this type of storage. It was then decided to disassemble major combinations and pack them so waste space within the container would be at a minimum. Instructions were to disassemble the guns to such an extent that reassembly would be brought within the scope of second echelon troops (See Figs. 6, 7).

It was considered necessary that recoil mechanism of artillery other than anti-aircraft be exercised or gymnasticated periodically to prevent corrosion and freezing of the pistons in position. General scheme adopted to permit gymnastication of the recoil mechanism from outside the container without disturbing packed contents was to connect the counter recoil cylinder, through flexible metal hose, to the external side of the case by removing the counter recoil cylinder head and substituting a special plug for the purpose. Through the external connection a special noncorrosive cylinder oil, supplied by the Army, was pumped into the cylinder, simulating a condition of slow recoil.

First step in preparing material for packaging was removal of the vinylite strippable film. Before original application of the film it was necessary to remove all paint to bare metal to insure bond of the vinylite at points where the film comes in contact with the gun. At such points the vinylite had to be scraped away, the metal power wire-brushed and thoroughly cleaned with a vinylite solvent, and repainted with a prime and finish coat. Heavy cosmoline protective coatings were removed from all machined surfaces and were replaced with low viscosity rust-inhibitive oils.

All accessible rust spots were cleaned to bare metal and repainted. Where rust conditions were found in places not accessible, except through excessive disassembly, notes of such conditions were included in the engineering report packaged with each container as evidence that such corrosion did not take place during storage. All machined surfaces were washed with ethyl alcohol to remove fingerprint stains. Lenses were washed with the proper solvent and thoroughly dried before storage. Grease spots were removed with solvent and at such points the paint was removed, new prime and finish coats were applied.

Containers originally were designed and constructed

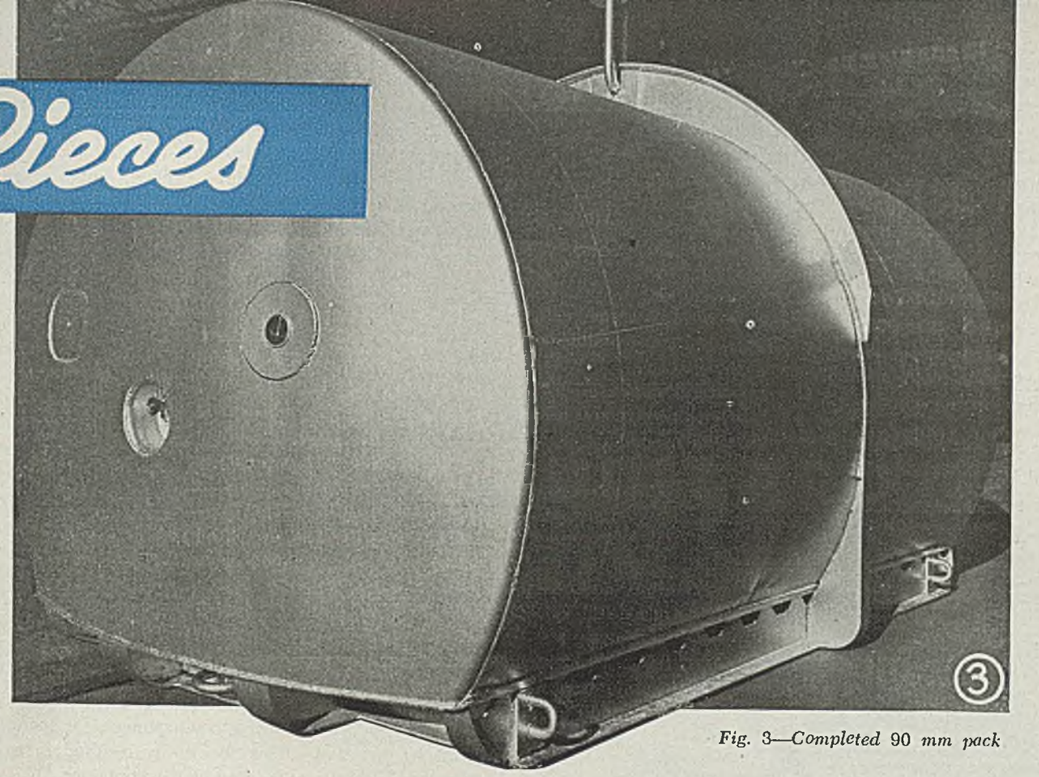
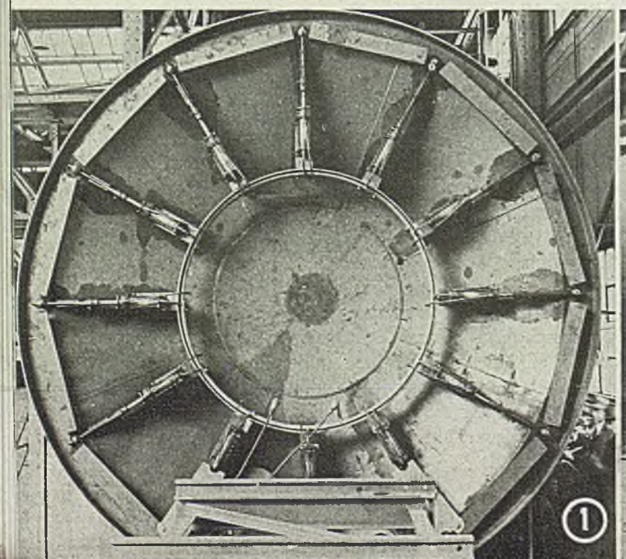
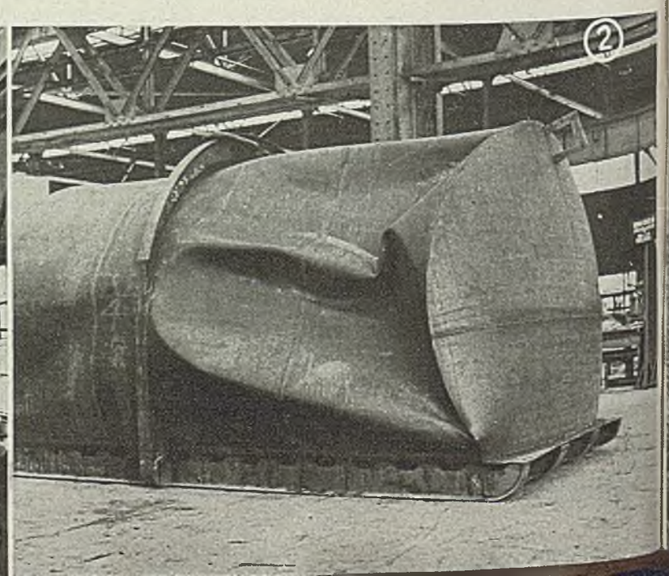
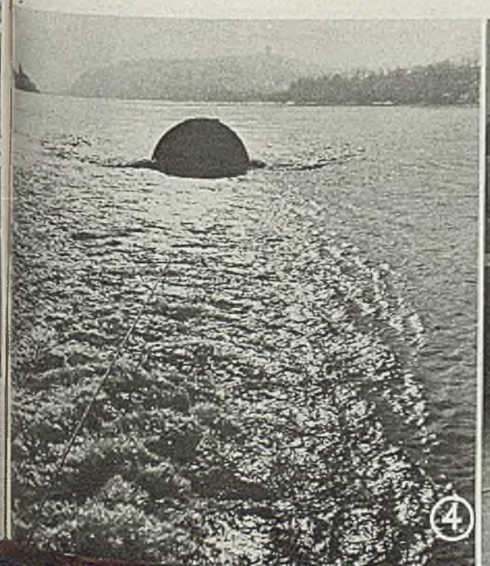


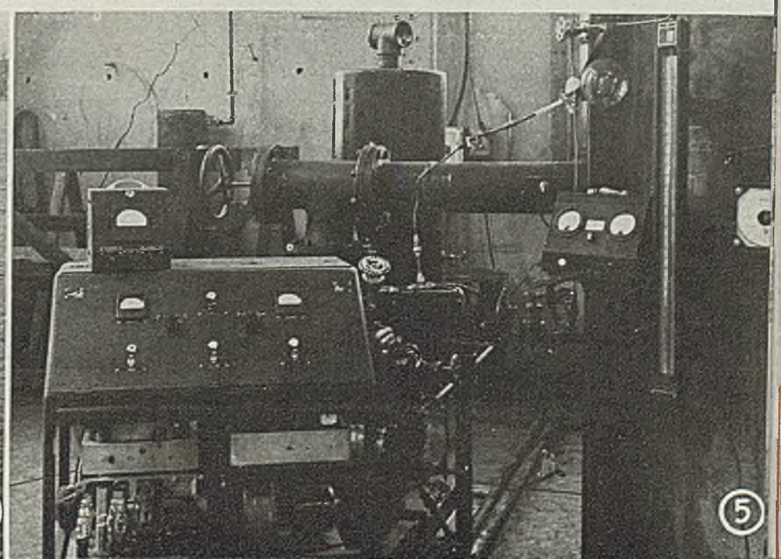
Fig. 3—Completed 90 mm pack

Fig. 1—View of decompression chamber
Fig. 2—Experimental container collapsed under vacuum
Fig. 4—Completed 90 mm AA pack being towed in the Ohio river
Fig. 5—Mass spectometer used for making overall tests of finished containers









for the 90 mm, AA, MlAl mount, on the basis of having the gun disassembled from traveling position to as small an extent as possible, and of having sufficient strength to withstand maximum gas pressure imposed by the original ground rules. In order to conform to the specification that the container should be under positive pressure when stored at minus 60° F, it was necessary to design for a maximum of 10 psi gage pressure, a condition which would be imposed by storing at a temperature of 170° F.

Containers were designed and built with semi-cylindrical envelope with straight sides and flat ends in both welded and bolted end constructions, with cylindrical envelope and flat ends, with cylindrical and semi-spherical ends, and with a cylindrical envelope having dished ends. Various types were tested to destruction under internal pressure and a study of all results indicated the most economical type of design for all major combinations, except the 75 mm pack howitzer, was the cylindrical envelope with dished ends such as is shown in Fig. 3.

Bases were designed on the theory that it was advisable to allow more than sufficient metal in the skids to permit some loss of metal due to corrosion during storage over a long period of time. Half rings for dragging were welded at each end of base. On the sides, at each of the four corners, half rings were provided for lashing to decks during transportation by ship. Each container was provided with a lifting ring in a bail located at the center of gravity of the loaded container.

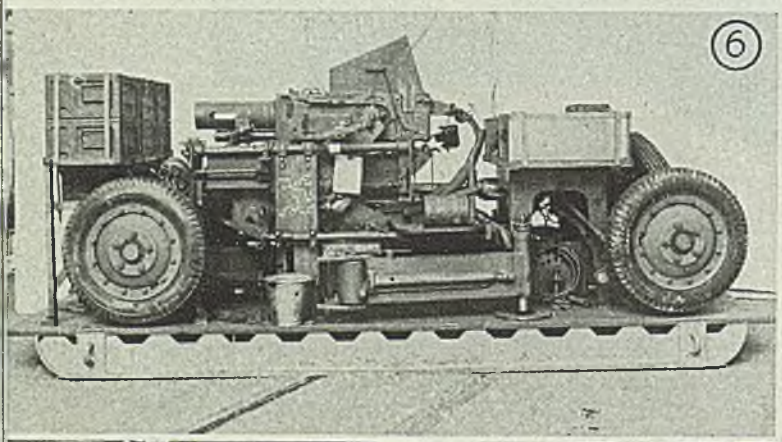
Tests of the cylindrical type container with dished ends resulted in failure under internal pressure at 43 psi. The same type container collapsed under 6 in. of Hg absolute pressure. See Fig. 2. The rectangular type container used for the 75 mm pack howitzer resisted collapse when the internal pressure was taken down to 1 in. of Hg.

In order to test the ability of the welded steel containers to preserve the pressure under which they were originally placed, two full packed 90 mm MlAl mounts were shipped on a flat car from Ambridge, Pa. to the West coast and returned. The car traveled about 6300 miles over six different railroads and, after a six weeks' trip, returned to Ambridge with all original conditions unchanged.

Upon their return one of the containers as shown in Fig. 4 was placed in the Ohio river and towed for 5 miles. Subsequent containers for all five types of material included in the pilot production order were placed in the river and all floated without any list with the exception of the 75 mm unit. The most economical container of this design imposed the building of stowage compartments for spares and canvas on one side. This necessarily resulted in an unsymmetrical transverse loading of the container.

Two identical containers were each loaded with masses of steel simulating a gun. One was insulated on the interior with ¾-in. thick fiber glass. Thermocouples were placed on the skin of each container. Two thermocouples were suspended in each container within the shell, one about 3 in. from the shell plate and one near the center of the container. One thermocouple was placed in the metal simulating the gun in each container. Two thermocouples were suspended in the outside air, one in the shade and one exposed to the sun.

Under these conditions the two containers were placed in identical exposures, and temperature readings were taken from all thermocouples (*Please turn to Page* 127)



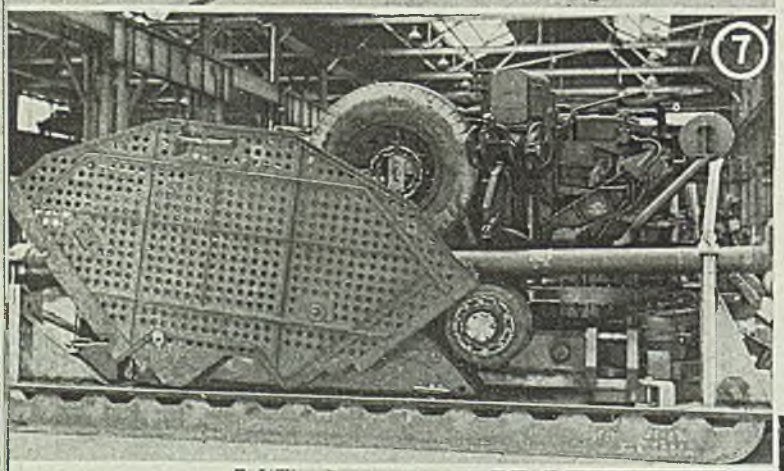
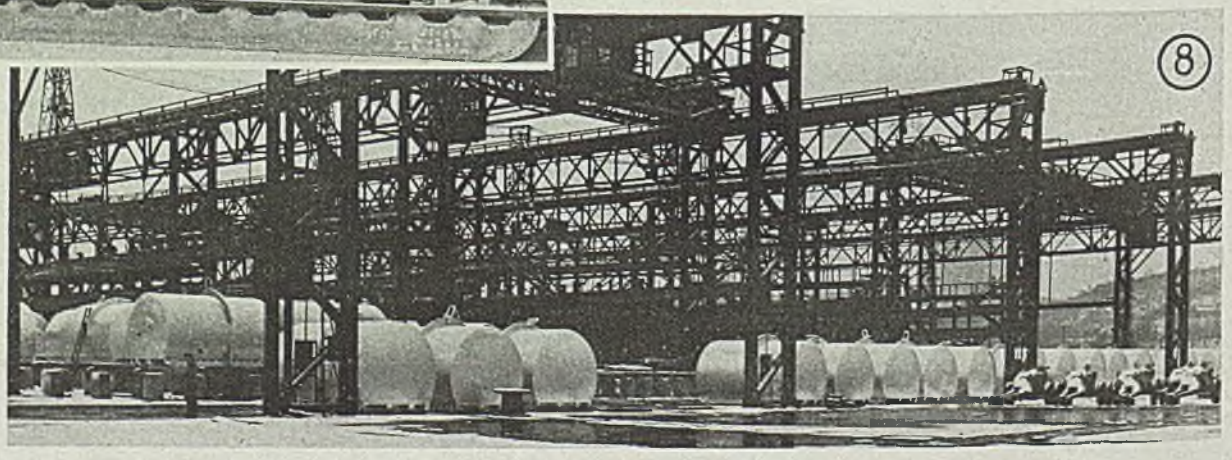


Fig. 6—Palletized 40 mm AA, mount M2A1 shown ready for "packaging"

Fig. 7—Palletized major combination ready for "packaging". (90 mm AA, mount M1A1)

Fig. 8—Completed 90 mm AA packs awaiting shipment



HEAT TREATING Aluminum

In this concluding article of a series of five, additional heat treating cycles and practices are described. Equipment, heating media, temperature controls, etc., also are discussed

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ALUMINUM alloys are in a comparatively soft state immediately after quenching from a solution heat-treating temperature. To obtain their maximum strengths, they must be aged or precipitation hardened. During this hardening and strengthening operation, precipitation of the soluble constituents from the supersaturated solid solution takes place. As precipitation progresses, the strength of the material increases, often by a series of peaks, until a maximum is reached. Further aging (overaging) causes the strength to steadily decline until a somewhat stable condition is obtained.

Precipitation hardening produces a large increase in the strength and hardness of the material with corresponding decreases in the ductile properties. The process used to obtain the desired increase in strength is therefore known as aging or precipitation hardening.

Strengthening of the heat-treatable alloys by aging is not due merely to the presence of a precipitate. Instead, it is due to both the uniform distribution of a finely dispersed submicroscopic precipitate and the distortion and other effects of its formation upon the crystal structure. The aging practices used depend upon many properties other than strength. As a rule, the artificially aged alloys are slightly over-aged to increase their resistance to corrosion. This is especially true with the artifically aged high copper-bearing alloys that are susceptible to intergranular corrosion when inadequately aged.

Heat-treatable aluminum alloys are subdivided into two classes—those that obtain their full strength at room temperature, and those that require an artificial aging treatment.

Alloys that obtain their full strength after aging 4 or 5 days at room temperature are known as natural aging alloys. Precipitation from the super-saturated solid solution starts soon after quenching, with 90 per cent of the maximum strength generally being obtained in 24 hours. Alloys that require a precipitation thermal treatment to develop their full strength are referred to as artifically aged alloys. However, these alloys also age a limited amount at room temperature, the rate and extent of the strengthening depending upon the alloys.

Many of the artificially aged alloys reach their maximum natural or room temperature aging strengths after a few days and can be stocked for fabrication in the "W" temper. Others continue to age appreciably over a long period of time (e.g. some of the high zinc-bearing alloys), their mechanical property changes being insufficient to cause their formability to be constantly reduced. Consequently, they are not stocked in the "W" temper. The advantage of "W" temper

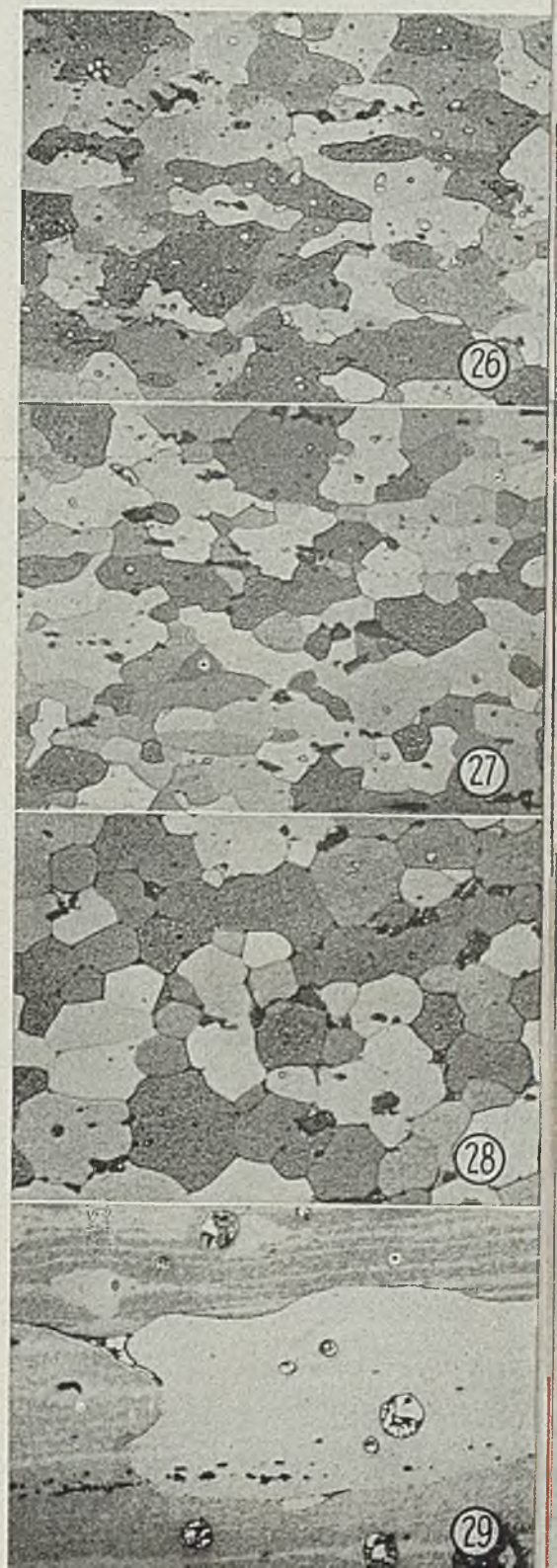
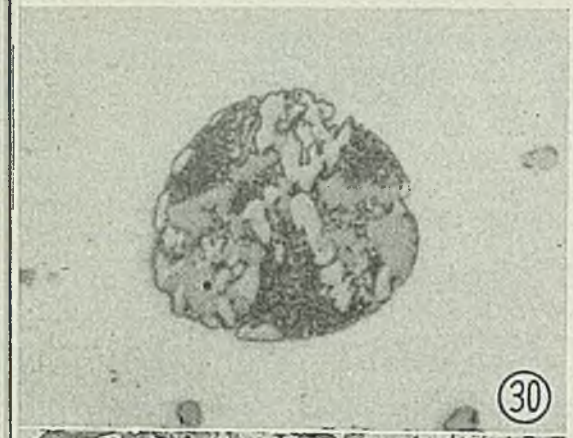


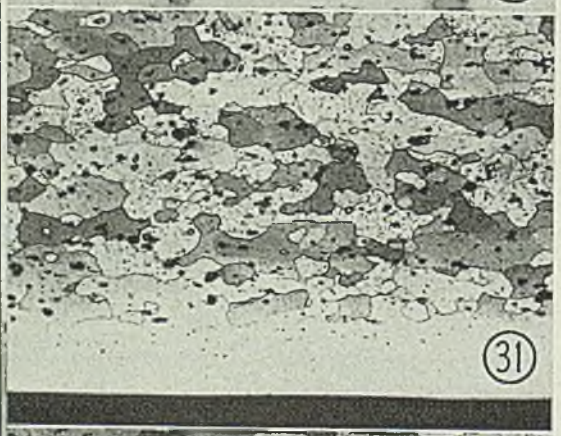
Fig. 26—Structure of heat treated aluminum alloy R301. Here insufficient temperature has left some of the soluble constituents, namely $CuAl_2$ (white), out of solution. Keller's etch, X 500

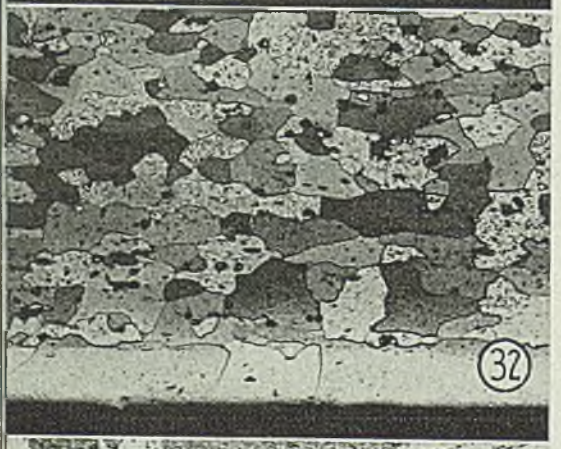
Fig. 27—Normal structure of properly heat treated aluminum alloy R301. Use of correct temperature has resulted in virtually complete solution of constituents. Keller's etch, X 500

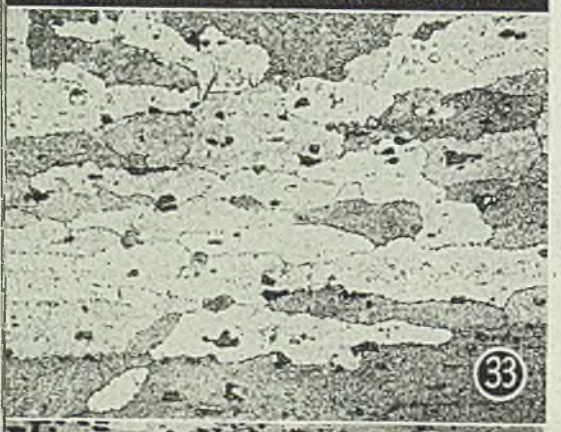
Fig. 28—Structure of incorrectly heat treated aluminum alloy R301. Excessively high temperature has resulted in melting of certain constituents at grain boundaries. Keller's etch, X 500

Fig. 29—Incorrectly heat treated aluminum alloy R301. Here the eutectic has melted in form of "rosettes" (circular spots) and also at the grain boundaries. Caused by excessive temperature. Keller's etch, X 500









formability can be utilized, however, in the same manner as with natural aging alloys, and that is by fabricating shortly after solution heat treatment or by the use of refrigeration. Refrigeration retards the rate of natural aging. At 32° F, the beginning of the aging process is delayed for several hours, while dry ice aging (−0 to −100° F) retards aging for an extended period of time.

The strengths of the natural aging alloys can be increased by subjecting the naturally aged material to a precipitation thermal treatment. Although a considerable decrease in the per cent elongation is obtained, it is not considered detrimental for many applications.

Presence of small amounts of cold work, subsequent to natural aging but prior to artificial aging, has a pronounced effect on the strength of 24S. The increase in strength realized by this method is dependent upon the degree of cold work present.

Artificially aging the natural aging alloys increases the susceptibility of the material to intergranular corrosion. For this reason, the process is generally confined to cladded sheet, extrusions and similar products.

Mechanics: Natural aging alloys 17S and 24S require only exposure at room temperature for several days to develop their full strengths. The other commercial heat-treatable alloys require a controlled precipitation thermal treatment to develop their full strengths.

Degree of strengthening of a properly solution heat-treated alloy by precipitation or aging depends upon both time and temperature. An increase in temperature decreases the time necessary to obtain maximum hardening. Thus, there may be several aging practices applicable to an alloy (note Table II). Use of higher temperatures and shorter times generally produces lower elongations and higher yield strengths whereas the lower temperature procedures give higher elongations with slightly lower yield strengths.

The elapsed time between quenching from solution heat-treating temperature and artificially aging has an effect on the mechanical properties obtained but is, at present, commercially important only with the high zinc-bearing alloys such as R303. This alloy requires an incubation period of at least 24 hours at room temperature prior to the precipitation thermal treatment to obtain the desired mechanical properties.

Precipitation Practices: Temperatures used for precipitation hardening depend upon the alloy and the properties desired, ranging from 250 to 375° F. They should be controlled within a very narrow range (5° F) to obtain best results. See Table II. Time at temperature, referred to as the soaking time, is dependent upon the temperature used, the alloy and the properties desired. It ranges from 6 to 24 hours. Increasing the aging temperature decreases the soaking period necessary for proper aging. However, a closer control of both time and temperature is necessary when using the higher temperatures.

Rate of heating is not critical, but the material should be placed in the furnace in such a manner that a large temperature differential between various parts of the load will not exist for an extended period of time. If this occurs, part of the material will receive an incorrect aging treatment.

After receiving the precipitation thermal treatment the material should preferably be air cooled to room temperature. Water quenching, while not necessary, produces no deleterious effects. Furnace cooling has a tendency to produce overaging.

Solution heat treating and artificial aging processes are so closely connected that it is difficult to distinguish between the difficulties that may be associated with each. It is advisable to check thoroughly the solution heat-treating procedures employed when difficulties arise in conjunction with the precipitation treatment.

Difficulties which may be encountered when artificially aging properly solution heat-treated material are:

Low Tensile and Yield Strengths. Causes may be (a) insufficient time or

Fig. 30—Large rosette in incorrectly heat treated aluminum alloy R301 indicates eutectic melting caused by excessive temperature. Keller's etch, X 1750

Fig. 31—Showing normal amount of diffusion of copper and other soluble constituents into the high purity cladding or covering of Pureclad 24S, resulting from correct heat-treating cycles. Keller's etch, X 500

Fig. 32—Excessive (100 per cent) diffusion of copper and other soluble constituents into the high purity cladding or outer covering of Pureclad 24S. Excessive time at temperature caused this undesirable structure. Keller's etch, X 500

Fig. 33—Structure resulting from poorly quenching solution-heat-treated aluminum alloy 24S. Note lack of grain contrast and precipitation at grain boundaries. Keller's etch, X 500

Fig. 34—This structure reveals the attack produced by heating in an improper furnace atmosphere, usually associated with product of combustion in direct gas-fired furnaces, or excessive water vapor. This (high-temperature oxidation) was produced in 24S-T. Keller's etch X 100

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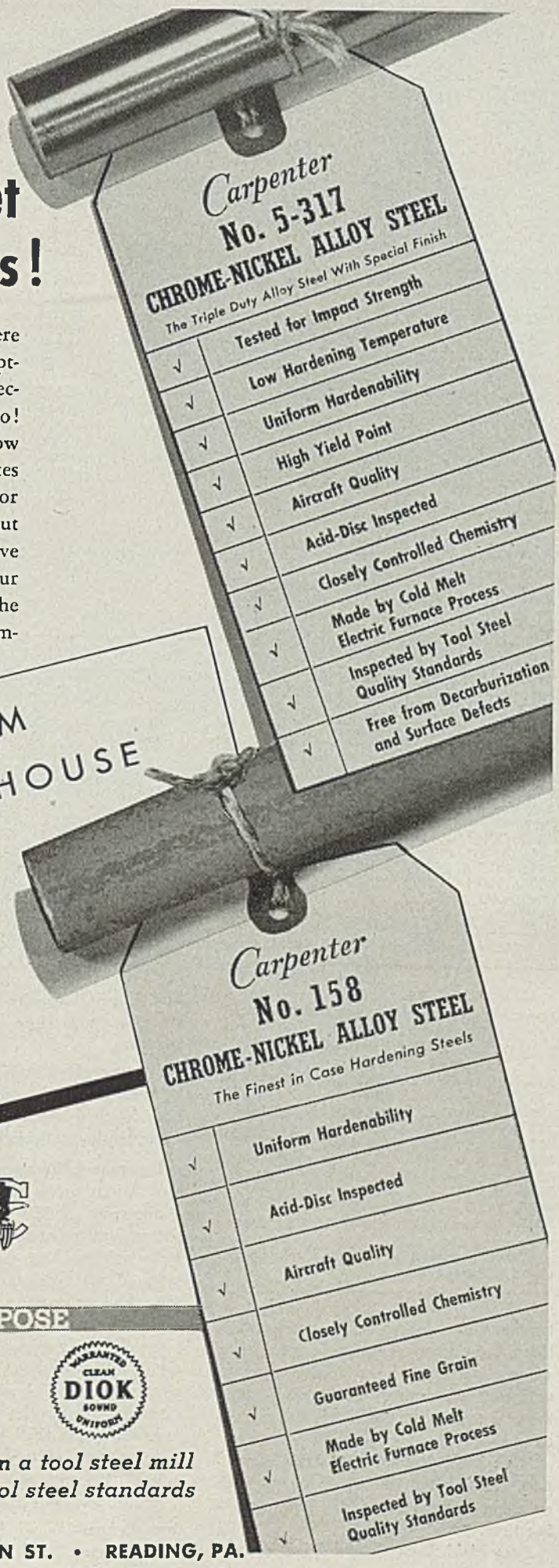

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TABLE II

HEAT TREATING CYCLES

Alloy	Solution Heat Treatment: Soaking Temperature °F	Quench	Temper Designation‡	Precipitation Treatment (Aging): Aging Temperature °F	Aging Time Hours	Temper Designation
2S		Not Heat Treated		Not Heat Treated		
3S		Not Heat Treated		Not Heat Treated		
14S	930-945	Cold Water°°	W	360±5	5	T
				350±5	8	
				340±5	10	
				320±5	18	
17S	930-950	Cold Water	None	Room	96-120	T
18S	950-970	Water or Oil	W	340±5	10	T
24S	910-930	Cold Water	None	Room	96-120	T
Pureclad-(Alclad)†						
24S 24S	910-930	Cold Water	None	Room	96-120	T
				340±5	12	
25S	955-975	Water or Oil	W	290±5	18	T
32S	950-970	Water or Oil	W	340±5	12	T
A51S	960-980	Water or Oil	W	350±5	8	T
				320±5	18	
52S		Not Heat Treated		Not Heat Treated		
R301 (Alclad)† 14S	930-950	Cold Water	W	350±5	8	T
				320±5	18	
R303° (75S)†	810-840	Cold Water°°	None	315±5	8	T315
				275±5	25	T275
R317	930-950	Cold Water	None	Room	96-120	T
R353 (53S)†	960-980	Cold Water	W	320±5	18	T
				350±5	8	
R361 (61S)†	960-980	Cold Water	W	320±5	18	T
				350±5	8	

° Precipitation treatment should not be started until at least 24 hours after completion of solution heat treatment.

°° Hot water for extra heavy forgings.

‡ When in the stable condition.

† Other types similar to those listed, are enclosed in parenthesis.

TABLE III

SOAKING TIME FOR SOLUTION HEAT TREATMENT OF WROUGHT PRODUCTS (EXCEPT FORGINGS)

TIME IN MINUTES

Alloy	Thickness up to 0.032 in.	Thickness 0.032-0.125 in.	Thickness 0.125-0.250 in.	Thickness Over 0.250 in.
14S	...	...	30	60
A17S	20	20	30	60
17S	20	20	30	60
24S	30	30	40	60
Pureclad 24S (Alclad 24S)†	20	30	40	60
R353 (53S)†	20	30	40	60
R361 (61S)†	20	30	40	60
R301 (Alclad 14S)†	20	30	40	60
R303 (75S)†	20	30	40	60
Clad R303	20	30	40	60
R317	20	30	40	60

†Other types, similar to those listed, are enclosed in parenthesis.

TABLE IV

SOAKING TIME FOR SOLUTION HEAT TREATMENT OF FORGINGS

TIME IN HOURS

Alloy	Thickness up to 2 in.	Thickness Over 2 in.
14S	½-6	2-12
17S	½-6	2-12
18S	½-6	2-12
25S	3-6	2-12
32S	½-6	2-12
A51S	½-6	2-12
R353 (53S)†	½-6	2-12
R303 (75S)†	½-6	2-12
R317	½-6	2-12

†Other types, similar to those listed, are enclosed in parenthesis.

temperature during the precipitation thermal treatment, commonly referred to as under-aging; (b) excessive time or temperature during the precipitation thermal treatment, commonly referred to as over-aging.

High Yield Strength and Low Elongation. Cause often is the use of too high an aging temperature, or too long a soaking time.

Low Yield Strength and High Elongation. Cause is usually the use of too low an aging temperature, or too short a soaking time.

Intergranular Corrosion. Cause is usually improper aging, particularly with the high copper-bearing alloys. Slightly over-aging tends to alleviate this difficulty.

Equipment: Temperatures required for the various aging treatments vary from a minimum of 250° F for precipitation thermal treatment to a maximum of 980° F for solution heat treatment. This wide range of temperatures, in conjunction with the close temperature control required and in some cases the fast heating rate necessary to produce fine grained material, makes it desirable to consider the equipment for each of the thermal processes separately. However, it should be kept in mind that equipment for one type of thermal treatment may also be suitable for another.

Heating media used are divided into two groups—liquid baths and gaseous atmospheres. Each has distinct advantages and disadvantages, making the choice dependent upon the application. Air furnaces are ideal for precipitation thermal treatments and for annealing. Furnace designs are simple. Construction, maintenance and operating costs are reasonable. Metallurgical control is generally easy to maintain at a satisfactory level. Also, these are readily adaptable for solution heat-treating procedures, particularly where substantial quantities of relatively large pieces are involved. Air furnaces are also generally used if several alloys are to be heat-treated with the same equipment since the temperature can be raised or lowered quickly.

Initial cost of air furnaces is substantially higher than for salt baths, but operating costs are generally lower. They are efficient, clean, flexible. Warpage of large thin sections may be greater due to the greater relative specific gravity of the metal. Heating rates are slower and mixed loads of different sized material are more troublesome. Quenching with proper equipment is excellent.

Melting points of the salts used in salt baths are generally so high that they can be advantageously used only for solution heat treatment. Salt baths are ideal for solution heat treating small parts, large thin sections and mixed loads. Initial costs are low, but operating costs are generally substantially greater, due to drag out of the salts.

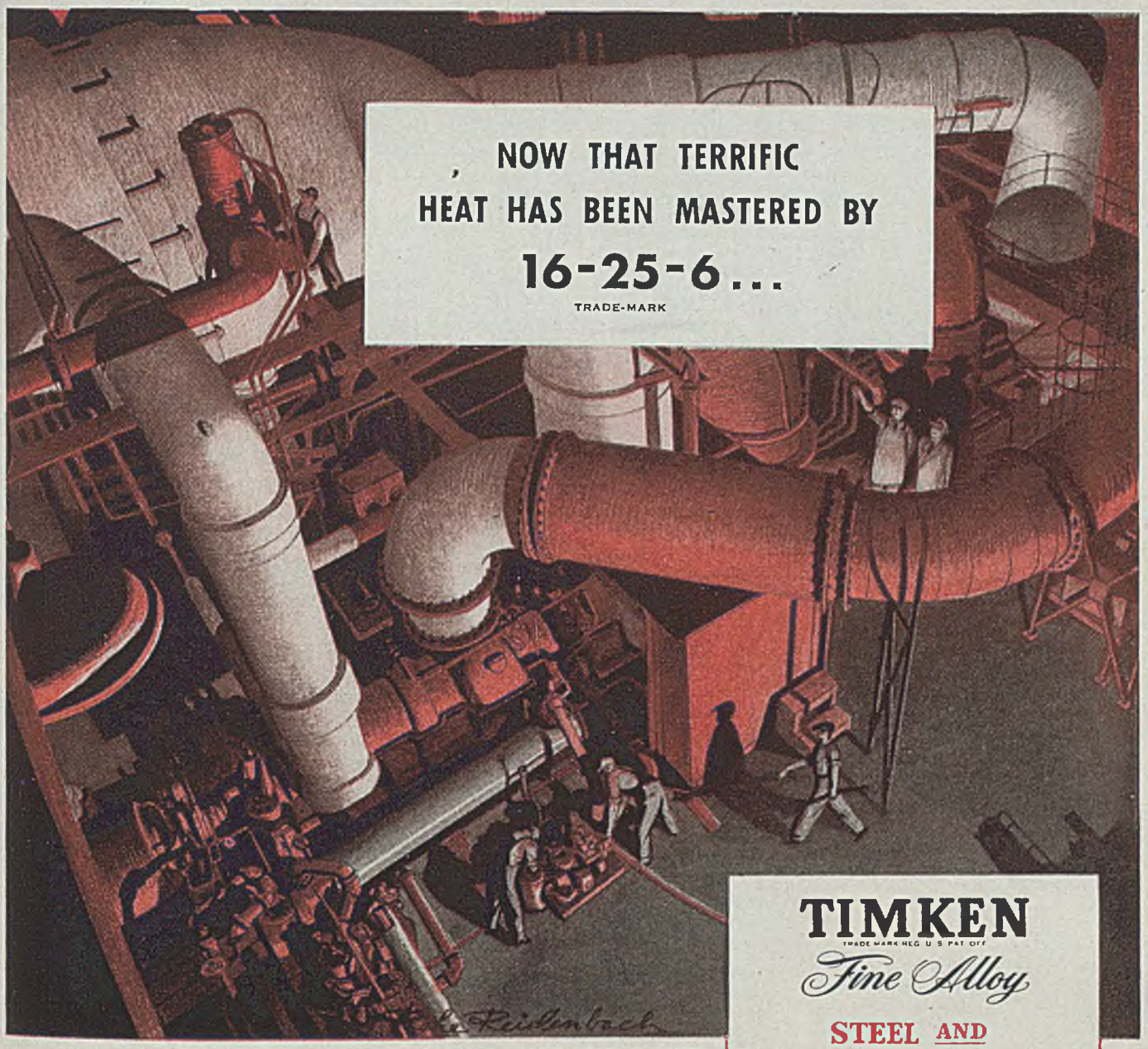
Heating rates are very fast and the bath temperature is usually very uniform. These advantages, however, may be completely overshadowed by the slower quench caused by the arrangement of the equipment and the salts adhering to the material. Salt baths must be operated with caution to prevent explosions, as any water on the work is instantly transformed to steam on immersion.

Air Furnaces: Most desirable air furnaces for solution heat treating and annealing are the recirculating air types. Heated air is recirculated at rather high velocities to obtain a rapid heating rate and a uniform temperature. The products of combustion are excluded from the furnace atmosphere.

Furnaces designed so that the products of combustion form part of all of the furnace atmosphere can be used for precipitation thermal treatments, for many annealing processes, and a few solution heat treatments. However, the presence of sulphur compounds and moisture is detrimental to aluminum, causing blistering and high temperature oxidation. The use of such furnaces is usually recommended only for precipitation thermal treatments.

Heat source may be oil, gas, or electricity, with electricity being preferred for most operations due to the resulting

(*Please turn to Page* 148)



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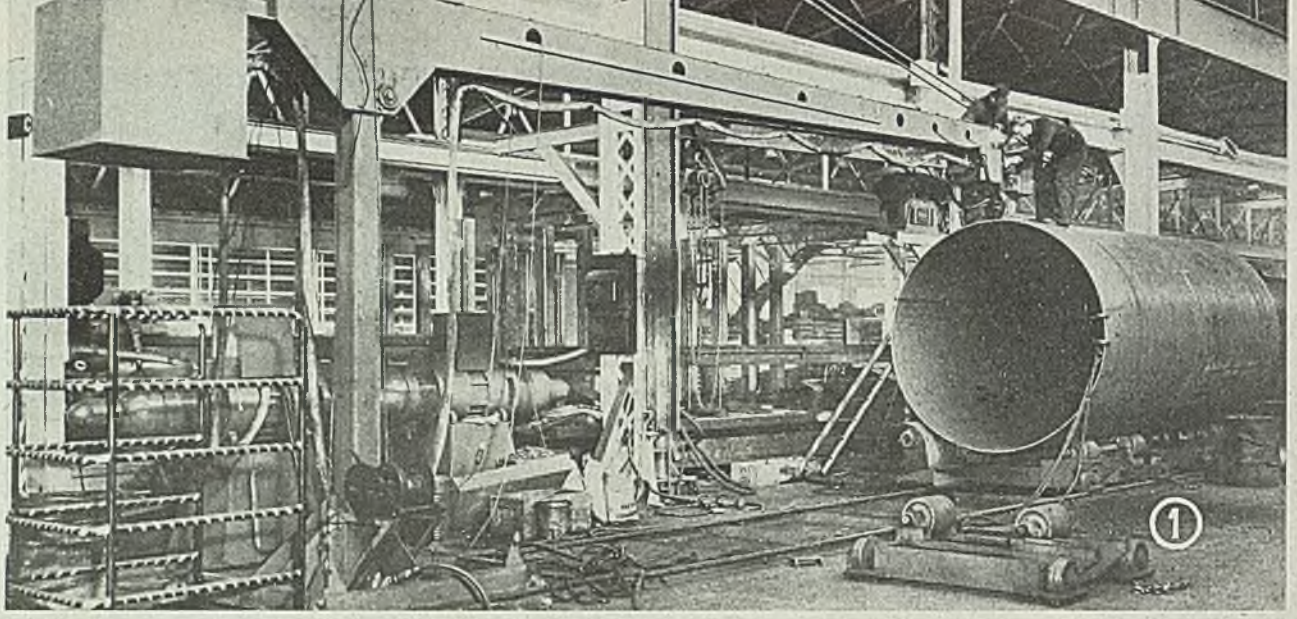

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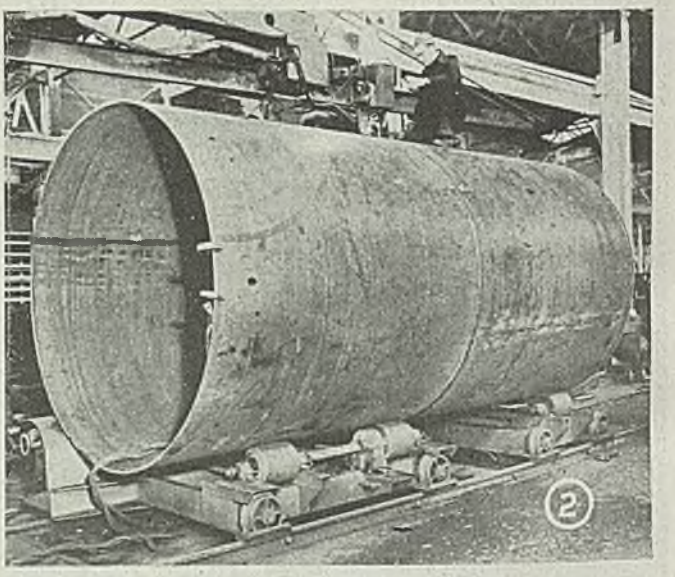

SAVINGS in boiler and tank fabrication costs up to 25 per cent over manual method of construction were effected at the Wm. Bros Boiler & Mfg. Co., Minneapolis, by installing the Lincolnweld process of automatic metallic arc welding recently developed by Lincoln Electric Co., Cleveland.

One of two such installations at the Wm. Bros company is shown in Fig. 1. It consists of the automatic welding head, control box, wire reel and flux pick-up and hopper, mounted on a boom. Shown under construction is a 200-lb pressure butane tank, 72 in. in diameter and ultimately 60 ft long.

The boom on which the automatic welding head is mounted can be adjusted up or down on the vertical column to accommodate various size jobs. Ordinarily, the work is scheduled so that all units of one size comprising a given order may be handled with maximum efficiency. Thus, all sectional parts are shaped on a bending roll, then hand tack welded and automatically finish-welded in successive operations.

One of the most interesting aspects of the automatic arc welding at this plant is the way in which the various structures are positioned and moved for welding. In this case the set-up consists of an ingenious arrangement of cars or dollies mounted on steel tracks which permit the work to be moved on a horizontal plane, or rotated at a given speed, depending on job requirements.

This entire work-handling equipment, shown in Fig. 2 was designed and built under the supervision of T. J. Warmington, former works manager now in charge of boiler sales at Wm. Bros company. Cars and rollers are powered by electric motor having a 4-speed transmission and variable speed reducer permitting a travel or rotating speed ranging from 6 to 120 ipm.

In "Lincolnwelding" the butane tank

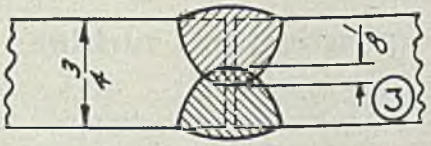

Fig. 1—Overall view of Lincolnweld installation used for welding butane tank measuring 60 ft long and 72 in. diameter

Fig. 2—Close-up of position cars and rollers used to move tank in welding both longitudinal and girth seams

Fig. 3—Cross-sectional sketch of longitudinal and girth seams

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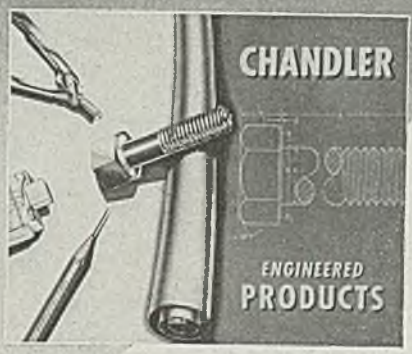

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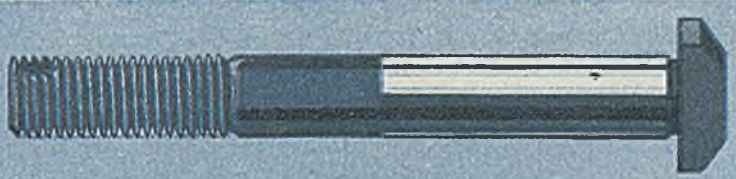

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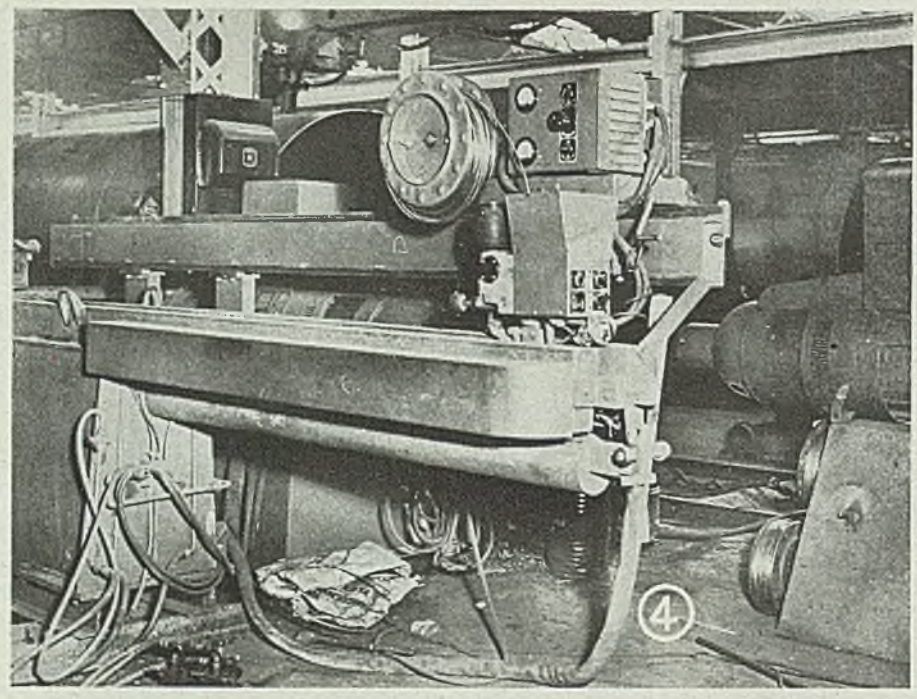

Fig. 4 — Smaller Lincolnweld mounted on beam t Wm. Bros company for welding of smaller types of structures

as illustrated in Figs. 1 and 2, each of the four sections measuring 6 ft in diameter by 15 ft in length are aligned on the fixture and first tack welded manually. Only one pass of the automatic welding arc is required on each side of the seams in this case, the wall thickness being 3/4-in. On vessels ranging greater than 3/4-in. wall thickness, two passes are applied to the outside of the joints.

Details of the welded joint as applied in the fabrication of the butane tank under discussion are shown in the sketch, Fig. 3. In this case the joint is the flush butt type, with no appreciable gap. Weld penetration on each side is sufficient to overlap the welds approximately 1/8-in. as indicated in the sketch. On material over 3/4-in. in thickness, the joint is veed at the seam to effect full penetration of the weld metal.

Note that the longitudinal seam in each section is staggered with the corresponding seam in the adjacent section to avoid possible concentration of high stress areas.

The completed structure consisting of four 15 ft section and heads welded into one integral unit as constructed by this process of automatic metallic shielded arc welding passes the U-69 boiler code requirements set up by the ASME.

A second "Lincolnweld" installation, shown in Fig. 4, designed for the welding of smaller types of structures, permits the company to handle a large variety of fabricating jobs. In addition to the construction of large size tanks such as described in this article, they are thus equipped to produce smaller types of structures such as smoke stack sections, commercial boilers, duct work and heavy sheet metal assemblies ranging in thickness from 14 gage to 1/4-in.

Latest American Standards Listed in New Catalog

Revised list of standards approved and published by the American Standards Association includes definitions of technical terms, specifications for metals and other materials, dimensions, safety provisions for the use of machinery, methods of work and tests for the finished product.

Standards throughout industry are said to represent agreement on the part of maker, seller and user in mechanical, industrial, transportation, building, textile and other fields. Some 154 American war standards are being reconsidered for their possible value in peacetime production.

Available free from the association, 70 East 45th street, New York, catalog is valuable reference material for engineers, manufacturers and sales organizations.

Illustrated Micro Switch Catalog Offered

A new publication describing the complete line and illustrating many varied uses of the product, is available from Micro Switch division of First Industrial Corp., Freeport, Ill. Said to be an excellent handbook for design and production engneers, it lists the many types of switch housings along with the varied types of actuators.

Designated as catalog No. 61, its eight sections cover switches for use with different kinds of machines and devices under all conditions in aircraft, automotive, marine and railway equipment.

Book Shows Variety of Hydraulic Press Uses

A new book containing helpful information on how the Denison Multipress, a bench-size hydraulic machine tool, can be used for a great variety of operations is being distributed by Denison Engineering Co., Columbus, O.

Included in the 13-section publication are sections on various operations the machine is capable of performing, such as assembling, trimming, pelleting, coining, blanking, straightening, etc. and different types of materials—ceramics, precious metals, plastics and fibrous products—with which it will work.

Specification Book on Waterproofing Offered

A new specification book of waterproofings, damp-proofings and concrete specialities is offered by Truscon Laboratories Inc., Caniff and Grand Trunk Railroad, Detroit. Containing both complete and short specifications, illustrations and description of company's products, it is divided into three sections: Waterproofings, including integral and iron waterproofing; damp-proofings, including clear and bituminous damp-proofing; and a miscellaneous section, describing a transparent membrane method for curing concrete, pool coatings etc.

Aluminum Industry Reviewed

The Aluminum Industry, by Stanley V. Malcuit; paper, 36 pages, 6 x 9 inches; published by Bellman Publishing Co. Inc., 83 Newbury St., Boston 8, for $1.

This monograph is No. 4 of the American Industries series and is by the head of the public relations department of the Aluminum Co. of America, Pittsburgh. The series is planned to cover 75 basic American industries.

The text covers a definition of aluminum, history of the industry, mining, production of alumina, reduction of aluminum, semifabrication of aluminum, manufacture of finished products and marketing.

A feature is a list of occupations in the aluminum industry, which assists in finding information about the several jobs that make up the industry.

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VIBRATION-PROOF *fastening*

CANTILEVER type spring assembly and a stud comprise the war-designed locking fastener manufactured by Lion Fastener Inc., Honeoye, N. Y. Capable of being applied to removable plywood, metal or plastic strips, channels, housings or panels, it is a preassembled unit which has exceptional tensile strength and shearing resistance.

The spring assembly is composed of spring and base, the base forming a supporting member for the spring under extreme loads. Retaining lugs at each end of the base hold the spring, which is of floating leaf construction. Spring is formed with a double set of grooves and cams which interlock with the notched shoulders of the stud, shown in Fig. 1.

Locking of the fastener is a simple procedure; the pieces with stud and spring assembly installed are brought together and the stud inserted in the spring assembly. A quarter turn of the stud head, which may be of round, flush or wing type, locks the two pieces together, as shown in Fig. 2. Forged shoulders of the stud are rigidly held by the double set of grooves and cams and by constant tensional resistance of the spring.

The base will support the center section of the spring under excessively heavy tension or shear loads, limiting deflection and preventing loss of spring tension. Separation distance between outer sheet and structure also is limited. The spring automatically corrects misalignment during fastening.

Advantages claimed for this fastening device are that it has no threads to strip, no loose parts and that installation time is short as there are only two parts to be spot welded or riveted in place. Locking and unlocking can be done from one side only and tests have proved them to be labor saving.

Laboratory tests conducted by aircraft manufacturers and testing laboratories have found these fasteners to have physical properties in excess of Army and Navy aircraft specifications. The No. 5 Lion fastener has a tensile strength of 1425 lb and a shearing resistance of 1950 lb. Sheet separation when it was subjected to a load of 500 lb was found to be 0.040-in.

Vibration tests of 3600 cycles at 1/16-in. amplitude with a 175 lb load for 25 hours failed to loosen the lock which also was opened and closed 40,000 times at 100 times per minute without sign of appreciable wear. The initial tension of the cantilever spring is from 55 to 65 lb.

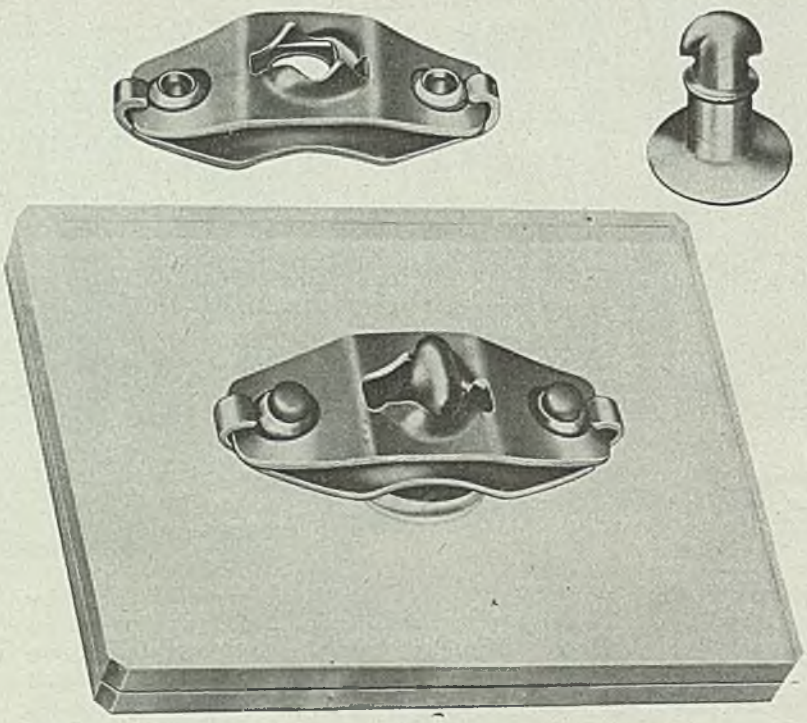

Fig. 1 (top)—Two parts of Lion locking fastener, spring assembly and stud. Cantilever type spring is held in place by lugs on base

Fig. 2 (bottom)—Locked fastener. Stud is inserted in spring assembly in position shown in Fig. 1 and given one-quarter turn to lock. Grooves and cams of spring assembly interlock with notched shoulders of stud

Flow Rates Measured By Electronic Device

Designed for use with a Rotameter, a new Rota-tronic transmitting instrument developed by Fischer & Porter Co., Hatboro, Pa., records and controls miniature flow rates encountered in laboratory or pilot plant operations. Device is said to indicate and record drop by drop flows as small as 5 milliliters of liquid and 20 milliliters of gas per minute at 70° F.

Utilizing an impedance bridge for transmitting flow readings the instrument detects Rotameter float position and amplifies minute electric current to produce sufficient power at recorder pen. Indicator pointer or pen arm can traverse entire scale from zero to maximum flow in 3 sec, it is said. Cost and space requirements are reduced by absence of any slide wire arrangement.

Steam Cleaning with Alkaline-Type Detergent

New heavy-duty alkaline type detergent for use in steam guns and coil-type steam generating mechanisms was placed on the market recently by Oakite Products Inc., 34 East Thames street, New York. Designed for steam cleaning action at low concentrations the new product, known as composition No. 92, is said to prevent scale clogs in steam coils, dissolve readily in hot water, and free rinse surfaces. According to the manufacturer, compound is extremely effective on heavy mineral greases and asphaltic soils found on highway, oil field and refinery equipment, and when overhauling motors.

While concentrations of the gray-white powdered material may be used at 8 oz per gallon or higher, ordinary range on light to heavy-duty cleaning requires only ⅛ to 2 oz per gallon. For stripping certain types of paint, 3 to 4 oz per gallon is sufficient.

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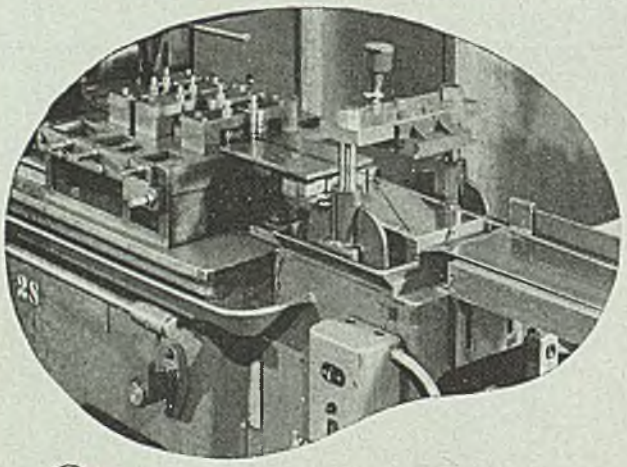

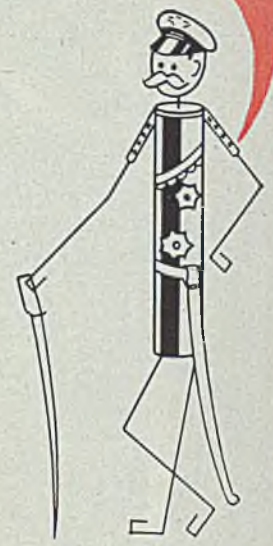

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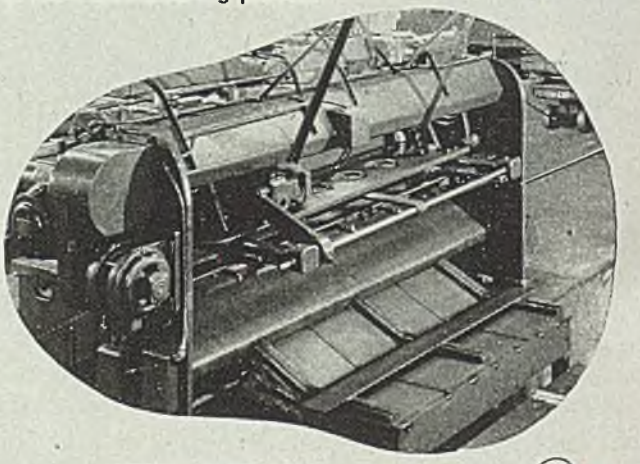

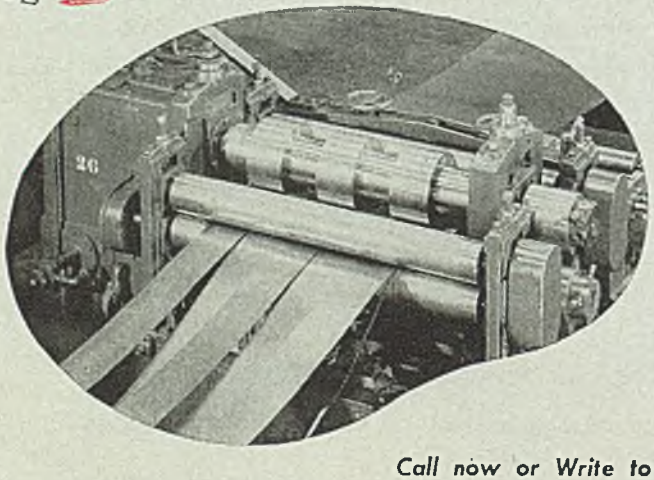

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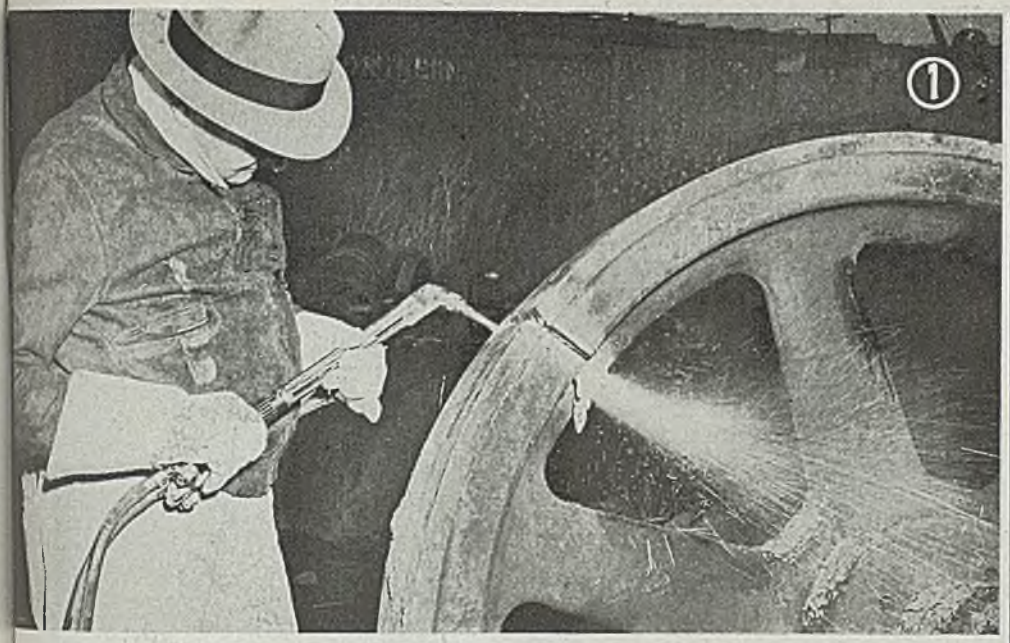
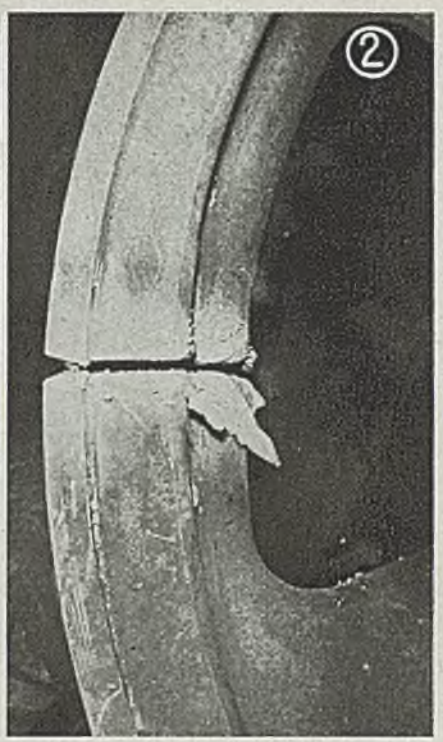




Economical Method of

Flame-Cutting Cast Iron

Fig. 1—Flame cutting large cast iron wheel with oxyacetylene torch

Fig. 2—Close-up showing slag and molten metal which flowed from kerf during cutting

Fig. 3—Diagram of path to be followed with cutting tip for best results. This is moved in an arcurate semicircular path, constantly moving downward

Fig. 4—Drawing at left shows position of cutting tip to start cut. As cut is started, position is gradually changed until angle of 75° is reached, cut on under side of plate preceding tip on top

ECONOMICAL, successful cutting of cast iron is now possible with improvement in equipment and techniques recently announced. Heretofore, excess carbon and impurities contained in cast iron made oxyacetylene cutting of this material almost impossible as operation was too slow and costly to be of any commercial value, even with established methods and apparatus.

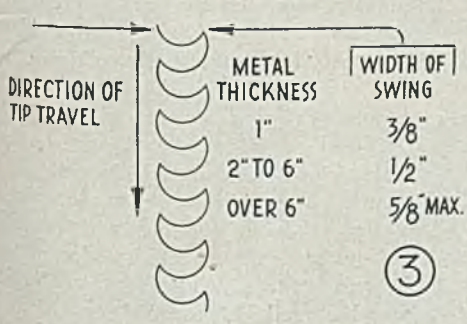
As conceived by engineers of National Cylinder Gas Co., several cardinal principles are to be considered before flame cutting cast iron: Equipment must be capable of carrying required volume of gases; suitable oxygen and acetylene pressure has to be maintained; thorough preheat conditions must be kept; operator should wear suitable clothing to furnish adequate protection from heat and slag; and operator has to know most advantageous cutting positions for various types of cutting problems.

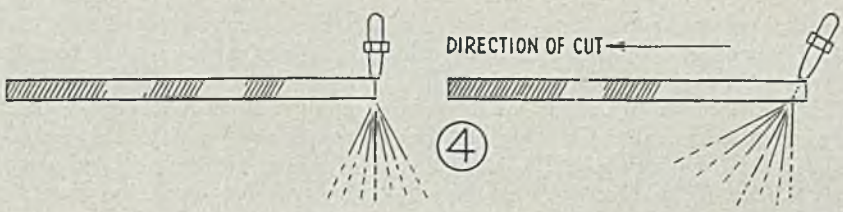
Cutting of cast iron requires cutting tip of same size used for cutting mild steel of equal thickness. Oxygen pressure also should be the same as used in cutting mild steel of same thickness. Variations with different types of equipment make determination of exact acetylene pressure difficult, but most satisfactory pressure is determined by maximum preheat flame that will remain on tip after a neutral flame has been established. Acetylene pressure, never to exceed 15 psi on gage of acetylene regulator, must be maintained during actual cutting time.

Single cylinders should never be used on extremely heavy sections as single cylinders do not produce a sufficient volume of gas necessitating a new source of supply such as a piped installation or several cylinders manifolded together. Degree of preheating depends upon grade of casting—softer casting requires less preheat, harder grades, certain alloys and castings exposed to service in heat require a higher degree of preheat. Most satisfactory preheating is by torch, acetylene being preferred as success of cut depends upon ability to maintain a constant maximum preheat temperature.

Heat-resistant gloves, form-fitting goggles, and other standard protective devices are worn by operator at all times as he is subjected to intense heat and molten slag. As a word of caution, welding spectacles are not satisfactory and should not be used in cutting cast iron.

Actual cutting operation is guided by thickness and shape of casting to be cut. Thick castings should be preheated to a bright red glow in a strip 1 in. wide across narrowest dimension or top of casting and for about 4 in. across other dimension, resulting area not being





TRUCK DISPATCHING
by Intercommunication System

AT the two-section, several acre plant of Spicer Mfg. Co., Toledo, O., an intercommunication system is solving the intra-plant transportation problem. System consists of strategically located substations connected by means of equipment furnished by Executone Inc., 415 Lexington avenue, New York, to central dispatch office.

A large manufacturer of universal joints, transmissions, clutches and other automobile parts, Spicer uses many power-driven trucks to convey material from one part of the plant to another. Blind dispatching made it impossible for dispatchers to know where trucks were at all times. Some departments were waiting for material while others were glutted with finished products to be removed. Quick communication between operators of roving trucks and dispatch office located at some central point was imperative.

This is now accomplished by an internal trucking department composed of two separate control systems, one for each section of the plant. Two control stations are in contact with 17 substations, eight in one section of the plant, and nine in the other. A large wooden control chart or map of the plant, with holes to represent substations in various departments, is located in the dispatch office. By using pegs with numbers corresponding to those on the trucks, dispatchers as shown in view below can place pegs in proper holes and know where trucks are, or should be, at any specified time.

When a job is completed, truck operator goes to nearest substation and calls dispatcher through the intercommunication system as in illustration at right. Truck then can be dispatched quickly to the nearest department needing service.

---

too great to allow cooling before cutting. Cutting begins in a downward direction with tip moving in a semicircular path in preheated area, dropping a little with each stroke, as shown in Fig. 3.

Cutting can be done in any position but it has been found best to start at top of casting with tip in horizontal position to allow burned slag and much of heat to dissipate to side of casting away from operator and prevent accumulation of molten slag in kerf. This procedure also gives cutter better view of opposite end of kerf.

Retaining sufficient heat for continuous cutting of cast iron sections less than 2 in. thick is difficult, making necessary a method of operation somewhat different from that used with heavier castings. Technique varies with shape, width and thickness.

Plates under 1 in. thick are cut through widest dimension from narrowest edge, cutting through wide dimension only when plate is extremely wide and has been cut from both edges. This method is satisfactory as slag disposition is not such a problem as on large thick castings.

Castings between 1 and 2 in. thick are preheated for 6 in. or more, cutting starting in a vertical position and slowly changed to a 75 degree angle, with forward part of cut on underside of plate, as shown in Fig. 4.

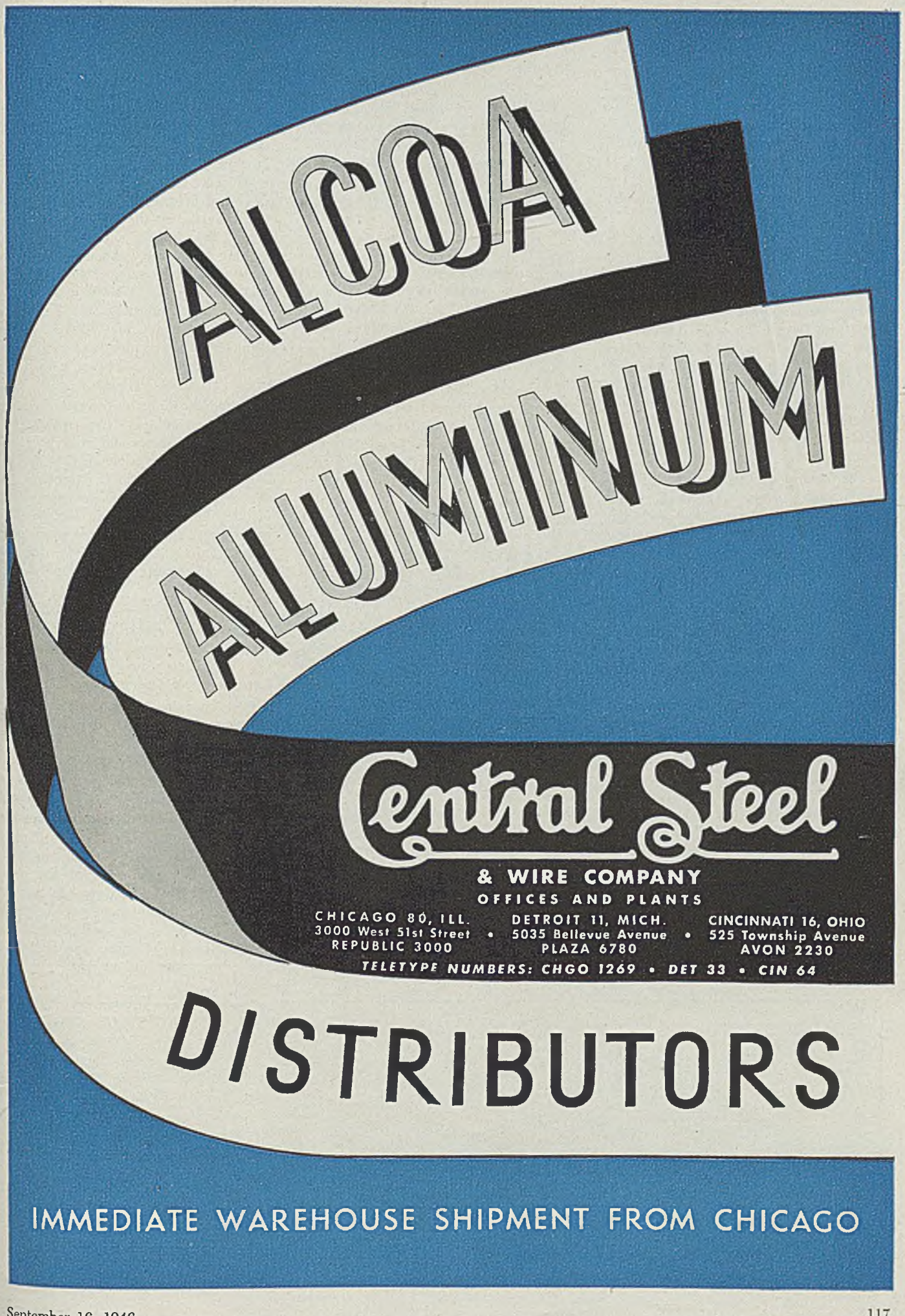
Hollow cast iron shafts are best cut by starting at bottom after preheating and working in an upward direction until hollow is reached. This procedure protects operator from intense heat and molten slag which has a tendency to lodge in hollow. In cases where location prevents starting at bottom, starting on side is next best. Cutting should be to the hollow, or center, not at an angle.

Cast iron pipes, although similar to shafts, have a relatively thin wall and therefore require a different procedure. As there is no slag disposition problem, cut is started at surface after a strip along line to be cut has been heated to a bright red color. Tip should be held to cut a 75 degree angle as was done on plates of 1 in. thickness.

When preparing heavy cast sections for welding, especially when bronze is to be used, break is usually satisfactorily "veed" out by chipping, but when chipping equipment is not available, the oxyacetylene cutting torch may be used, but requires cleansing by sand blasting or grinding before welding.

It is also possible to cut holes and slots in castings, although it is an operation requiring great care to prevent shrinkage fractures. Success or failure depends upon location of hole or slot. Entire castings should be preheated for full expansion before cutting and then cooled slowly and uniformly.

It is pointed out by National Cylinder Gas Co. engineers that demolition work is often more economical in preparing castings for cupola charging sizes than is oxyacetylene cutting. Demolition consists of dropping a heavy steel ball supported by a crane over castings. This method is not always available or castings are not always located near demolition equipment. However, flame cutting can be used with demolition work for cutting castings into smaller pieces for removal to a point when crane using drop-ball method is available.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Machining Crankshafts

(*Concluded from Page 94*)

must be made to specifications that permit machining qualities and still have proper hardness conformities. The steel used for the crankshafts is carbon 1042, which has a required rockwell hardness of 60 to 62 C scale reading. Prior to standardizing on the above steel, exhaustive experiments were made on others, particularly carbon 1045.

First of the nineteen operations is stress relieving the forged crankshafts at a temperature of 900° F, as seen in Fig. 1. The second operation is done on a 6-spindle semiautomatic chucking machine. On it are turned the main bearing and rotor journal. It also faces thrust shoulders and one end, center drills one end, undercuts for grinding and drills a 1 in. hole for tapping. Bearing plates and pistons also are machined on this equipment, the former shown during processing in Fig. 2.

The next operation consists of box turning the bearing, facing shoulder and end, undercutting for grinding and centerdrilling. This is done on a hand screw machine. Operation No. 4 machines the locating lug for subsequent turning and grinding operations of pin bearings.

A specially built LeBlonde lathe, shown in Fig. 3, machines the pin bearings of the crankshaft. The part is located on the main bearings and clamped tightly against the previously machined locating lug with tools contacting the work both front and rear at the same time to prevent distortion of the shaft. After one pin bearing is machined the fixture is indexed 180 degrees and the same process is followed in machining the second pin bearing. This operation gives definite assurance that the pin bearings are machined 180 degrees apart.

Sixth in the order of operations is the drilling of the oil passage hole to a depth of 6 15/32 in., four shafts at a time on a special deep hole drilling machine, shown in Fig. 4. The machine is so constructed and electrically timed that the drills automatically clear themselves before chip loading can cause drill breakage. The depth of this drilling before clearance varies with the total depth of the hole.

Small holes are drilled from the periphery of the shaft at all bearing surfaces into the center passage oil hole to permit the oil pump to force oil into all bearings in operation. Operation No. 8 machines the double oil groove on both main bearings, while No. 9 taps a 5/16-in.—18 hole for clamping the motor rotor on the shaft. All machined surfaces are burred, chamfered. All sharp edges removed to prevent cracking in the hardening operation. The shaft is thoroughly cleaned in the tenth operation.

Induction Hardening Process

In operation No. 11, all bearings on the shaft are hardened by the induction hardening process on Tocco equipment manufactured by Ohio Crankshaft Co., and shown in Fig. 5. Equipment consists of induction hardening equipment with three hardening stations. Bearing to be hardened is suspended in a copper induction block by placing the shaft between centers. The high cycle current is applied by the operator pressing a button, and the shaft is brought up to the proper temperature. Allowed to stand from 1 to 2 sec, the time depending on the material, bearing size, etc., it is then sprayed with water at a given pressure and removed from the fixture. Hardness obtained is 60 to 62 measured on a rockwell C scale, as stated previously.

In the twelfth operation the shafts are placed in an electrically controlled hot air furnace for a period of 1½ hours to relieve heat treat strains and prevent cracking. Operation No. 13 consists of lapping of centers with a diamond impregnated carboloy tool to prepare them for accurate grinding operations to follow.

In the next operation the motor rotor journal is ground to a 0.0005-in. limit. Main bearings are held to the same tolerance on an intermediate finish operation. The thrust face is also ground in this operation.

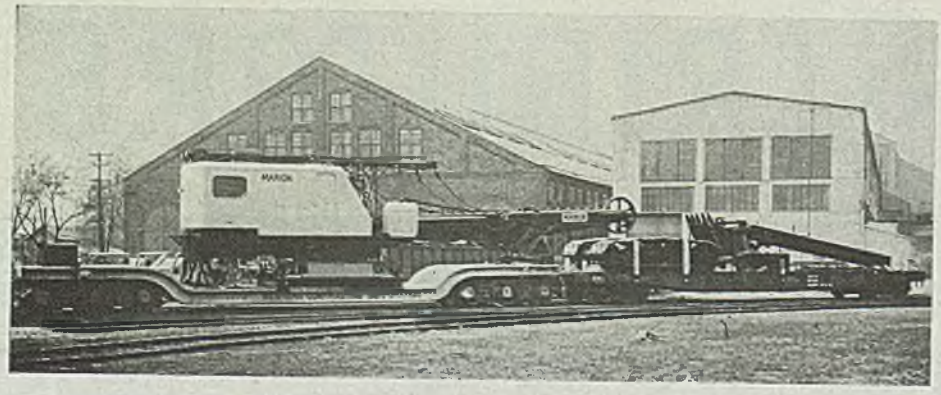
The pin bearings are ground on a special pin bearing grinder, both heads of which are driven by a synchronized set of chain drives. In the fifteenth operation, the operator places the shaft in a special index fixture locating on the main bearings and against the previously machined locating lug. After grinding one pin bearing the fixture is then indexed 180 degrees and the other pin bearing is ground without removing the shaft from the fixture. This is done to make certain the throws will be 180 degrees apart. Bearings are held to a maximum tolerance of 0.0005-in. on the diameter. The eccentricity of each throw bearing dimension is held to a tolerance of plus or minus 0.001-in.

In operation No. 16, the main bearings are finish ground to a tolerance of 0.0005-in. on the diameter and must be round within a maximum tolerance of 0.0003-in. Air gages are used in the inspection of the outside and inside diameter on all circular forms, as seen in Fig. 7. The next operation, No. 17, removes all sharp edges left by grinding to prevent scratching of mating parts in the assembly operation.

All bearing surfaces are lapped simultaneously on a specially built crankshaft lapping machine, and all bearing surfaces are finished to a maximum of 5 microinches in the eighteenth operation.

Last operation consists of thoroughly cleaning the shaft and delivering it to skilled bench inspector who checks all dimensions 100 per cent with precision gaging equipment, as seen in Fig. 6.

Special handling equipment is provided for handling crankshafts throughout the machining operations to prevent damage to finished surfaces. Many hours were spent by the supervision of the compressor department of Servel in training operators for this intricate machinery and perfecting tools, jigs and fixtures to provide the final finished product in the desired quantity and quality.



SHIPPING HUGE SHOVEL: New heavy duty 3½-4-cu yd diesel machine designed by Marion Power Shovel Co., Marion, O., for service in mining, quarrying, stripping and general construction, is shown here ready for rail shipment. Designated type 111-M, the all-welded machine is easily convertible to dragline or clamshell service, and as can be seen, requires no major dismantling for shipping by rail

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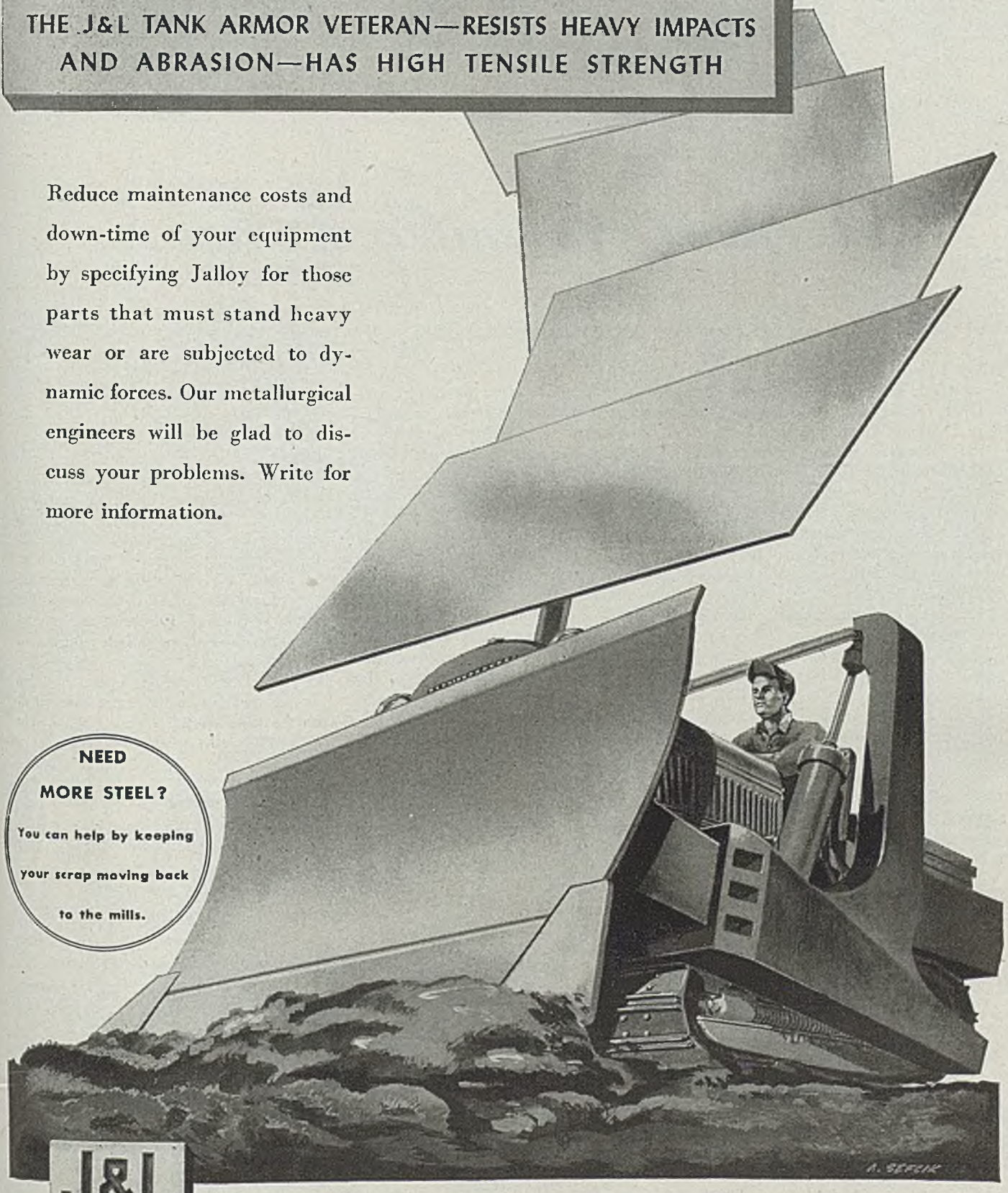

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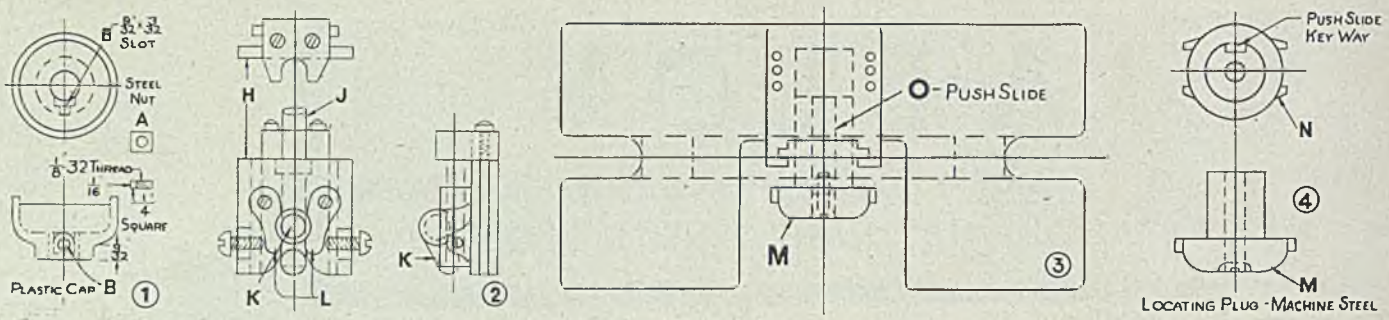


Novel Assembly Fixture

By ROBERT MAWSON

A PRODUCTION job consisted of placing a small threaded nut in the molded slot of a plastic cap and then assembling a screw into the tapped hole in the nut. A detail of this plastic cap is shown in Fig. 1, the nut A fitting in the slot B.

First attempted by hand, this means of operation was found to be out of the question because often there is a flash left from the molding operation and the nut had to remove this flash by being forced into the slot by hand. With the nut being only ¼-in. square, the job was difficult and costly.

To do this operation mechanically and at a low production cost, the fixture here illustrated and described was made and placed in service.

This fixture (Fig. 6) is made with a base C which is located by means of tongues and held in position on the table of a power driven screw driving machine. A vertical column D is located and fastened to the base by means of screws and dowels. The upper portion of the column is machined to suit the screw driver guide slide, shown in Fig. 2.

On this slide is attached a novel arrangement for adjusting the screw driver J which is used in the assembling operation. Referring to Fig. 2, two small lever cams L can be seen fastened to the plate H, which can be moved sidewise. As the inner faces of the cams are in contact with the screw driver this may be adjusted for position by moving the lever cams in or out by means of the screws.

Another feature is the chute K which guides the screws, when placed in this device, into the hole B in the plastic cap. In the column is located the plug, the head of which is made to be the same contour as the inside surface of the plastic cap. The projections N on the outer surface of the head locate the cap correctly by coming against the edges of the projection on the part.

A push slide O, seen in Fig. 3, is made to be a sliding fit in the key way of the locating plug, this slide coming to about ¼-in. from the outer end of the plug. The other details consist of the lever P and the pusher Q, the general design of these elements being illustrated in Fig. 5.

To use the fixture, the operator places one of the nuts in the space marked R on the front elevation view, Fig. 6. He

(*Please turn to Page* 149)

Fig. 1—Drawing of plastic cap to be assembled. Nut A is to be assembled in slot B

Fig. 2—Screw-driven guide slide

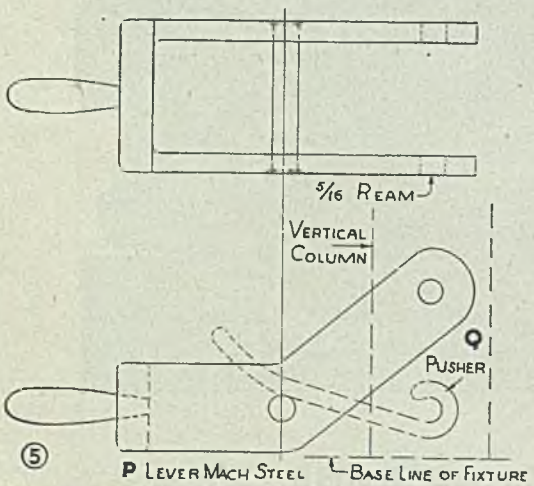
Fig. 3—Plan view of fixture

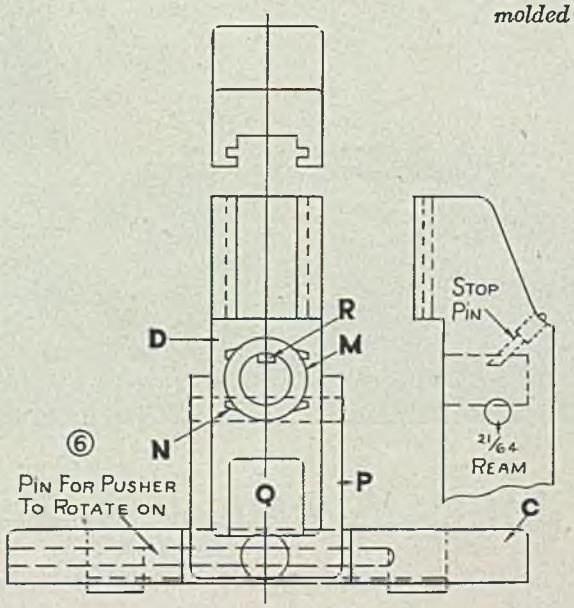
Fig. 4—Locating plug on fixture

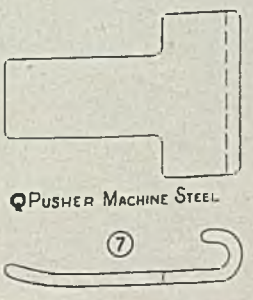
Fig. 5—Raising of lever P moves pusher Q against cap, forcing it back to face of column, bringing push slide in key way against stop pin and pushing nut into molded slot in cap

Fig. 6—Front and side elevation drawings of assembly fixture

Fig. 7—Diagram of pusher Q, made of machine steel







Modifying BORING TOOLS

Correct boring bars and cutters used with standard machines handle design changes of machined parts

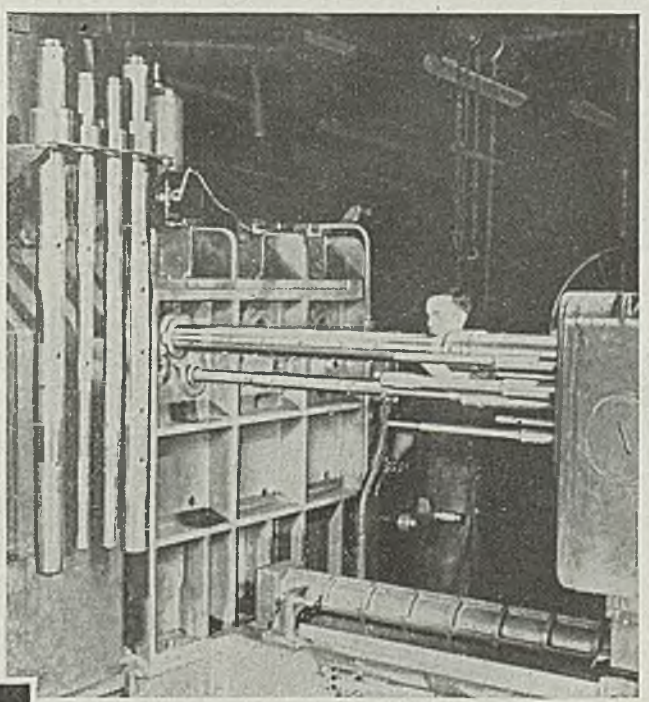
WHEN changes are made in the design of machined parts it is often necessary and desirable to modify boring bars and cutters rather than the machine. Special boring units, turret lathes, horizontal boring machines and similar machine tools are readily adapted to specific work when correctly designed boring bars are used.

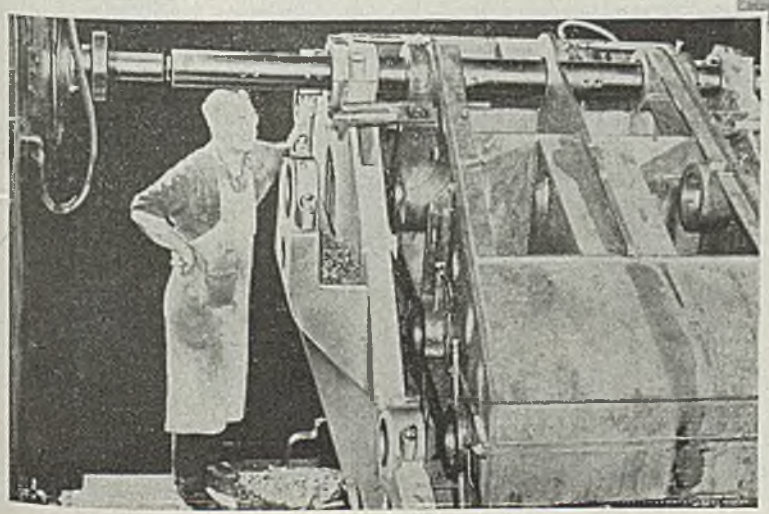
By taking full advantage of various standard and special boring bars it has been the experience of Davis Boring Tool Division of Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., that machines on hand can be used to perform work which has been changed in design.

Soft bars may be used for occasional boring jobs where production does not warrant more expensive bars. Heat treated bars can be obtained for boring operations where cutting loads are heavy and a bar with high physical properties is needed. Carburized and hardened bars are recommended for boring which requires resistance to wear for high production.

When unusual or complex boring operations must be accomplished on various types of horizontal boring equipment, it is often possible to use specially designed boring bars. Such bars may be equipped with expanding and retracting type cutters, depending upon the operation. One of the most important uses for such bars and cutters is for boring large engine blocks. In addition to this type of work, bars with block type tools may be used for internal grooving, recessing, counterboring and chamfering.

Multiple boring cuts may be performed simultaneously by using stub boring bars equipped with expanding block cutters. Instead of relying on single point boring tools to rough, semi-finish and finish bore in three passes, special bars with expanding blocks properly spaced complete the bore in a single pass. This type features simplicity of setup. Expanding blocks may be adjusted quickly to bore diameters. When cutters become dull, the complete block is removed and cutters are ground in the block. Block is then replaced with minimum handling and adjusting.





Above—Special boring bars are shown ready to finish bore crankshaft and cam bearings. Three sets of bars are used for three engine block sizes

Left—Precision boring operation on a turntable using block-type cutters in a line bar. Simple cutter adjustment reduces setup time

Hot-Dip Galvanizing Practice

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

TWO of the largest sources of loss in galvanizing are the accumulation of oxides on the surface of the molten zinc and the heat radiation from the top of the metal.

Oxides are readily formed on the surface of all molten metals exposed to the air. The surface of the metal may be skimmed clean but instantly there forms a film of oxide which grows steadily, rapidly, and continuously as long as the metal remains molten.

These oxides contain approximately 70 per cent zinc. Because of the difficulty of converting this oxide of zinc into a useful product, however, only a small percentage of the initial cost of the zinc as prime metal can be recovered.

Galvanizing processes for such commodities as pipe and wire, on a single installation, incur a loss of many thousands of dollars per year due to the heretofore impossibility of preventing oxidation of the zinc.

As a specific case of loss due to zinc oxidization consider a standard straight wire kettle. The wire enters the galvanizing kettle at one end and makes its exit from the other. The zinc at the entrance is protected from oxidization by the volatile cover formed by the action of the No. 20 neutral flux wash, but the other portion of the bath surface is exposed to accumulate oxides from one drossing to another.

The seriousness of this loss may be reckoned from the following statistics of a standard straight wire installation.

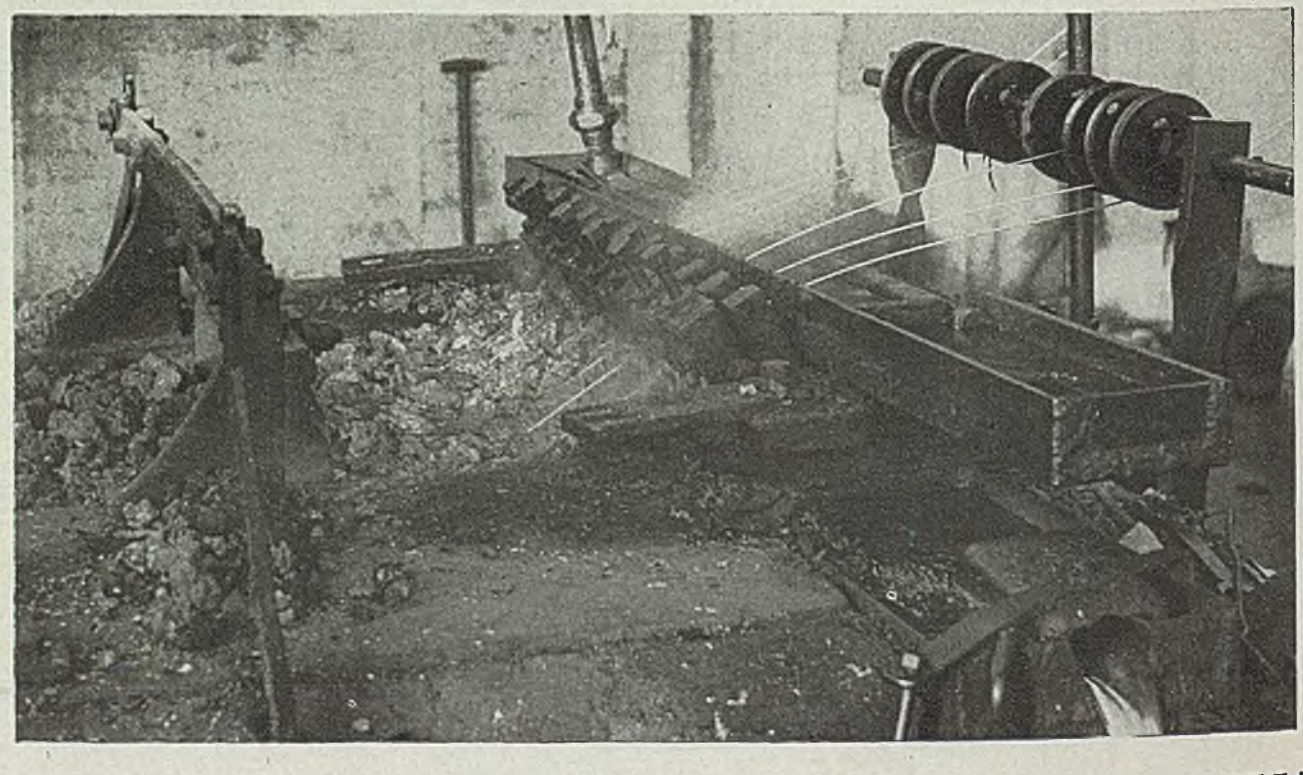
With an exposed surface area of approximately 6 sq ft this installation accumulated 102,792 lb of zinc oxide in a year's operation. About 70 per cent of this accumulation represented zinc, which, at the market price was equivalent to a loss of approximately $5000.

The loss at this plant totaled nearly 10 per cent of the new zinc used and when it is considered that over 41,000 net tons of zinc is used annually in the wire industry, the enormity of this loss in this country is at once apparent.

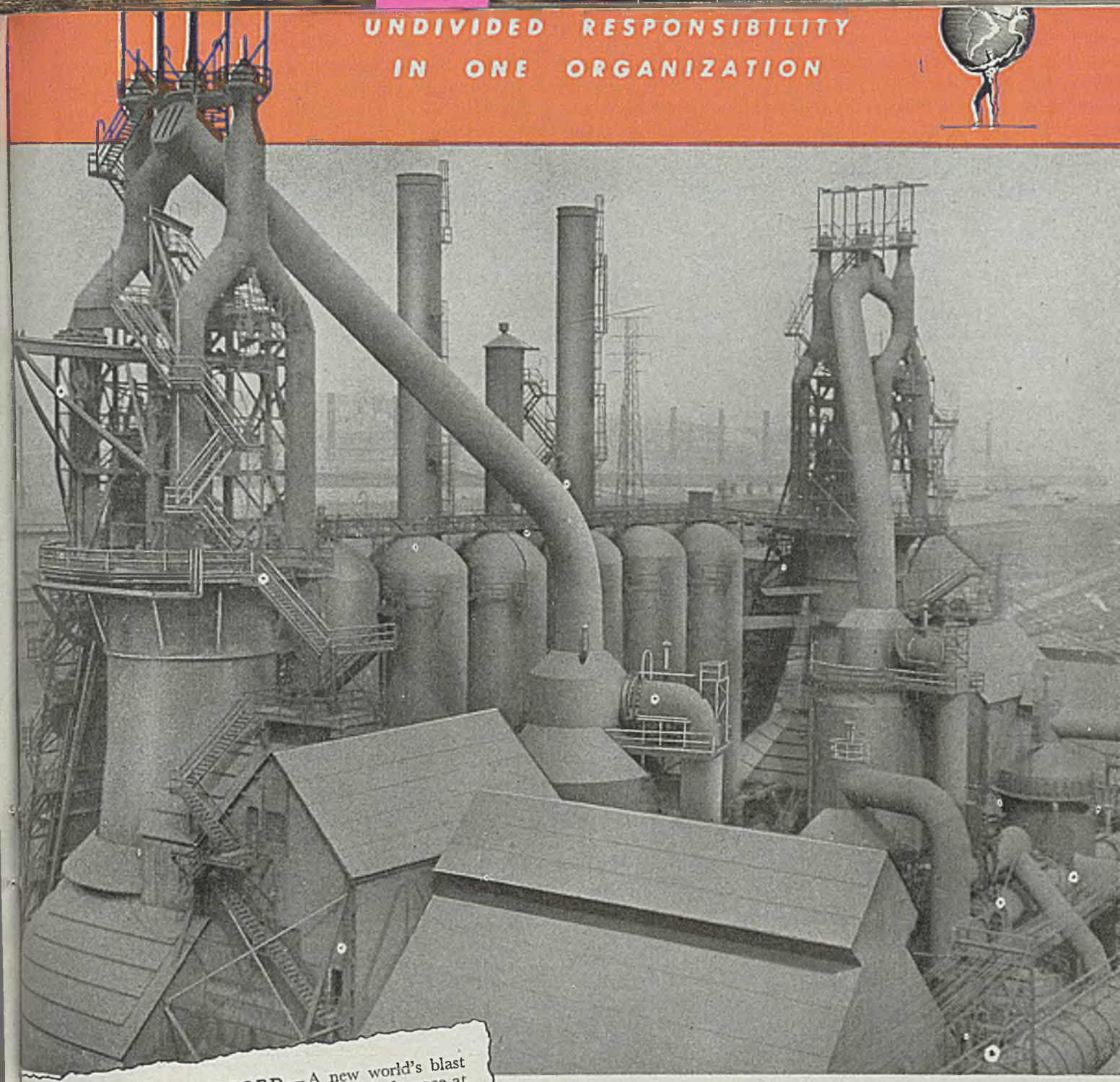
With a standard pipe installation, however, the loss is still larger. Usually a pipe or tube kettle is divided lengthwise by a dam and the pipe is fed into the kettle sidewise. On the entrance side of the dam lays a blanket of volatile flux which effectively prevents oxidization. But the outgo half is exposed and free to accumulate oxides.

The exposed surface area on this pipe kettle is approximately 36 sq ft and yet it manufactured 1,443,552 lb of zinc skimmings in a year which is a gross

Fig. 22—Exit end of wire galvanizing kettle. Growth of zinc oxides may be seen on surface of this antiquated installation



UNDIVIDED RESPONSIBILITY
IN ONE ORGANIZATION



BLAST FURNACE RECORD—A new world's blast furnace record was made in July by the No. 2 blast furnace at the Edgar Thomson Works of Carnegie-Illinois Steel Corp., with a production for the month of 50,590 tons. The previous record was held by Great Lakes Steel Corp., which has a furnace that produced 49,705 tons in 1943. The new record is more unusual because it was made without scrap charges, according to the company. In making the new monthly record, the furnace set two new weekly records and a daily record. The best weekly record was for the week ending July 26, when 12,189 tons of pig iron were produced and the best daily record was made on July 12, when the output totaled 1976 tons or 48 pct over the 1330 ton rated capacity of the unit. The monthly production was 23 pct over the rated capacity of the furnace.

REPRINTED FROM IRON AGE, AUG. 9, 1945

THE photograph reproduced above shows the No. 1 and No. 2 blast furnaces at the Edgar Thomson Works of Carnegie-Illinois Steel Corporation. These furnaces were designed and constructed during the war by Arthur G. McKee & Company. The record referred to in the clipping was made by the No. 2 furnace shown at left.

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NEW YORK, N. Y.

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★ *Engineers and Contractors* ★
2300 CHESTER AVENUE · CLEVELAND, OHIO

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loss of over 25 per cent of the new zinc used. And when it is realized that over 54,000 net tons of new zinc is used annually in this country for galvanizing pipe the enormity of this loss becomes apparent as well as that of the 2400 or more galvanizing installations in this country which are allowed to stand at night, over weekends and shutdown periods to accumulate their quota of this costly residuum.

If a blanket were to be perfected to prevent this loss in oxides it should also operate successfully in forbidding the loss by radiation of the heat now escaping from the surface of the metal.

To accomplish both of these purposes, namely, the elimination of oxide formation and the prevention of the loss of heat by radiation, the blanketing material must be capable of remaining on the surface of the molten zinc held between 820 and 900° F and still not burn, char, flash, melt or cake. Preferably it should form, upon contact with the zinc, a layer of inert gas; it should be of such a nature as to efficintly insulate the heat; and lastly, it must be easily applied and removed for repeated use.

These specifications appeared to be utterly impossible to meet but eventually after different materials were studied and combinations tested a material designated G.B. 412 was accepted.

This material is granular in appearance and upon application to the zinc surface remains in its original form. It will not burn, char, flash, melt or cake and is easily applied and removed.

Upon contact with the zinc this material forms a blanket of inert gas over the entire surface of the zinc thus effectively preventing its contact with the air and the formation of any oxide.

Because of its insulating properties, savings in heat lost through radiation have been reported between 35 and 50 per cent with a blanket varying from ½ to 1 in. thick.

The technique to be followed accurately in the use of this blanket is as follows:

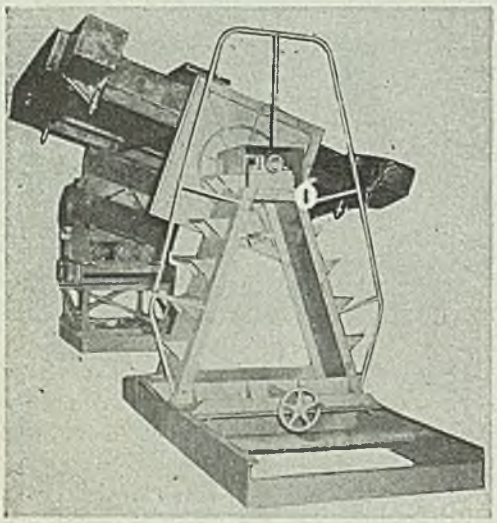
1. Using a skimming tool start at one end of the kettle and skim the surface of metal free from oxides.
2. Immediately following the skimming tool and before any oxidization takes place, spread the blanketing material on the surface to the desired depth. Application thus follows the skimming tool over the entire surface to be covered.

So effective is this material in blanketing the heat that the operator is warned to watch carefully the temperature of the bath at the time of first application to obviate the possibility of excessive temperature. In some instances even pilot burners have been found to be of too great a capacity.

(To be continued)

Positioning LARGE WELDMENTS

ADVANCEMENT of welded fabrication has been rapid in the last few years and with this advance has come the problem of economical handling and positioning of large weldments.

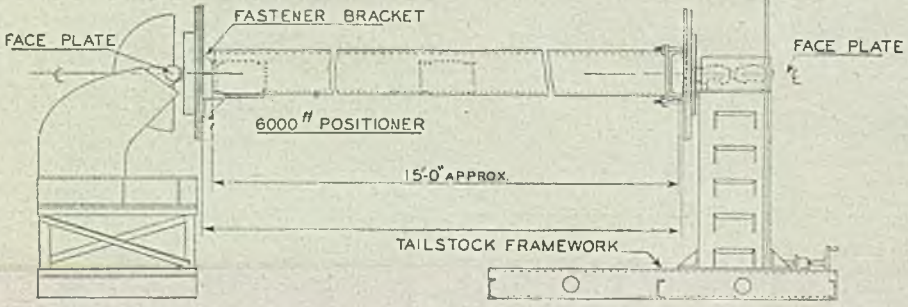


The uses of positioning fixtures are limited only by the ingenuity of the designer and welding operator. The Chain Belt Co., Milwaukee, saw the need for a special fixture to position large weldments. A setup was built using a standard 6000-lb capacity positioner, electrically driven, and set on a fabricated adapter frame worked in conjunction with a tailstock, as seen in the illustrations.

As shown in Fig. 1, the tailstock is constructed almost entirely of welded fabrication and consists of a base framework with machined surface runners and an A-frame pedestal with machined base runners. A heavy cross clamp holds these two component parts together. Setting the unit to close measurements is accomplished by a built-in adjusting screw.

Fig. 1 (left)—Weldment positioning fixture by Chain Belt Co. A-Frame tailstock is in foreground and positioner in background. Tailstock permits different lengths to be rotated for downhand welding

Fig. 2 (below)—Diagram showing standard 6000-lb positioner used with adjustable tailstock



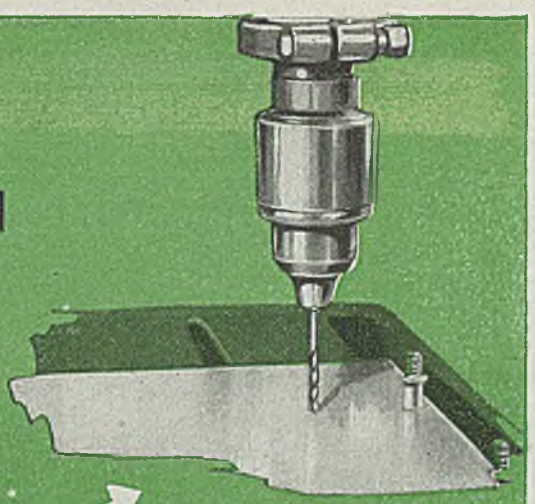
The A-frame carries a face plate with shaft, bearings, etc., aligned with the face plate on the positioner. Face pads and solid anchor tubes are set into the floor to tie down the tailstock unit. For use in welding products of extreme differences in length, the entire frame work of the tailstock is shifted to the proper anchor points and locked in place. The aforementioned handwheel adjusting screw makes the final adjustments.

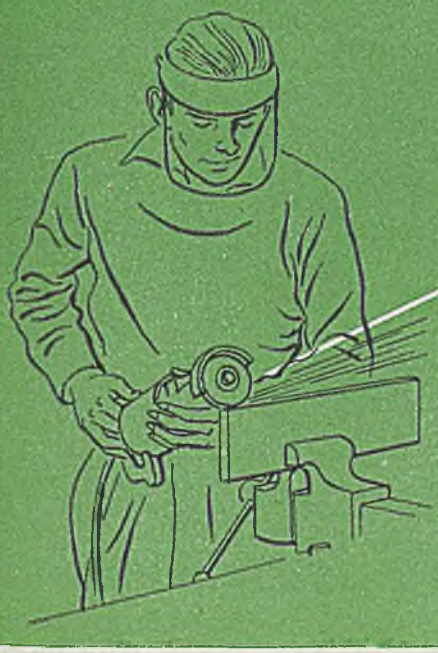
The tailstock of the positioner has steps up the side of the A-frame as well as a guide rail to assist the operator in mounting the weldment. Adapter brackets are fastened to the face plate on the positioner and tailstock, as shown in Fig. 2. Various adapters were made to fasten the parts to the face plates in line and in the same square plane. Weldment designs call for sections varying in width from 2 ft 10 in. to 10 ft 10 in. and in lengths up to 15 ft. The standard positioner at the opposite end from the tailstock can be used separately when smaller weldments do not require the use of the tailstock.

Awkward to handle products such as frames, hoppers, casings and large buckets in a wide range of sizes are welded in this setup. Results show that in using this design, it is possible to control welding procedure to much better advantage, good results being obtained in lower unit cost with safer handling. The ability to obtain downhand position welds with better uniformity also gives better results.

How magnesium is speeding production

because it's easy to work!





Many a firm goes to magnesium for its unique *lightness* . . . and then chalks up additional boosts in production because it's so *easy to work*. Modern plants that use magnesium find it saves time, labor, and tools through this exceptional workability.

Magnesium is easy to saw, with band and circular saws and also hand and power hack saws. It permits larger cuts per tooth than other structural metals. And it can be worked faster and easier than most metals by hand tools—chipping tools, drills, burrs, chisels, planes, and portable milling cutters.

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LIGHTEST OF ALL STRUCTURAL METALS

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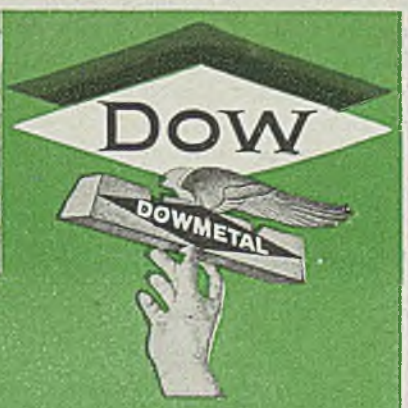
Excellent machinability of magnesium speeds work with hand tools, such as the chipping operation on this magnesium casting.

Sawing magnesium, with low cutting pressures, requires only one-tenth the power that is needed for sawing steel.



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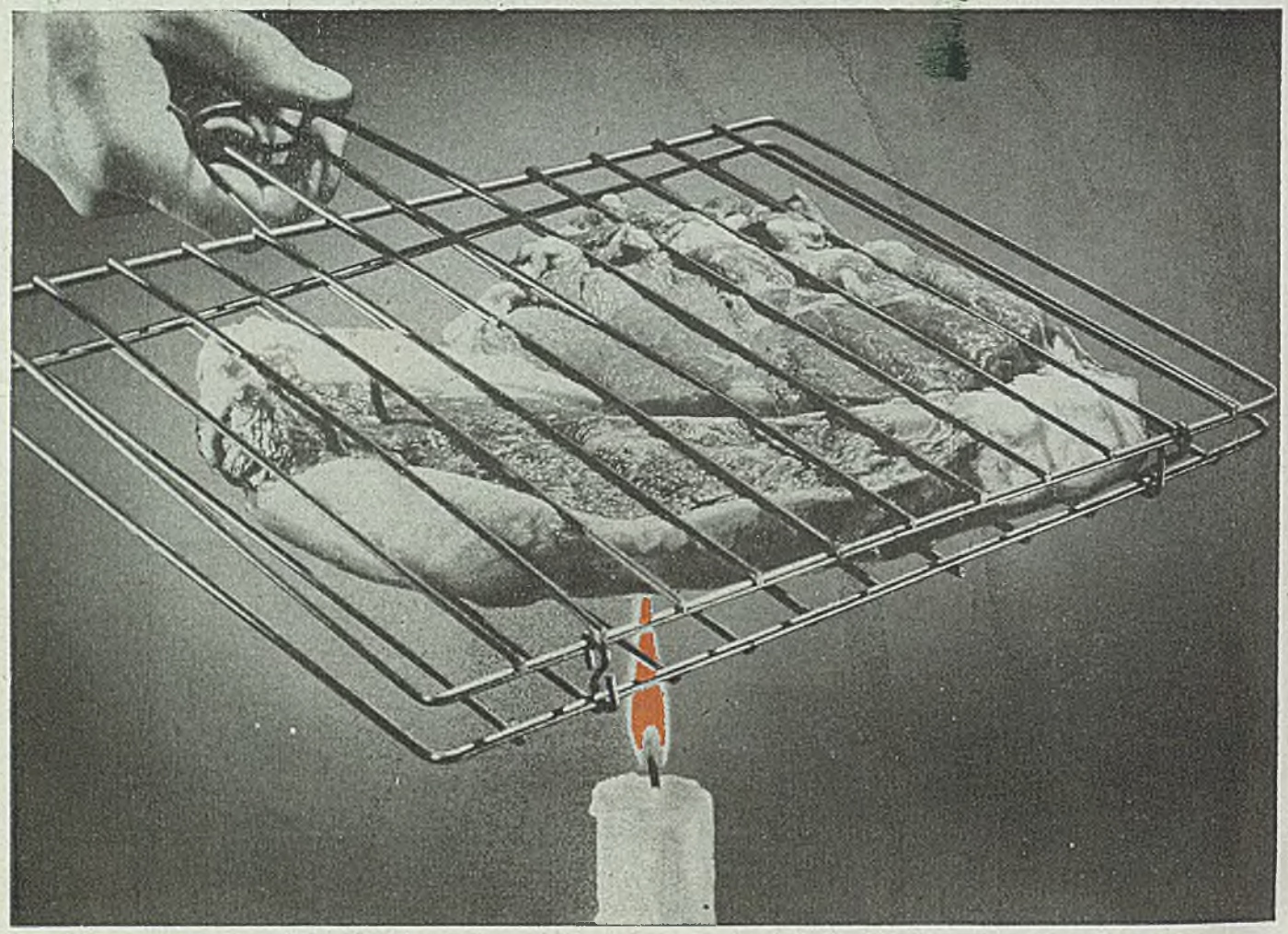

A Candle Won't Broil a Steak

—and neither will inadequate wiring run electrical equipment at FULL CAPACITY

Wire ahead!

IF A MACHINE is running 1500 RPM, and it should run 1800 RPM, don't blame the operator. Chances are that *reduced voltage* is curtailing the machine's production. In fact, inadequate wiring can reduce efficiency as much as 25% to 50%!

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DON'T BE PENNY-WISE AND POWER-FOOLISH

ANACONDA ANACONDA WIRE & CABLE COMPANY

Preserving Artillery

(*Continued from Page* 102)

at ½-hour intervals over a 4-day period. Extreme skin temperatures during the test ranged from 40 to 140°F. Results of the test indicated that, regardless of the 100°F differential temperature obtained on the skin, the metal simulating the gun inside the container remained at practically constant temperature in both containers. On this basis the conclusion was drawn that no insulation was required inside the containers.

Preparatory to painting, all exterior surfaces were prepared by grit blasting and given a treatment of phosphoric and chromic acids.

Specification for the exterior protective coating called for a prime coat of paint, pigmented principally with red lead but modified with some basic lead chromate. Vehicle specified was a full alkyd resin containing no admixed or otherwise uncombined drying oils; an intermediate brown coat pigmented with red lead and iron oxide, vehicle the same as before; a blued aluminum coat with the vehicle similar to the prime coat; and a finish coat of aluminum made up of 2 lb of aluminum paste to 1 gal of liquid, again using the same vehicle used for the prime coat.

Interior surfaces of the containers were not given protective coatings for a twofold reason. First, because of the noncorrosive atmosphere within the container it was deemed unnecessary to provide any protection. Second, it seemed entirely logical to leave the steel surfaces of the container exposed on the inside so that any oxygen which might be present would have a chance of being sequestered by the metal of the container and tend to prevent such oxygen corroding the metal in the artillery.

The leak indicator gage is constructed so it is self-compensating for any changes in pressure due to temperature variations. One of the bellows is subjected internally to the nitrogen pressure present in the pack. The other bellows forms one end of a completely sealed thermostatic system which consists of the bellows, capillary tubing and a bulb. Both bellows are assembled so no movement takes place as long as the pressures in each are the same. If, however, one is subject to a lower pressure than the other, the center section of the bellows assembly will shift toward the low pressure end and, by so doing, will move the hand of the gage, indicating that nitrogen should be added to the pack, or that the gage is faulty and should be replaced.

Thermostatic system of the gage is subjected to the same temperature conditions as the nitrogen in the pack, since it is enclosed within the pack. Before the bulb is sealed it is filled with nitrogen to a pressure corresponding to 6 psi at 70°F. Gage is calibrated so that when a similar pressure of nitrogen is introduced into the pack, the two bellows balance each other and the indicator on the gage moves to the center point. This method indicates the proper amount of nitrogen required to fill the pack to the pressure desired, regardless of the temperature at the time of the filling process.

In the construction of containers, submerged arc machine welding was used whenever possible. All other welding was electric metal arc type, manually performed. The machine type weld was found to be sound and gas-tight. It is, of course, very desirable that wherever manual welding is necessary, the work be manipulated so that welding is done in the flat or horizontal position rather than the vertical or overhead position.

Sheet Metal Boxes Built

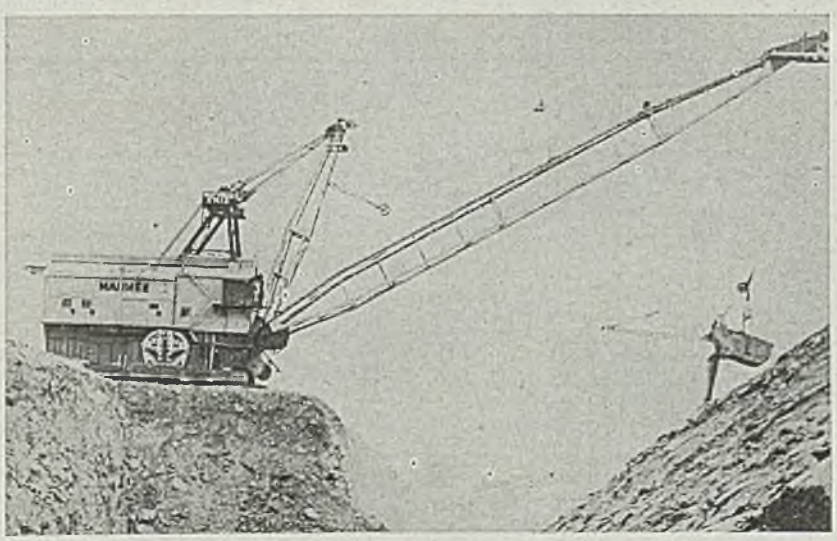
Spare parts and canvas covers were in all cases, with the exception of the 75 mm guns, packaged in sheet metal boxes especially built for the purpose. Boxes were securely strapped to the base plate of the respective containers. It was necessary to protect the spare parts, which are packed in chests, from vibration and shock loads encountered during movement of the containers. Hair felt was found to be satisfactory for this purpose.

No drying of spare parts was deemed necessary as the surface area of these parts is relatively small compared to that of the gun or the pack itself, and the moisture that might be contained on these parts is negligible. The hair felt, however, being of a hygroscopic nature, was dried with the canvas in the drying room. Each spare part was wrapped separately in dried hair felt packing before being placed in the chest.

Before dynamic drying of the container, dried air from the drying units was used to supply 10 psi pressure in the packs for soap testing for leaks. By using dried air for soap testing, packs were partially dried and the dew point lowered to a considerable degree before dynamic drying began.

The containers were dried dynamically by the use of 90 psi compressed air passed through regenerative type silica gel dryers. Compressed air at 70°F in a saturated state was discharged from the drying unit with a dew point of minus 45°F. It was then conducted through heating coils, and the temperature raised to about 165°F. This air then was introduced into the container through the manhole opening by means of a 3-in. flexible metallic hose with an ejector type T section.

By means of the ejector some air was recirculated and some escaped from the manhole opening. Escaping air was sucked into a tube by means of an electrically driven fan and passed through a recording psychrometer. Experiment revealed that when the dew point of the escaping air dropped about 20°, dynamic drying can no longer be continued economically. Data were based upon dry-



BIG SCOOP: Said to be one of the world's largest, this 2,400,000-lb electric dragline excavator at Maumee Collieries Corp., Terre Haute, Ind., has a bucket capacity of 25 cu yd—equivalent to 37 tons of earth and rock overburden. Machine is equipped with General Electric motors and control equipment with total rating of well over 6000 hp. Two motor-generator sets, each driven by a synchronous motor, convert incoming alternating current to direct current for operating dragline constructed by Bucyrus-Erie

ing at a rate of 200 cfm of free air.

Drying rate was determined by use of an electric type integrating and indicating flow meter. The integrating feature on the meter is desirable to determine the end of each cycle when regeneration becomes necessary. At the start of the contract the fire control division of the Ordnance Department, located at Frankford Arsenal, determined from test that no material within a container would be damaged by temperatures up to 165°F. At conclusion of the period of dynamic dehumidification sufficient silica gel was placed in the container to act as a static desiccant and take up residual moisture as this transforms to vapor phase in the finally closed container. Twice as much silica gel as indicated by calculation was used to assure positive protection.

By using this method a positive elimination of oxygen is assured to a final volumetric analysis of 1 per cent or less. It is a positive test because diffusion of gases is not a factor. The air is merely pumped from the pack until an absolute pressure of approximately 1 in. of mercury absolute is achieved. This means about one thirtieth of the original volume of oxygen remains at the end of evacuation. At this time pure dry nitrogen is permitted to enter the evacuated space in the pack. After this is done, the final pressure is allowed to build up to a gage pressure of approximately 6 psi.

It was evident it would not be economical to design all containers of sufficient strength to withstand the external pressure imposed by evacuating to a pressure of about 1 in. Hg absolute. To avoid necessity of so constructing the containers, a decompression chamber 15 ft in diameter, 27 ft long was installed, as shown in Fig. 1.

Two vacuum pumps were installed, one connected directly to the decompression chamber and the other connected through the decompression chamber and, by means of a 2-in. hose, to the container. Pumps connected to the chamber and the container were of such relative capacities as to create a vacuum in each of the vessels in equal amounts. This assured practically uniform external and internal pressure on the gun containers during the process of evacuation. Two mercury manometers were connected, one to the decompression chamber and one to the line from the gun container, to insure equal reductions in pressure and evacuation of the container to 1 in. mercury absolute. With the equipment available, the time of evacuation was 30 min.

Moisture-Free Nitrogen Used

After pressure within the container was reduced to 1 in. mercury absolute or under, the line to the vacuum pump was shut off and, through a tee connection between the shut-off valve and the container, moisture-free nitrogen of 99.998 per cent purity was introduced from a cascade system. Nitrogen was supplied to the system in liquid form, which adds materially to the successful attainment of specified conditions of humidity. Nitrogen supplied in bottles contains considerably more moisture.

At the same time that nitrogen was being introduced into the container, the vacuum in the decompression chamber was broken and air admitted at such rate the two manometers indicated that the external and internal pressures of the container were again held practically equal until atmospheric pressure was reached.

Container then was removed from the decompression chamber. Nitrogen pressure was built up to approximately 6 psi as indicated by the gage. Valve was closed and the connection broken, completing the final sealing of the container. At this point in the process the dew point of the gaseous contents of the container averaged about minus 4°F. The silica gel, which was previously installed, has such relatively large absorbing capacity in relation to the very low moisture content of the gases that within 24 hours the dew point dropped to at least minus 16°F, indicating that the specification calling for not more than 10 per cent relative humidity at 0° C had been met. At this stage of the process gas analysis indicated that the oxygen content of the container amounted to 0.45 per cent.

Most critical requirement for the success of the program would be the ability to produce pressure-tight containers. Leakage tests were conducted using the following methods:

-Bubble testing by spreading over the container compounds in the nature of soap solutions or other solutions forming films having sufficient strength to produce a bubble wherever gases were escaping beneath the film.

Painting a fluorescent penetrating oil on one side of the welded joint and after a period of time examining the other side of the joint under ultraviolet or black light. The penetrating oil is supposed to travel through very minute openings and its presence on the side of the joint opposite to that which is painted is indicated by a fluorescent glow.

An alcohol-burning torch to indicate leakage of Freon from a pressure vessel into which this gas has been injected. When the torch is passed over joints on the outside of the pressure vessel, its flame will be discolored if an appreciable amount of gas is escaping.

The only two tests that appeared sensitive enough for the purpose required were the bubble method and the special torch. The latter test, however, attained a sensitivity equal to the bubble testing only when the containers were supplied with gas in such quantities as to be uneconomical. As a result, the bubble testing method for leaks was adopted in the production program. Theoretical calculations indicate that any leak too small to be determined by bubble testing will afford loss of gas in such small quantities as to give pressure drops which are

NEW PRODUCTS

Dual Headed Hammers — Combination steel and rubber head affords dual use for both heavy and light work. Dan Morey, Department D-24, 814-16 South Robertson boulevard, Los Angeles 35.

Drafting Machine—Universal Boardmaster features centralized control group which locates every operating control at the fingertips of the left hand. Universal Drafting Machine Co., Cleveland 14.

Full Vision Splash Hood—Designed to give full head coverage on operations where hazard of acid splash, caustics, solvents and other substances is present. Industrial Products Co., 2833 North Fourth street, Philadelphia 33.

Catalog Binder—Tri-Lock opens flat and stays open at any point. Touch of a button changes compression binder into a flat reference binder. Control button unlocks binder. Systems & Methods Research Department. Remington Rand Inc., 315 Fourth avenue, New York 10.

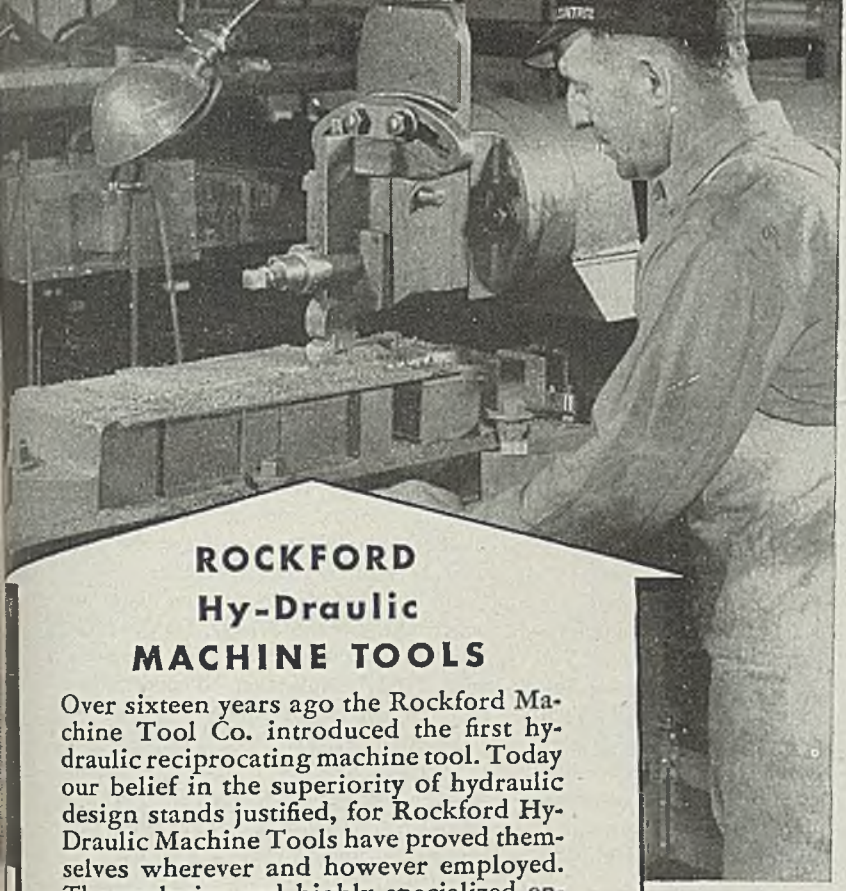
Roll Paper Dispenser—Mounted on wall and when several kinds of paper are used can be superimposed one above the other without interference. Paper tears off with clean smooth edge. Lefebvre Freres Ltd., Montreal 18, Canada.

Thermostat—For general application at 120-240 v ac. Constructed of aluminum and plastic. Cam-Stat Inc., 2037 South La Cienega, Los Angeles.

Coaxial Cable Connector — For making water-tight coaxial cable connections, for antennas, also serves as center insulator for half wave doublet. Made of aluminum with steatite insulation and has two forged steel eyebolts. Barker & Williamson, 235 Fairfield avenue, Upper Darby, Pa.

Corrosion-Resistant Coatings—Penetrates any porous surface, metals, wood, concrete and similar or allied products, blocking off moisture penetration, acid reaction, retarding corrosion, rotting and disintegration of structural material. Protective Coatings Inc., Box 56, Detroit 27.

Pressure-Compensating Packing Rings — Palmetto Pyramid Packing available in molded ring form and made to exact dimensions. May be used for rotary as well as reciprocal action. Greene, Tweed & Co., Bronx boulevard at 238th street, New York.



4608

ROCKFORD Hy-Draulic MACHINE TOOLS

Over sixteen years ago the Rockford Machine Tool Co. introduced the first hydraulic reciprocating machine tool. Today our belief in the superiority of hydraulic design stands justified, for Rockford Hy-Draulic Machine Tools have proved themselves wherever and however employed. The exclusive and highly specialized engineering experience that has been ours is fully applied in each machine tool we build.

Every Rockford Hy-Draulic Machine Tool offers such basic advantages as:

1. Ease of control for quick set-up and fast operation.
2. Stepless Speeds . . . infinitely adjustable throughout a wide specified range. Hy-Draulic tool-head feeds similarly adjustable.
3. Efficient, smooth hydraulic pressure . . . maintains cutting speed as set, no matter how work resistances vary.
4. Smooth, fast reversals and high return-stroke ratios. Oil flow through Hy-Draulic System reverses instantly. Simplicity of Hy-Draulic System holds inertia factors to a minimum.
5. Fine finish and long tool life. Smoothness of Hy-Draulic drive, free of mechanical play and vibration, protects work and cutter.

Rockford Hy-Draulic Machine Tools assure quality work with speed at minimum cost. Let the Rockford sales engineer give you complete information.

eyes on the job...

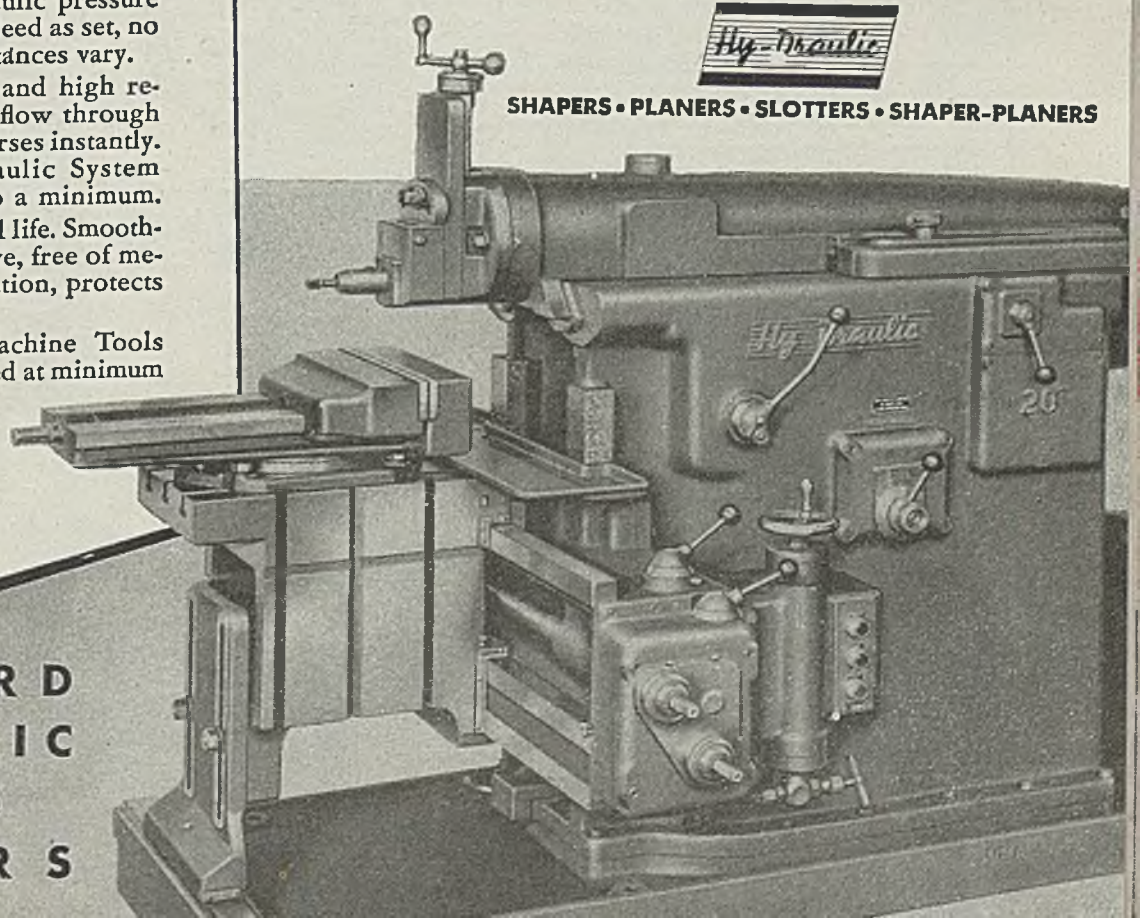
Whether your job is toolmaking, maintenance, or general machine shop work, the ease of Rockford Hy-Draulic shaper operation will be readily apparent. Rate of table feed and cutting speed, and length of cutting stroke are all obtained by simple lever control. Feed, speed, and cutting stroke length can be varied as required while the shaper is in operation. Such operating flexibility and ease are two advantages that result from Hy-Draulic drive and feed. The machine operator is free at all times to keep his eyes on the job. Control levers are all within easy reach.

To improve shaper work in your shop . . . to obtain faster work and better work, with minimum operator fatigue, investigate the Rockford Hy-Draulic Ram-type Shapers. Six rated stroke length sizes are available ranging from 12″ to 28″ stroke. Write for Bulletin 2918.

ROCKFORD MACHINE TOOL CO.
ROCKFORD, ILLINOIS

Hy-Draulic

SHAPERS • PLANERS • SLOTTERS • SHAPER-PLANERS



ROCKFORD HY-DRAULIC Ram Type SHAPERS

negligible so far as this program is concerned.

A mass spectrometer adapted as a helium leak defector proved a very adequate and desirable instrument for making an overall test of the finished container. Note Fig. 5. A container is charged with a mixture of helium in nitrogen or air to about atmospheric pressure. It is then placed within a chamber, such as a decompression chamber. The chamber housing the container is then evacuated, preferably to a very low absolute pressure. The mass spectrometer is connected to the vacuum chamber and samples are drawn into the spectrometer tube in which an absolute pressure in fractions of a micron exists. Any leakage of helium from the container to the vacuum chamber is indicated on the output gage of the mass spectrometer. By this method the presence of helium can be determined to a degree of sensitivity equivalent to one part in two hundred thousand.

It was originally agreed that finished containers of major combinations should be kept in storage at the production site for periods of probably 60 to 90 days to determine the fact that they were adequately tight for shipment to storage sites. Under a program where large production is required, vast storage spaces would be necessary under this method. The use of the mass spectrometer to indicate adequate tightness of containers immediately upon completion of their production would eliminate this necessity and present a very economical answer to this phase of the problem. The result is available in 1 min after 100 micron pressure is attained in the decompression chamber.

Book Covers Sawing Instruction Program

Intended primarily for use in educational and vocational institutions, Volume I of instruction programs for machine tools and gages covering the technique of contour sawing is being made available by DoAll Co., Minneapolis. Recognizing contour sawing as a vocation, the company states that the purpose of this first volume and the series as well, is to make better and more valuable operators with the end result being a savings in time, material and manpower.

First of the two general parts of the 264-page book covers conventional contour sawing. Chapters on set up and operation, for filing and for cutting, attachment demonstrations, maintenance, training aids, vocational films and tool making with contour saws are included in this section along with projects and grading guides for determining progress.

Part Two covers friction sawing as to saw selection, cutting rate, saw life, etc. Applications of friction sawing to aluminum, ferrous castings, formed work, plastics and other materials are also covered as well as friction contour sawing.

Other parts of the training book are concerned with the Zephyr, DoAll's high-speed sawing machine, band filing lectures and maintenance demonstrations and the company's research laboratory.

Volume I of this instructional program is available for use in industrial training programs as well as to vocational schools and educational institutions, details being obtainable from the company.

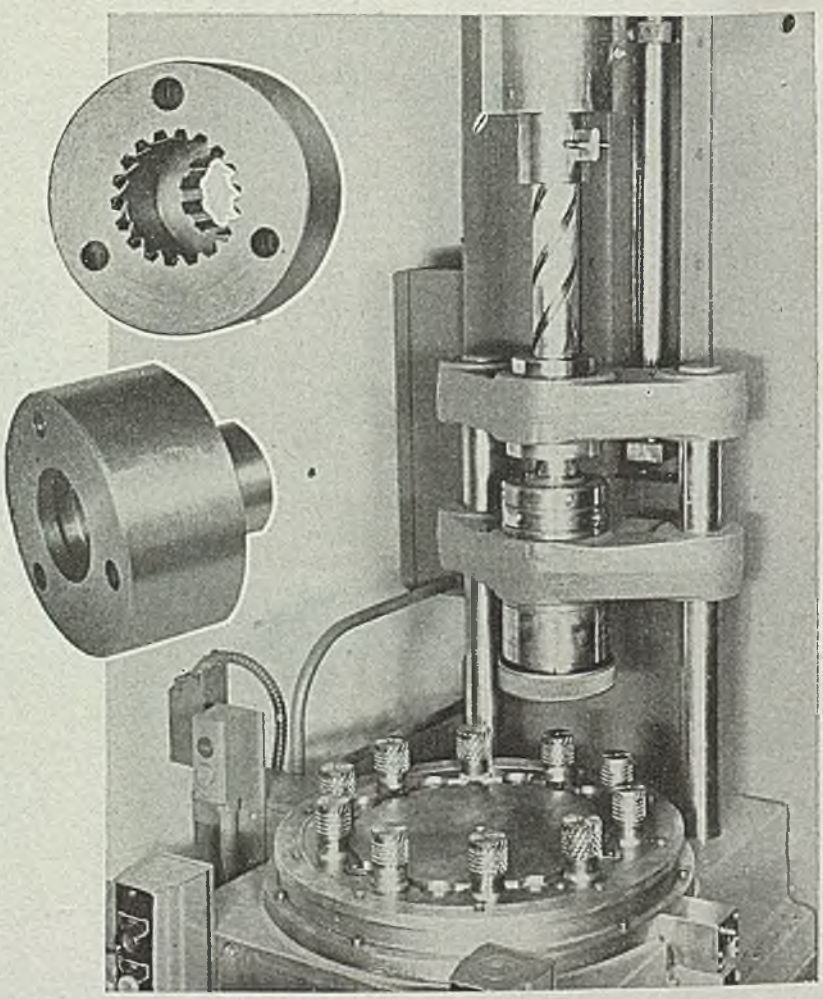
BROACHING BLIND HOLES

AN unusual use of broaching has been developed by Colonial Broach Co., Detroit, for production of helical splines in a blind hole connection with transmission part, the design being such that the tool cannot pass through the work. Use of broaching was made possible by undercutting a recess beyond section of part to be splined for broach clearance at end of cut. Inset shows part before and after broaching.

Ten short broaches, each with five sets of cutting teeth, are used in place of a single long broach, note illustration. The part is held in a moving ram head which is equipped with a master lead bar actuated by movement of ram. Broaches are mounted on a hydraulically actuated indexing table.

The machine cycle is completely automatic, operator merely loading part and pushing a button to start ram moving down, and pushing part over the first broach. The ram returns and stops, and table automatically indexes to next station, after which the cycle is repeated, continuing until part is finished.

As part is stripped off the broach on each return stroke, broaches must be exactly spaced and located so teeth of different broaches will track each other as they progressively cut spline to finished size and shape. Cutting effect of the 10 short broaches is the same as if a single long broach were used.

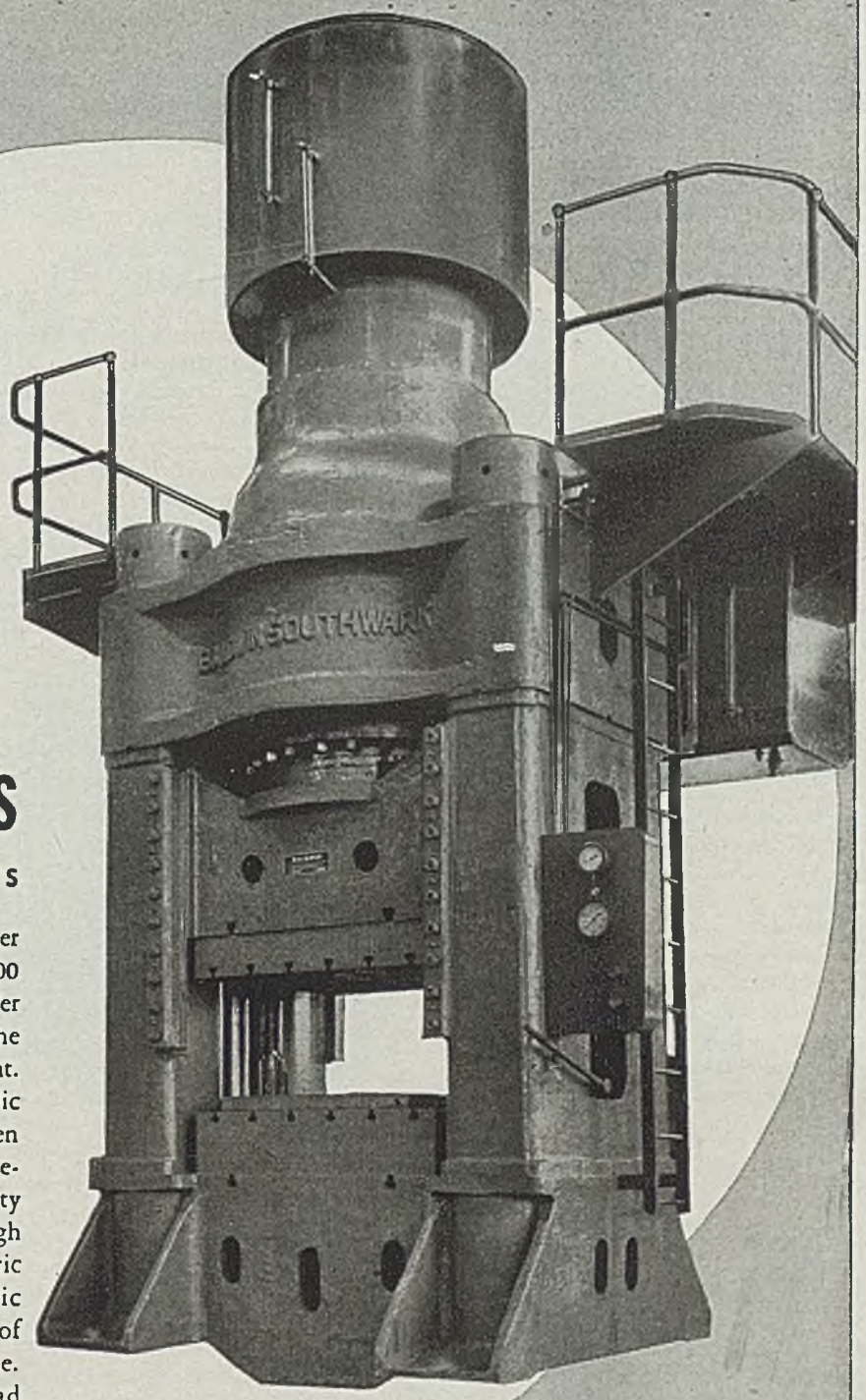


another Baldwin Hydraulic Press

TO SPEED NEW PRODUCTS

A large consumer goods manufacturer has recently purchased his second 200,000 lb. Baldwin Hydraulic Press. A re-order is always the best testimonial to the quality and performance of equipment.

This fully-automatic Baldwin Hydraulic Press combines all the newest proven developments to step-up production, reduce rejects, provide for maximum safety and give ease of operation. Has high approach and pressing speeds, electric eye-safety control. Baldwin Hydraulic Presses offer the unusual combination of custom-built quality in the standard line. A Baldwin Field Engineer will be glad to discuss your press problems with you. The Baldwin Locomotive Works, Locomotive and Southwark Division, Philadelphia 42, Pa., U.S.A. Offices: Philadelphia, New York, Chicago, St. Louis, Washington, Boston, San Francisco, Cleveland, Detroit, Pittsburgh, Houston, Birmingham, Norfolk.



Self-contained, moving down type. 24-ft. high, 50-in across, 200,000 lbs. weight. Single-acting ram, 43-in. diameter with 24-in. stroke, 28-in. daylight.

BLW THE BALDWIN GROUP

BALDWIN

SOUTHWARK

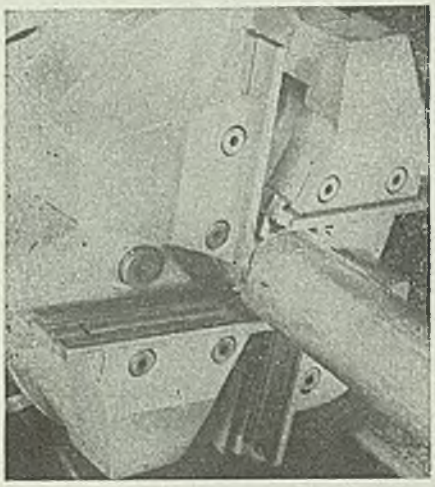
HYDRAULIC PRESSES

Industrial Equipment

Throat Chaser

Landis Machine Co., Waynesboro, Pa., announces a centering throat chaser for work that must have threads concentric to outside diameter. It is especially adapted to threading of valve stems and other long length threads of coarse pitches.

Chaser is used only when outside diamter of work is held uniform since center-



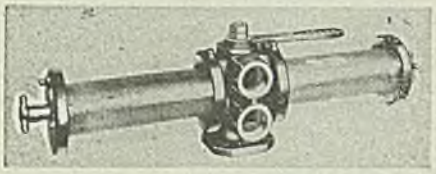
ing throat section of chaser takes a bearing on the outside diameter. It is also flexible in that any difference on outside diameter can be corrected on the centering throat to maintain proper pitch diameter.

Another feature of the chaser is it eliminates out of round condition that exists when long work pieces are threaded. Centering throat takes a bearing as soon as chaser contacts work and assures accurate and well formed threads from the start.

Steel 9/16/46; *Item No.* 9545

Duplex Pipe Line Strainer

A new duplex pipe line strainer made with a transparent Lucite casing that permits visual inspection is offered by J. A. Zurn Mfg. Co., Erie, Pa. Without disturbing the strainer, a maintenance



man, engineer or operator can see whether strainer unit needs cleaning. If it does, flow can be diverted into the other chamber without loss of pressure and the filled chamber can be cleaned while the pipe line maintains its normal flow.

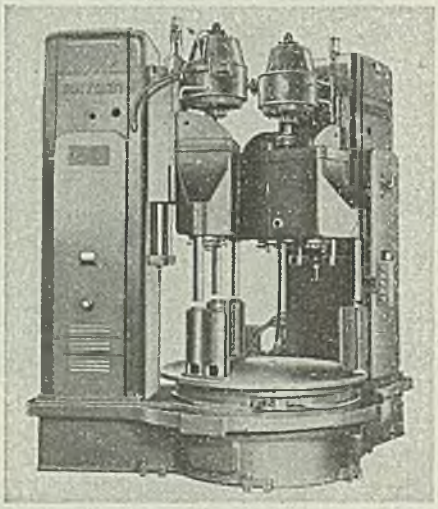
Large open area capacities afford free movement of fluids throughout the unit; 16 to 1 ratio with 12 in. tubes and 8 to 1 ratio with 8 in. tubes. Of flat horizontal design, strainers are made with bronze bodies, handle, caps, tie rods and nuts; strainer baskets are available in brass, monel or other metal.

Steel 9/16/46; *Item No.* 9766

Boring Machine

Compressor casings and cylinders in a wide variety of sizes are bored by a special purpose machine manufactured by Snyder Tool & Engineering Co., 3400 East Lafayette, Detroit. While primarily intended for dry work on cast iron, base of machine is designed also for use of coolant.

Machine consists of a welded steel base upon which are mounted two hydraulic



column and platen assemblies and a manually-operated index table operating upon antifriction bearings. Each of two-spindle boring heads is driven from an individual variable-speed direct current motor, and each boring spindle is equipped with special clamps to permit boring bars to be exchanged quickly.

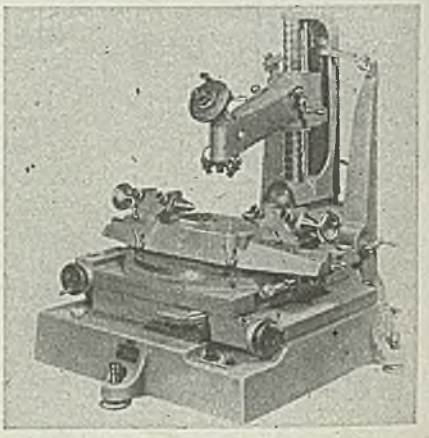
Spindle speed is controlled by rheostat to motors and is shown on an indicator. After setting, spindle speed, rate of tool feed and depth of cut are automatically maintained.

Steel 9/16/46; *Item No.* 9588

Toolmaker's Microscope

Gaertner Scientific Corp., 1201 Wrightwood avenue, Chicago 14, announces a large toolmaker's microscope having a mechanical stage with a co-ordinate range of 8 x 4 in. combined with 360 degree rotary motion and capable of supporting a load of several hundred pounds. Co-ordinate motion is by means of micrometer screws which reads to 0.0001-in. Angular measurements can be read to 1 min. Principal applications include inspection and measurement of large tools, jigs, templates, machine parts, threads and similar items being held to close tolerances.

Instrument consists of mechanical stage, a 30-power microscope mounted on a support column which has microm-



eter-tilt up to 15 degrees each side of vertical, a removable cradle for supporting objects not readily mounted on the flat surface of stage, and suitable surface and substage illuminators.

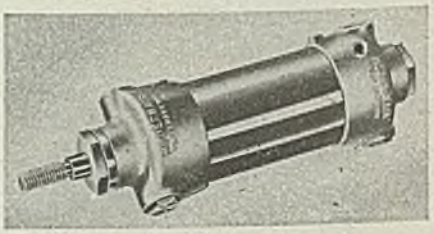
Microscope is equipped with an internal protractor for rapid angular measurements to ½-degree and a protractor ocular head by means of which angles may be read to 1 min. Magnifying power can be varied from 10 to 100 by interchangeable objectives.

Steel 9/16/46; *Item No.* 9589

Cushion Type Cylinder

A cushion cylinder featuring interchangeable mounting developed by Modernair Corp., 4222 Hollis Street, Oakland 8, Calif., is designed to permit diversified use of the same cylinders.

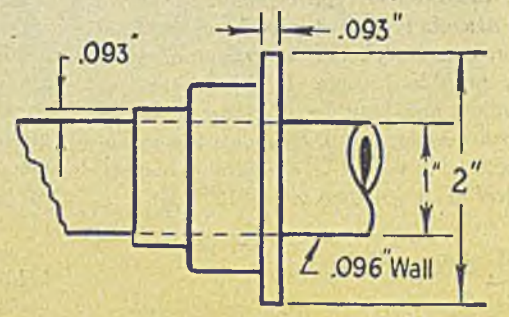
Cylinder caps are heat treated alumi-



num alloy sand castings with high tensile and bursting strength. Design permits caps to rotate 360 degrees on cylinder without disturbing seal, a feature which generally eliminates need for elbow or "T" fittings to bring a line into or out

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 136.)

How "Job-Rating" can improve YOUR designs!



TYPICAL JOB

Assemble and join thin mild steel stampings and tube to resist torque, compression and shear.
No distortion or surface marking permissible on tube.
Total units required—50,000
Production required—1200 per 8-hr. day

JOB-RATING

METHOD	BEST OUTPUT	MAX. STRENGTH	MIN. FINISHING REQUIRED	LOWEST COST PER PIECE
SPOT WELD	1	1	1	1
ARC WELD		2		2
TORCH WELD				
SOLDER (TORCH)			2	
FURNACE BRAZING	2			

List possible joining methods and controlling factors, as above.
Rate the methods 1, 2, for each design factor.
Select the best method. Check your design with this method in mind.

ANALYSIS

Watch resistance welding come up No. 1 on every count! This example shows over 70% savings for spot welding over the second best method, in labor costs alone. In addition, strength is "tops". There is no distortion. Output is far ahead of other methods. Only design factor involved is to make sure there is room on the sleeve for the spot welds. Your analysis may also show similar advantages for resistance welding in a vast majority of assembly problems. 'Progressive' machines, such as the spot welder at left, prove that it pays to weld on job after job. Send for "Welding at Work"—booklet WP-44—describing over 100 different "Progressive-Welded" designs.

IT PAYS TO WELD

PROGRESSIVE Welder Co. 3050 E. OUTER DRIVE • DETROIT 12

RESISTANCE WELDING EQUIPMENT

of this cushion type cylinder.

Aircraft type O ring packings are used throughout cylinder at points of wear or possible leakage. It is corrosion resistant, and may be used for actuation by air, water or oil. Cylinders are manufactured in 2, 3, 4, 5, and 6 in. diameters.
Steel 9/16/46; *Item No.* 9613

Electropolisher

Buehler Ltd., 165 West Wacker drive, Chicago 1, has developed Buehler-Waisman electropolisher for polishing both ferrous and nonferrous metals, using only a small amount of nonexplosive solution. In operation, the specimen is made the anode of an electrolytic cell. Charged atoms or ions from the specimen enter the electrolyte, resulting in a polishing film

which covers surface of specimen and offers resistance to passing of the current.

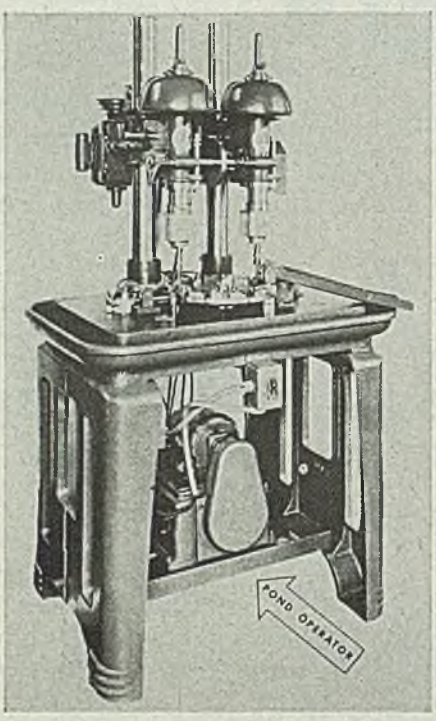
Processing results in a uniformly flat surface as the polishing film is thinner on the high spots, allowing more current to flow in these areas and consequently removing more metal. Advantage of electropolishing is freedom from disturbed metal on surface of sample—an important consideration with those metals which are susceptible to co'd working. Many samples may be etched after polishing, with same solution, by reducing applied voltage.

Electrolyte is contained in stainless steel tank. Specimen is fitted over hole in tank and brought into contact with solution by tilting tank down. This action operates mercury switch which starts agitating pump. Switches, meters and knobs for controlling duration of polishing and etching are mounted on control panel.
Steel 9/16/46; *Item No.* 9760

Tapping Machine Converter

Pond Engineering Co., Springfield, Mass., has designed an automatic control unit for converting hand-operated tapping units to automatics, with an increase in production rate of many small parts. Accurate indexing, locating, clamping, tapping and ejecting are all accomplished on a turntable fixture actuated by Model 600.

In machine shown, two different pieces are handled simultaneously—each piece having one hole to be tapped—and pieces are even separated during ejection, by chute which is divided in the middle. An attendant is required to feed the machine if the piece can not be adapted to hopper or magazine feed. Different pieces of a similar nature can be handled on this same machine, simply by changing holding blocks on turntable. Combined operations—drilling, tapping, reaming,



riveting, grinding, and many others are possible.

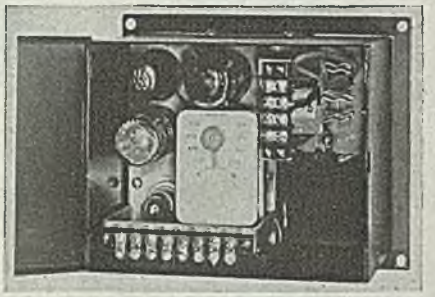
Machine is primarily a control unit with a one cycle air-clutch-operated cam shaft, powered by a 1/3 hp motor. Cycle speeds are adjustable from 2 to 1 min depending upon the operation performed, but longer cycles are available. Frequency and duration of impulses per cycle are adjustable on air valve cams.
Steel 9/16/46; *Item No.* 9625

Thermal Protector

Manning, Maxwell & Moore Inc., Bridgeport 2, Conn., announces a new Ashcroft thermal protector—a thermocouple actuated limit switch for use in air ducts of industrial ovens, dryers, bearings of large motors, blower wheels, flue gas stacks of boilers, plastic injection presses and reheaters. Temperature chosen as high limit is set by an operating knob located inside case. If this temperature is reached, the device will stop apparatus before excessive damage is done, or it can be arranged to sound an alarm or light a light.

Device will also stop in case of burning or breaking of thermocouple, failure of power supply, tube or mercury switch. Further protection is provided by a manual reset which makes certain that something is done to correct the cause before the equipment is damaged or production is seriously interrupted.

Thermal protector is designed with two ranges, 100° F to 1000° F using an IC couple, and 800° F to 2000° F using an alternating current couple with an accuracy of 2 per cent of range at a



set point. Two or more couples may be connected, in series if desired. Current characteristics are 115-230 v 60 cycle ac 15-20 w.
Steel 9/16/46; *Item No.* 9624

Live Centers

Royal Products, New York, is introducing a line of Monarch live centers, interchangeable for different operations that have an accuracy of plus or minus 0.0001-in. tolerance when points are interchanged. Accuracy is achieved through tapered seat on points and in base which meet and align point.

Live centers enable deeper cuts to be taken at higher speeds with no burned out or scored center holes. It is greased through opening formed when point is removed. Replacing of point seals bearings against foreign matter. Centers may be used in lathes, screw machines, cylindrical grinders, milling machines and thread millers.
Steel 9/16/46; *Item No.* 9452

Drum Sling

Trylon sling kits for all light weight lifting introduced by Wire and Cable Division of Wind Turbine Co., West Chester, Pa., are designed for hoisting drum type containers. Slings make handling of barrels, kegs, chemical and oil containers, large cans and similar items a safe operation.

Heavy clips mounted on a rod with an adjustable pressure spring at each end of the sling grip the container securely until it is deliberately released. Spacing of clips can be altered and positioned to fit any size barrel, drum or keg. Sling

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 136.)

SIMPLEX

ELEMENTS OF COST REDUCTION

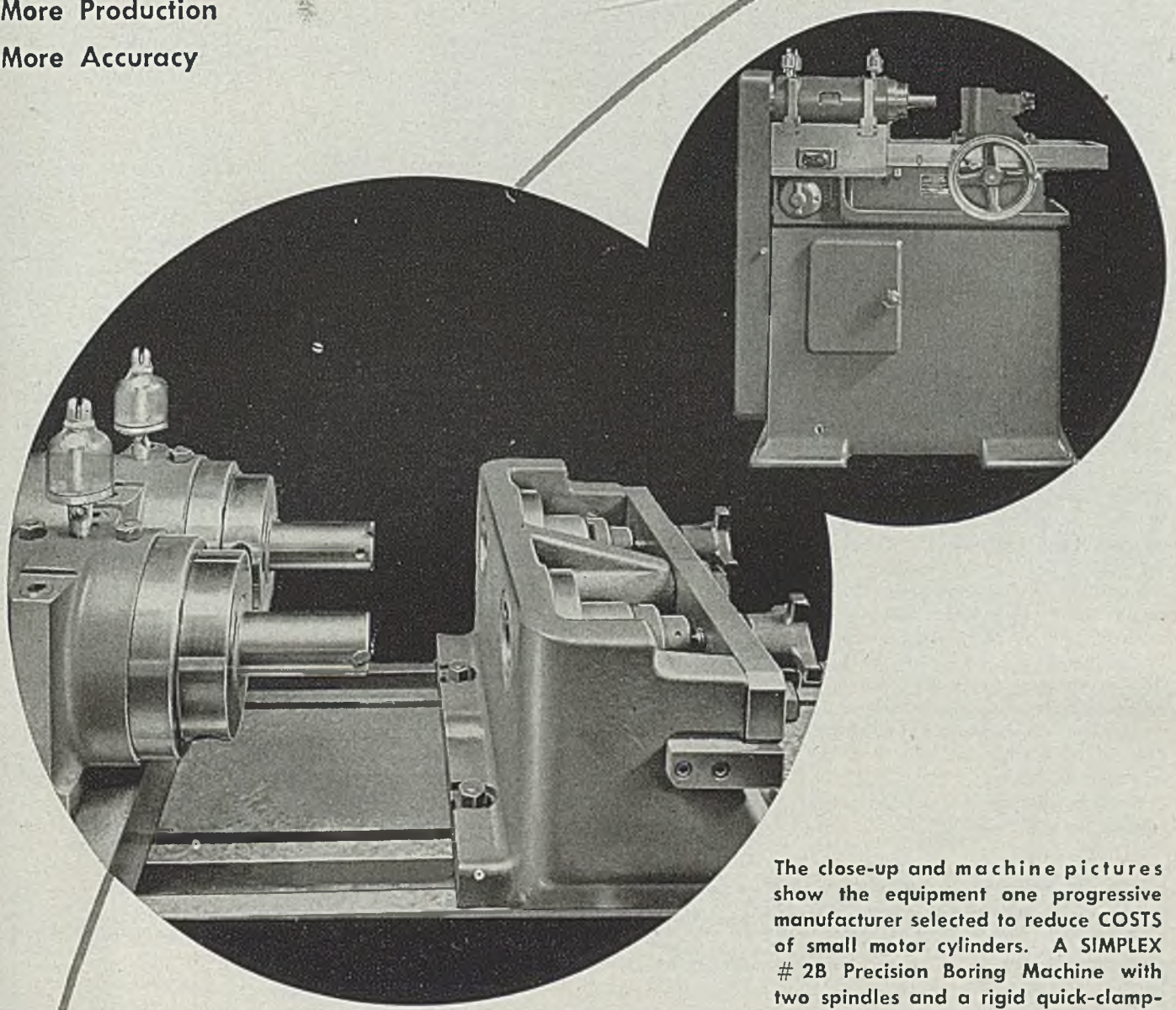
Low Labor Cost

Low Tool Cost

Low Machine Cost

More Production

More Accuracy



The close-up and machine pictures show the equipment one progressive manufacturer selected to reduce COSTS of small motor cylinders. A SIMPLEX # 2B Precision Boring Machine with two spindles and a rigid quick-clamping fixture provide all the elements of cost reduction listed above.

Precision Boring Machines

STOKERUNIT CORPORATION

SIMPLEX Machine Tools Division

4532 West Mitchell Street, Milwaukee 14, Wisconsin

Precision Boring Machines, Planer Type Milling Machines and Special Machine Tools

is equipped with 5/16-in. plow steel wire rope and has a minimum breaking strength of 8000 lb.

Steel 9/16/46; *Item No.* 9542

Flexible Shaft Grinder

Spring Specialty Co., Maywood, Ill., announces a high speed, direct connected Leigh flexible-shaft grinder which operates at a free speed of 18,000 rpm. High speed shaft embodies an inner liner, and the special type ball-bearing spindle has an integral, key-operated ¼-in. collet which also can be provided with auxiliary insert reducing collets to accommodate ⅛, 3/32 and 3/16-in. arbors.

The grinder motor is a ¼-hp, alternating current-direct current type, provided with end ring for suspension and rubber-footed base for bench use. Variable speed rheostat or line switch is optional.

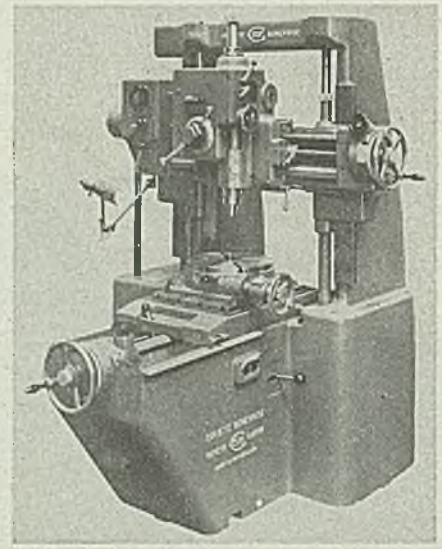
Steel 9/16/46; *Item No.* 9456

Jig Borer

Cosa Corp., 405 Lexington Avenue, New York, representatives in United States for Societe Genevoise D'Instruments de Physique of Geneva, Switzerland, announce availability of a type 3 K, SIP jig borer, of the planer type, which provides a working surface of 20½ x 15 in. on its table.

There are no loose instruments to be handled for locating hole centers on the machine, and direct readings are made to 0.00005-in. on verniers of large divided drums. Automatic correctors compensate for errors in measuring devices. Guaranteed accuracy for all settings of work table and spindle saddle is within 0.0002-in.

Machine features eight spindle speeds ranging from 75 to 2000 rpm. Six automatic feeds in either direction assure rapid operation on a variety of work. Cross-rail is traversed vertically by a motor driving two elevating screws. Latter extend downward into the bed



and are automatically lubricated by oil baths. Machine also is supplied with a special guiding arm to facilitate machining of very small holes.

Steel 9/16/46; *Item No.* 9584

Threaded Chucks

Westcott Chuck Co., Oneida, N. Y., is manufacturing light-duty threaded chucks which screw directly on the spindle of any of several popular lathes equipped with a 1½-in.-8 threaded spindle nose. Made to center within 0.003-in., chucks are of semisteel and jaws of hardened and ground steel.

Chucks are offered in two styles—style 6900, or universal, and style 5900, or independent. Universal styles are manufactured in 5 and 6 in. sizes. Independent chucks are made in one size, 6 in.

Steel 9/16/46; *Item No.* 9455

High Speed Grinder

Compact, high speed grinder manufactured by Wyzenbeek & Staff Inc., 838 West Hubbard street, Chicago 22, may be set on a bench, hung from a hook or suspended from operator's belt for complete mobility. Made with motor sizes of ¼, 1/12 and 1/18 hp, all have speed of 10,000 rpm. Motors are of alternating or direct-current type.

Flexible shafts are oil-proof synthetic rubber covered and lined with graphite impregnated innerliner, insuring a vibrationless, true-running shaft.

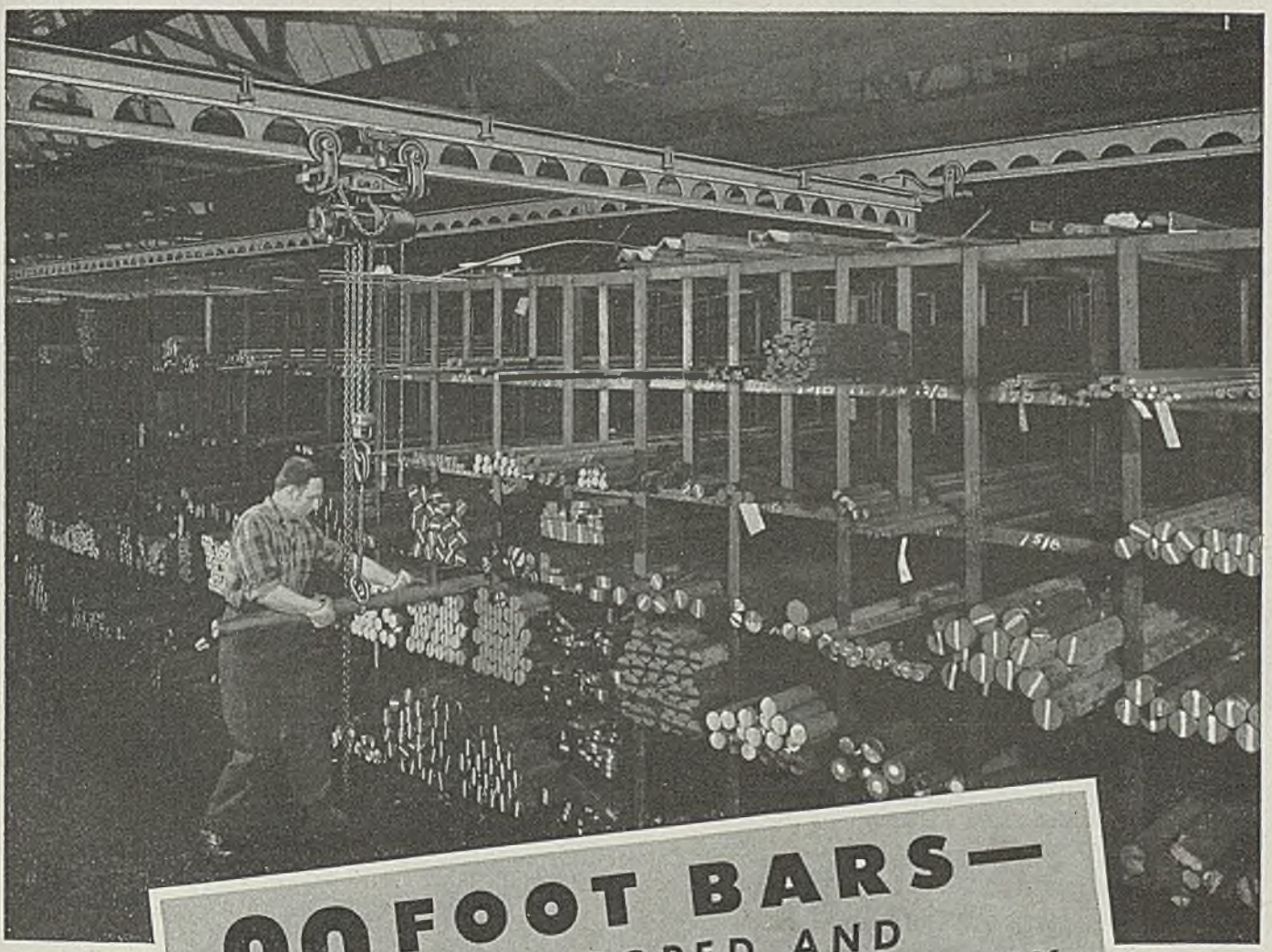
Steel 9/16/46; *Item No.* 9480

Grinder Attachment

A high-speed surface grinder attachment, the Stafford Blitzrev, is being manufactured by D. & S. Model Co., 3114-54 East 3rd street, Dayton 3, O. Attachment can be installed on most standard makes of surface grinders and permits operator to use small grinding wheels from ⅛-in. mounted quills to 3 in. diameter wheels.

Speeds of 10,000 and 15,000 rpm are attainable with the standard 2-step pulley. A fan mounted on revolving shaft inside housing sets up an airflow outward, preventing entrance of dirt and dust.

A drive pulley is mounted on surface grinder spindle, replacing the standard 7-in. wheel. Pulley, by means of a belt, drives spindle of attachment. A dovetailed arrangement allows a forward and backward movement of attachment, permitting grinding over full surface of mag-



20 FOOT BARS— STORED AND HANDLED EFFICIENTLY

It is not only faster and easier to store and handle stock this way, but safety is greatly improved.

WITH a simple rack arrangement and overhead tramrail crane to serve it, long unwieldy steel stock can be stored in an orderly fashion and grouped according to shape, size and alloy.

The smooth rolling crane with hand-propelled or electric hoist makes it easy for a man to handle the bars in and out of the rack and deliver them to the saws or machine tools directly without rehandling.

What a vast improvement this is over the haphazard time-consuming way of storing and handling stock still prevalent in so many plants today. There is no tugging, lugging and back-breaking lifting while searching for stock needed. The stock is always in its place where it is quickly found. There is no uncertainty as to the amount on hand, because the supply is out in the open where it can always be seen.

Hundreds of metal-working plants and steel warehouses are now enjoying the many advantages that Cleveland Tramrail equipment provides. There are installations of every type from simple hand-propelled carriers and cranes to complete automatic systems that transport materials without need of accompanying operator.

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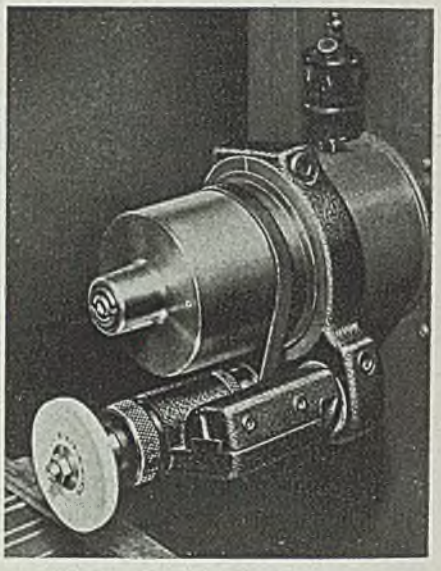
CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
1125 EAST 283RD ST. WICKLIFFE, OHIO.

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

netic chuck. Attachment also may be swung through 360°, allowing grinding



farther to left or right, increasing the capacity.

Steel 9/16/46; *Item No.* 9555

300-Ampere Welder

A development of Hobart Bros. Co., Troy, O., is a 300-amp gasoline-driven arc welder with a built-in auxiliary alternating current generator. An oversize separate exciter supplies excitation to both welding generator and alternating current generator of the welder.

Four combinations of power can be furnished the unit simultaneously, with the arrangement of connecting stations and panel of generator. Unit is offered in two sizes, 6 and 12 kw.

Steel 9/16/46; *Item No.* 9429

Gas Analyzer

Type TB gas analyzer for continuously recording or indicating concentration of one component of mixed gases whose characteristics can be detected by thermal-conductivity principle is announced by General Electric Co., Schenectady, N. Y. Instrument can be used over a wide range of gases and gas concentrations. It will detect impurities in hydrogen, carbon dioxide, sulphur dioxide, or any one of many organic vapors, provided the impurity has a different thermal-conductivity from that of the gas being analyzed.

To adapt analyzer to varied applications, a different reference gas can be obtained for each application. A change of instrument scale and a new cell block containing this gas, permits an analyzer designed for one atmosphere to be applied to one that is radically different.

Gas analysis is registered on any stand-

KEYSTONE ALLOY CHISEL STEEL

A Disston tool steel designed for the tougher metal-cutting jobs

This carefully worked alloy adequately meets each of the requirements of a high quality chisel steel. It has high heat resistance . . . up to 600° F. in the tool. It is exceptionally tough, outperforming most chisel steels regardless of their price. It has high compressive strength, lasts long in hard and steady service. And it is economical.

Because it can stand up under many blows per second, Keystone Alloy Chisel Steel is specially recommended for pneumatic chisels running on air pressures above 100 pounds per square inch at the hammer.

It is also extensively used for making hot punches, shear blades, pipe cutters, welded tube-bending mandrils and similar applications.

And it has proved to be well suited for die blocks having sharp impressions and subject to breakage.

Disston has a number of special steel analyses for chisels used in various types of chipping. Among them you will find one that fully meets your needs. Write to us for recommendations and sample.

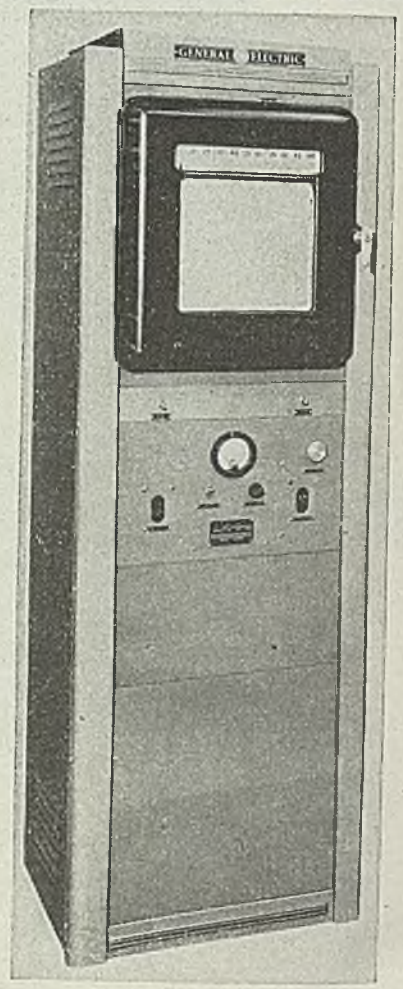
ESTABLISHED 1840
REG. U.S. PAT. OFF.

ANALYSIS			
Carbon	.50%	Tungsten	2.00%
Chromium	1.10%	Vanadium	.20%

● *LET DISSTON ENGINEERS HELP SOLVE YOUR TOOL STEEL PROBLEMS*

HENRY DISSTON & SONS, INC., 926 Tacony, Philadelphia 35, Pa., U. S. A.

ard indicating or recording instrument, which can be equipped with contacts for closing an alarm circuit when the con-



centration reaches a preset maximum or minimum value.
Steel 9/16/46; *Item No.* 9554

Punch Presses

Announcement of two power punch presses capacity rated at 12 and 14 tons is made by Diamond Machine Tool Co., 3429 East Olympic boulevard, Los Angeles 23. Inclinable, open-back presses, feature a 6½-in. opening in back of frame and will incline 40 degrees.

Bed area is 8 x 15 in. and bed opening 5 x 7 in. for both new models. Standard stroke for No. 12 is 1½-in. and 2 in. for No. 14. Presses are compact, requiring only 28 x 28 in. floor space.
Steel 9/16/46; *Item No.* 9566

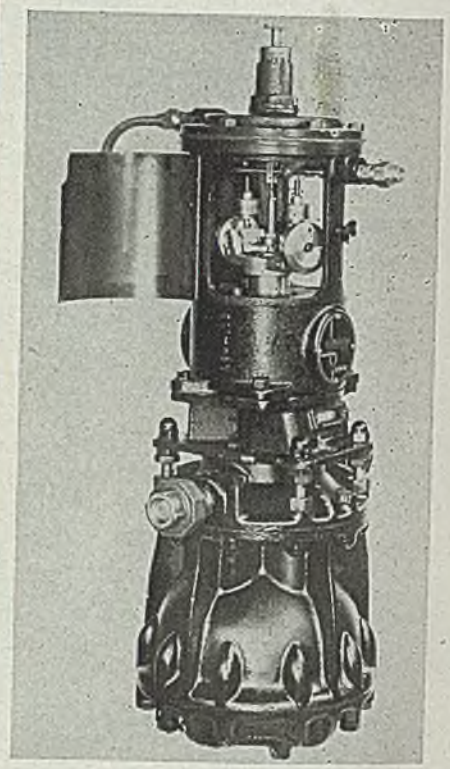
Oil Flow Regulator

Heavy fuel oil is controlled, integrated and recorded by a unit called the Transometer manufactured by Askania Regulator Co., 1603 South Michigan avenue, Chicago. It is a combination piston type, positive displacement meter and a pneumatic signal transmitter.

Unit can be used with other liquids, particularly viscous fluids because its

accuracy is unaffected by viscosity changes.

With excess power, even at lowest flows, it is adaptable to applications



where wide flow variations are encountered.

Steel 9/16/46; *Item No.* 9567

Flow Metering Device

Fischer & Porter Co., Hatboro, Pa., is producing a small, low capacity flow rate metering instrument, the Junior Rotameter, for measuring leakage from inert gas pipe jackets for fire prevention, regulation of product flow and purging of

chemical service manometer lines. Milled from carbon steel, stainless steel or brass blocks and held together by a pressed steel shroud, device has ¼-in. pipe connections which face directly to the rear.

Metering tubes are 1½-in. long and floats are aluminum for gas service and stainless steel for liquids. Capacity ranges

RUST PREVENTION

How to Eliminate Stains and Rust in Grinding Operations

EFFECTIVE PRODUCT SAFEGUARDS MACHINED PARTS AFTER REMOVING FINGER STAINS

Lubrication Engineer's Report

"In any grinding operation, wet or dry, there is a definite tendency for the metal to be stained with the finger prints by handling, after the operation is completed. In wet grinding operations there is a strong and definite tendency to stain plus formation of a froth of rust.

"Atmospheric conditions have frequently caused rusting regardless of the richness of the grinding mixture. To combat this difficulty in the manufacturing operations of two St. Louis concerns*, we recommended the application of Cities Service Anti-Corrode No. 148.

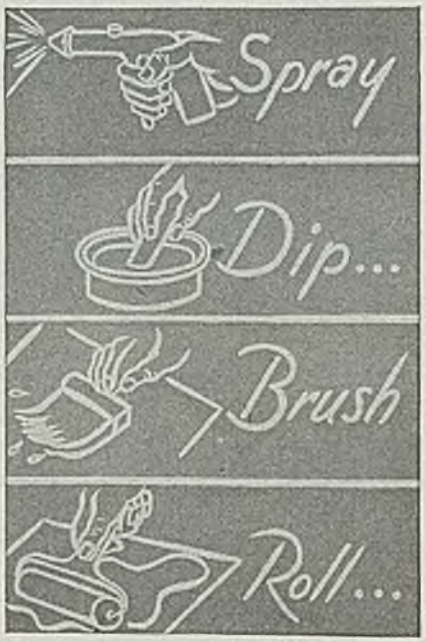
"This product has proven very successful in removing finger stains as well as providing a suitable protection against rust until the part is shipped or assembled into a complete unit.

Slight "Dragout" Losses

"A very desirable feature of Cities Service Anti-Corrode No. 148 is that it does not form a thick film which would make further handling disagreeable, and it is of such low viscosity that the user has only slight 'dragout' losses and his 'drippings' are negligible.

"These two concerns have been satisfied to such an extent that we now supply them with practically 100% of their oil requirements."

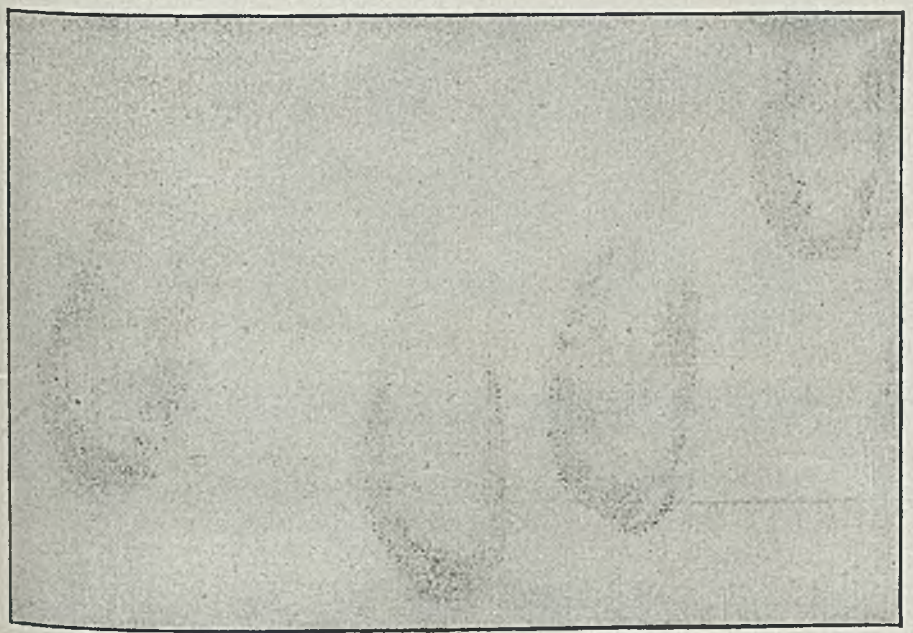
Cities Service Lubrication Engineering



Engineering Service Available

service is available without cost or obligation for any rust or lubrication problem. Call your nearest Cities Service branch office, (Arkansas Fuel Oil Co. in the South), or write to Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

*Names on Request



Actual unretouched photograph showing the corrosive effect of fingermarks on stainless steel.

CITIES SERVICE OILS
ONCE-ALWAYS

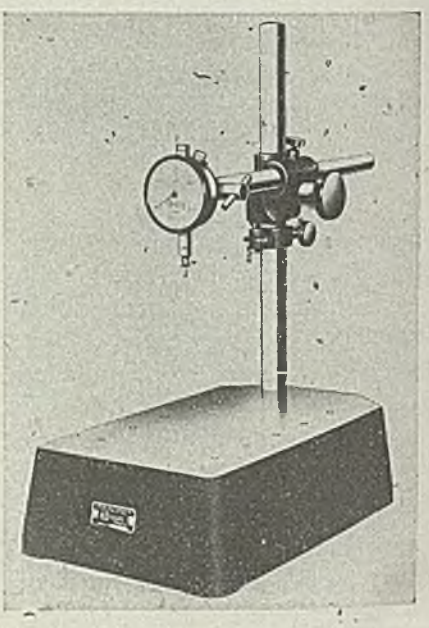
FOR EVERY LUBRICATION PROBLEM CALL Cities Service FIRST!

for various models for water service range from 3.5 cc per minute to 0.90 gpm. Air at 70° F, 14.7 psi is metered by the devices which have ranges according to the model from 50 cc per minute to 0.90 cfm.
Steel 9/16/46; *Item No.* 9594

Comparator Gage

A dial comparator model, designated as No. 107, is the latest product of Standard Gage Co., Poughkeepsie, N. Y. It is adapted to a variety of uses because of its extensible indicator support arm.

By means of a double clamp arrangement, indicator support arm may be slid



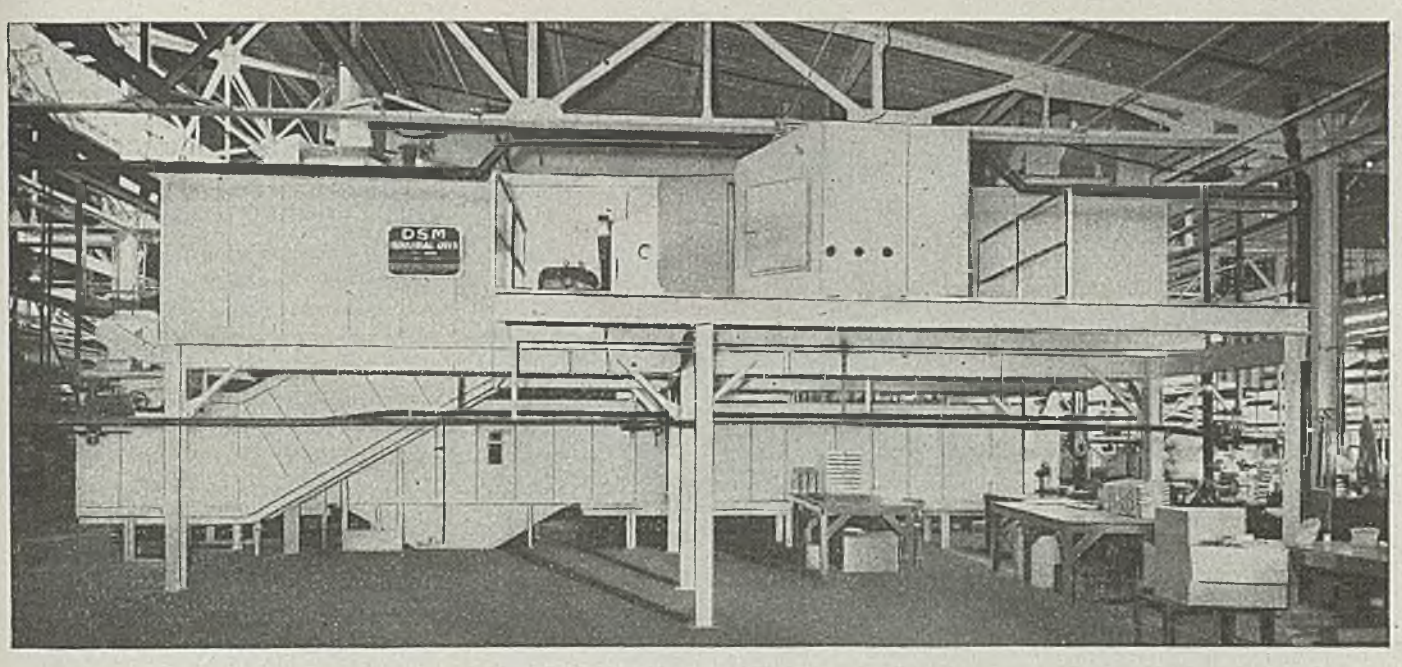
up or down on vertical column, swung to any angle in either a horizontal or vertical plane, and moved to place indicator at the desired distance from column. Setting is facilitated by a vernier screw. A friction washer in swivel prevents indicator arm from dropping unintentionally when clamp is loosened for adjustment.
Steel 9/16/46; *Item No.* 9524

Horizontal Grinder

Master Pneumatic Tool Co. Inc. is marketing a new line of light weight Master power horizontal grinders embodying

magnesium housings in which industrial hard chromium is used on main wearing parts.

Correct load and free speeds in such grinder are controlled by quick acting, push valve governor, regardless of fluctuating air pressure, and which will not run away with use. Eight light and heavy-



CUSTOM BUILT HIGH CAPACITY INSTALLATION

DSM

CROSS FLOW CIRCULATION

FOR ACTUAL SURFACE CONTACT

Properly applied, DSM designed CROSS FLOW heating systems effects a gentle wiping action on all surfaces—sides —tops—bottoms—of your product, to be dried or processed. Resulting in speedier baking and a more uniform product.

Drying from center outwards avoids case hardening

WE WANT TO BUILD ***YOUR*** *OVENS*

PLANT ENGINEERING: *Consulting assistance in plant layout to coordinate departmental operations, our experience dated from 1917 in this field.*

Such plant layout may be based on increasing production beyond present capacity, or it may be a rearrangement in this post-war period when operations are conducted under a new set of conditions.

MOTOR CLEANING EQUIPMENT: *Washing machines for cleaning teardowns. Kerosene spray or similar solvent usually used as the cleaning medium.*

FORMED COWLINGS, PANELS, ETC.: *To your specifications, and of light metal alloys as required. Weldments and brazed assemblies may be under controlled atmosphere.*

PILOT EQUIPMENT: *Sample size equipment for development of heavy equipment.*

VERTICAL CORE BAKING OVENS • CONTINUOUS HORIZONTAL BAKING OVENS • BATCH TYPE CABINET OVENS • DRAWER OVENS

DETROIT SHEET METAL WORKS
1296 OAKMAN BOULEVARD, DETROIT 6, MICHIGAN

METAL FINISHING EQUIPMENT *by*

DETROIT SHEET METAL WORKS

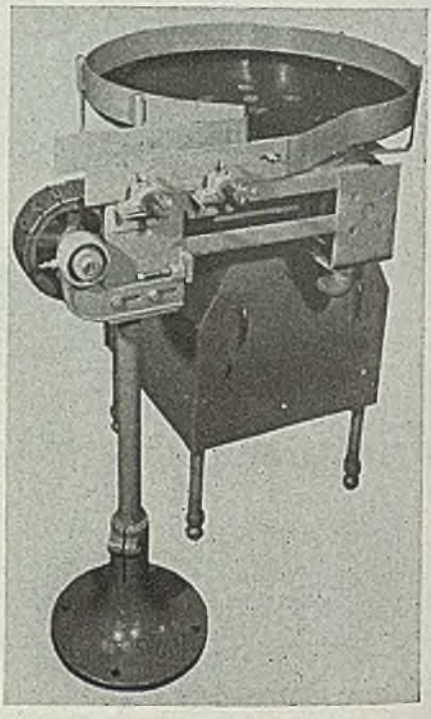
1306 Oakman Boulevard DETROIT -6- MICHIGAN

PAINT SPRAY HEATING, VENTILATING, COOLING, DRYING, HUMIDIFYING SYSTEMS, JAPANNING AND INDUSTRIAL OVENS, INDUSTRIAL WASHING MACHINES

duty models are being manufactured for wheels of 4 to 8 in. in diameter.
Steel 9/16/46; *Item No.* 9543

Accumulating Table

Rotary accumulating table which provides a reserve reservcir to temporarily handle excess containers or whatever might be on the conveyor when the feed of the conveyor is greater than the operating equipment is latest product of Island Equipment Corp., 101 Park avenue, New York 17. It consists of a unit with a square



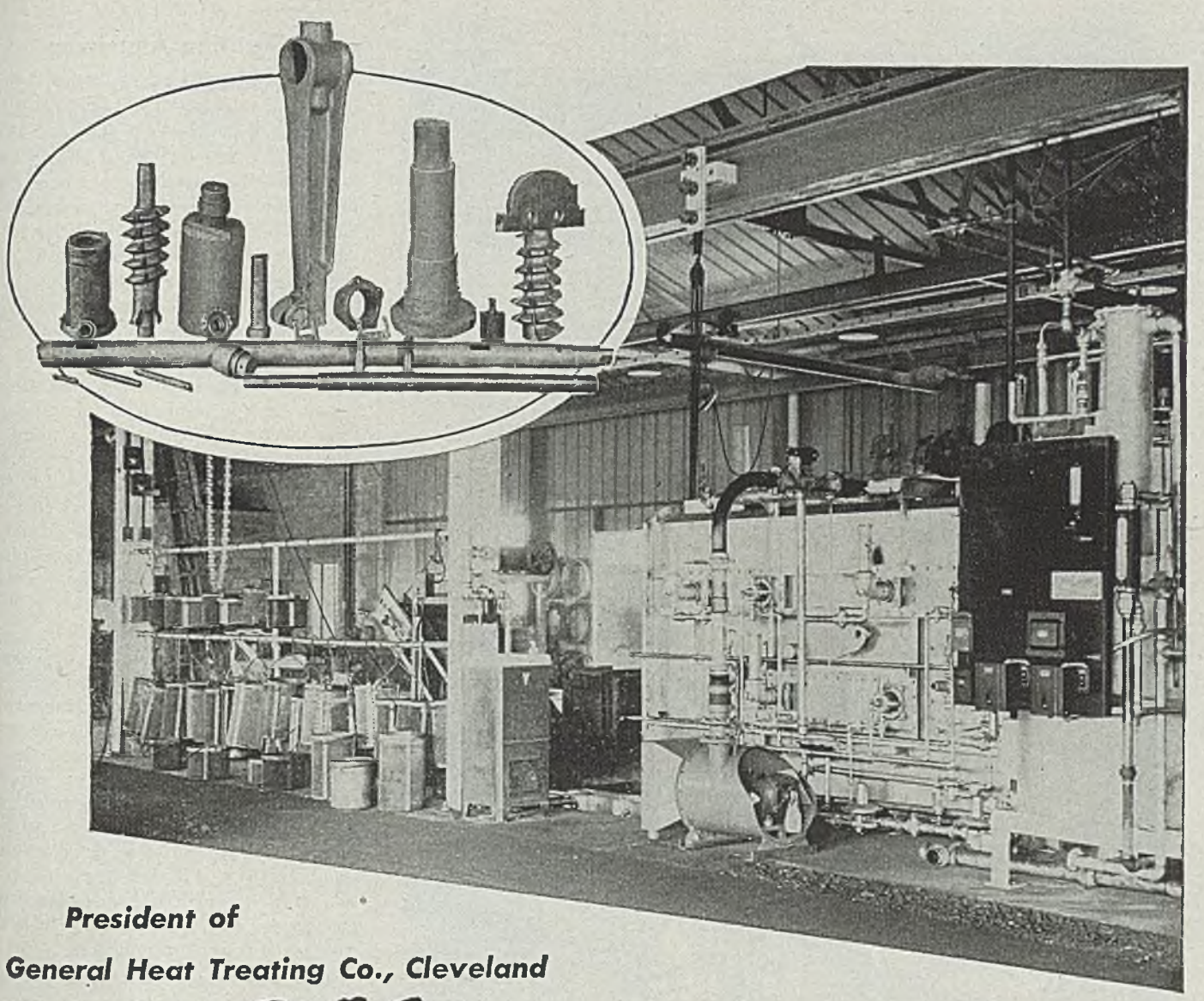
base and round flat steel top on which revolves a disk on which the materials being conveyed rest.

Disk is motor driven auomatically at any desired speed in order to synchronize perfectly with the speed of conveyor. Around the outer edge of the disk top is a guard plate which prevents the contents of the disk from falling off.
Steel 9/16/46; *Item No.* 9551

Micrometer Valves

Microl valves which use a basically new principle to obtain precise and continuous control of flow of either liquids or gases are latest developments of Standard Instruments Co., South Boston 27, Mass. Flow control in each valve is provided by moving adjustable plunger which varies length of capillary passage continuously from 4 to 600 in.

Flow of air and other gases may be varied over range of 0.2 to 60 cu in. per minute with a pressure drop across each valve of 15 psi, flow of water and other light liquids can be varied from 0.04 cc to 10 cc per minute.
Steel 9/[illegible] *Item No.* 9498



President of

General Heat Treating Co., Cleveland

says

GAS "does a better job"

in his 26 heat treating furnaces

Mr. Joseph Sindelar, President of the busy and progressive General Heat Treating Company of Cleveland, finds Gas and Gas equipment do a better job in meeting the exacting specifications required by his customers. All manner of metal parts including high speed steel, dies, broaches, tool steels, springs, bolts and engine parts pass through the Company's 26 Gas furnaces for a wide variety of heat processing.

Mr. Sindelar believes that Gas furnaces enable him to turn out work of the highest quality. He finds Gas fuel speedier, most accurately controllable for precise temperatures and finds Gas is unsurpassed for flexibility—an important factor in custom heat treating—where wide variation in size, type of product and heat treatment necessary, is encountered.

Whether you operate an independent heat treating establishment or whether heat treating is an integral operation in your production line, Gas is your recommended fuel for securing any desired characteristic in metals—and for doing it faster and more economically. The Industrial Engineer of your local Gas Company will gladly help you achieve these objectives.

American Gas Association

420 Lexington Avenue, New York 17, N.Y.

MORE AND MORE...

THE TREND IS TO GAS

FOR ALL INDUSTRIAL HEATING

Heat Treating Aluminum

(*Continued from Page* 106)

normal atmosphere. Radiant tube furnaces, employing oil or gas, can also be employed when a normal atmosphere is desired. For applications where the products of combustion are acceptable, gas or oil-fired forced air circulating furnaces are usually more economical.

It is advantageous to have the quenching tank immediately under the heating chambers to facilitate the quenching operation when using an air furnace.

Salt Bath Furnaces: There are many salt mixtures in commercial use, ranging from commercial fertilizer to a mixture of equal parts of sodium and potassium nitrates. A popular mixture consists of 90 per cent sodium nitrate and 10 per cent sodium nitrite, the nitrite addition lowering the melting point of the mixture several degrees. All salt mixtures should be inhibited with a small amount of dichromate.

Salt baths may be heated by either gas or electricity, the more common fuels being gas and oil. With these fuels, the control of the heat input can be closely and quickly controlled. Since there is danger of fire, proper selection of fuel is of prime importance. Operation of salt baths is rather critical so the instructions furnished by the manufacturer should be strictly followed. If the installation of a salt bath is contemplated, it is suggested that full details be obtained from major furnace manufacturers.

Cold water quenching tanks should be so located that the load can be transferred from the furnace into the water with a minimum of elapsed time. The maximum lapse of time for the dural-type alloys should not be greater than 10 sec. Two tanks must be used to remove the salt from the material.

Temperature Control: Good temperature control is a necessity to produce consistently superior quality meterial. Tolerance ranges should be ±5° F for precipitation heat treatment, ±10° for solution heat treatment, ±12.5 to 15° for annealing. Sufficient pyrometric equipment should be employed to insure adherence to the temperature requirements set forth in Tables I and II.

Both the minimum and maximum temperature must be controlled. Thermocouples should be located in the work at both the hot and cold spots. These spots can be determined by furnace temperature or load temperature surveys with the furnace loaded in a normal manner. The thermal head of the heating medium must be kept sufficiently low to prevent localized overheating. Maximum permissible head should be determined by survey.

Attention is called to the fact that a

substantial portion of the difficulties encountered in heat treating aluminum alloys is due to improper or inadequate temperature control. This fact is well worth remembering. When any difficulties arise, it should be the first point checked.

Note: In the August 26 issue, Fig. 12, p. 79, that portion of curve appearing on the equilibrium diagram from 1214.6° F to 5.5 per cent copper at 1918° F was identified as "curve." It should read "curve B."

Novel Assembly Fixture

(*Concluded from Page* 120)

next places one of the plastic caps over the head of the plug M, locating it with the projections N and with the hole in the cap facing upward.

He next brings the lever P upward and this raises the pusher Q against the cap forcing it back to the face of the column. This action brings the push slide in the keyway against the stop pin and pushes the nut out into the molded slot in the plastic cap.

The operator next feeds down the screw driver guide slide with the machine and before the screw driver comes to the hole in the plastic cap he places one of the screws in the chute K which carries the screw into the hole in the cap. The screw driver is then fed down onto this screw and the nut and screw are assembled.

To remove the part, the handle of the lever P is pushed down and the pusher Q returns to the lower position; the spring at the rear of the locating plug forces out the plug and assembled plastic cap which can then be removed. The fixture is giving good service and has made this operation a quick and low cost production job.

Open-Hearth Program Deals With Shop Problems

Experience of three companies to date with basic end and roof construction will be related at the joint meeting of the Southern Ohio Section of the National Open Hearth Committee, and the Ohio Valley Section of A.I.M.E., to be held at the Deshler-Wallick Hotel, Columbus, O., Oct. 25-26.

Major Hamilton Long will speak on "Will America Permit Peace?" at the joint dinner meeting Friday evening. Plant visitations are scheduled for Saturday morning and the Ohio State-Minnesota football game for the afternoon. C. R. FonDersmith, superintendent of Steel Production, American Rolling Mill Co., Middletown, O., is chairman of the Southern Ohio Section of the National Open Hearth Committee.

Testing Forgings

(*Concluded from Page 98*)

ring is taken from the testing ring and cleaned. At this time a very careful visual examination of the rough machined forging is made and it is sometimes necessary to reject the forging because of surface cracks even though the other checks on yield strength and elastic limit have been satisfactory. The pressure test data and the test bar data do not always agree and occasionally a forging with good physicals on the test bar is rejected because the pressure test shows unsatisfactory results.

After the pressure test the cylindrical forgings are finish machined to become the rotor coil retaining rings. After this final machining the forging surfaces are again given careful inspection as an added check before assembly on the rotor.

It has been found very desirable to overload machine parts beyond the stress they will be subjected to in service before the final machining on the parts, since the designer then knows that in service the part will not expand and change its shape or will fail by being overstressed. In particular, on designs where a few thousandths of an inch expansion would throw the parts out of adjustment, prestressing is very important. On designs where calculated stress are high, this check on the properties is essential.

While the method presented here makes use of one particular shape, the thin walled cylinder, the principle brought out can be applied in innumerable cases.

While we have referred to these cylinders as thin walled they could be classed as thick walled from a stress calculation standpoint since the thickness of the cylinder is more than one tenth of the radius of the cylinder. The formula given is only applicable when the wall thickness is more than about one-tenth of the radius.

Crimped Wire Connection Withstands Vibration

Installation tools and terminals for attaching solderless connections to solid or stranded wire of sizes 22 to 10 have been developed by Aircraft-Marine Products Inc., Harrisburg, Pa. The mechanical connection made by the crimping operation will withstand vibration and torsional twist, the company states.

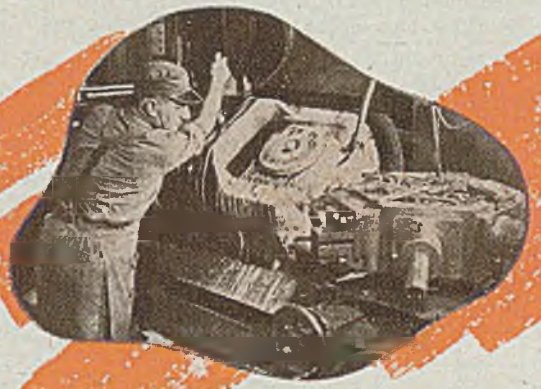
The crimp for solid wire is such that no air space exists inside the terminal, said to make full surface area contact with the conductor. Terminals used in this application are electro-tinned copper, gives maximum electrical conductivity.

Terminals have short barrel and when crimped do not spread. Shape locates solid conductor in a central position in terminal barrel, according to the company.

Here's one place radiography more than pays its way . . .

IN FOUNDRY OPERATIONS: no need to spend a lot of time and money testing the practicality of new casting designs . . . the soundness and safety of proposed weight reduction . . . the correctness of foundry technics. With radiography you can quickly correct unsound practices . . . save enough thereby to more than pay for the radiographs used.

Here's another . .



IN MACHINING: it's big money lost when parts with internal defects aren't discovered until after machining starts. Using x-ray, you can screen out all but an irreducible minimum of such faulty castings *before* machining . . . never miss what you pay out for x-rays because of what you get back in time and labor savings.

And another . .

IN WELDING: altogether too many castings are scrapped because of defects that skillful welding would repair. With radiographic guidance for your welders, you can make sound weld repairs that can be depended upon. This will enable you to minimize rejections . . . effect savings in material costs that will make your radiography outlay look insignificant.

For more information about the efficiencies and economies you can achieve with radiography, call in your local x-ray dealer. Or write . . .

EASTMAN KODAK COMPANY • X-ray Division • ROCHESTER 4, N. Y.

Radiography . . . another important function of photography

Kodak

The Business Trend

Production Recovering From Holiday Decline

RECOVERY from its slackened pace of the Labor Day week is being made by industrial production, which, as a result of the holiday, fell in the week ended Sept. 7 to the lowest point since two months ago.

Reflecting the holiday influence, STEEL's industrial production index for the week ended Sept. 7 dropped to 137 per cent (preliminary), compared with 149 per cent in the previous week. The 137 per cent level is the lowest since the 126 per cent recorded in the Fourth of July holiday week. Highest postwar pace had been set in the weeks ended Aug. 17 and 24 when the index was 152 per cent.

AUTOS—Helping industrial production as a whole to return to its pre-Labor Day tempo is automobile production, which in the week ended Sept. 15 was expected to attain a new postwar high of approximately 95,000 passenger cars and trucks. The postwar high had been 91,360 assembled in the week ended Aug. 24. During the Labor Day week, auto output dropped to 76,106.

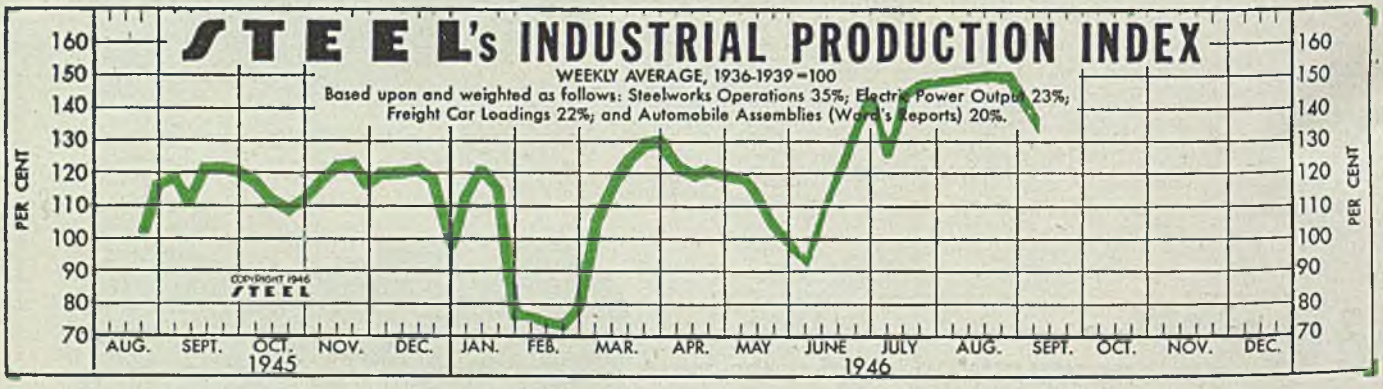
STEEL—Also giving strength currently to the recovery of industrial production is steel ingot output. It had fallen during the week ended Sept. 7 because of the Labor Day holiday and the scrap shortage. However, the latter still plagues the industry in its efforts to maintain a high rate of production.

CARLOADINGS—Railroad carloadings which declined during the Labor Day week probably will not rebound upward as sharply as they would had the American Federation of Labor merchant seamen's strike not brought on an embargo of rail shipments to seaports. Also affecting carloadings was the truck drivers' strike which was paralyzing commerce and industry in New York city.

STOCKS—Wall Street is still seeking a satisfactory explanation as to why the stock market has been hit by a selling wave which has knocked the Dow-Jones industrial stock average down approximately 20 per cent from the 1946 high mark registered at the end of May. While some observers attribute the break to labor unrest, price control, and foreign affairs, other market analysts believe the decline stems from the saturation of investment and speculative buying power.

PRICES—First decline since the week ended July 27 was registered during the week ended Aug. 31 in the U. S. Bureau of Labor Statistics wholesale price index. Latest level of the index is 128.2 per cent of the 1926 average of 100. This is a decline of 0.2 of a point from the week ended Aug. 24 and is a result principally of a slight decrease in average prices of farm products.

COAL—Production of bituminous coal continued at a high rate during the week ended Aug. 31, when output was estimated at 12,500,000 tons, and helped further to reduce the deficit incurred during the miners' strike early this year. Output this year through Aug. 31 had come within 53,374,000 tons, or 13.5 per cent, of production for the corresponding period in 1945.



The Index (see chart above): Latest Week (preliminary) 137 Previous Week 149 Month Ago 150

FIGURES THIS WEEK

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)§	83.3	90	89	73.5
Electric Power Distributed (million kilowatt hours)	4,184	4,404	4,412	3,909
Bituminous Coal Production (daily av.—1000 tons)	2,083	2,036	2,012	2,042
Petroleum Production (daily av.—1000 bbls.)	4,800	4,833	4,821	4,518
Construction Volume (ENR—Unit $1,000,000)	$86.1	$79.9	$119.6	$30.8
Automobile and Truck Output (Ward's—number units)	76,106	71,960	77,825	14,210

*Dates on request. §1946 weekly capacity is 1,762,381 net tons. 1945 weekly capacity was 1,831,636 net tons.

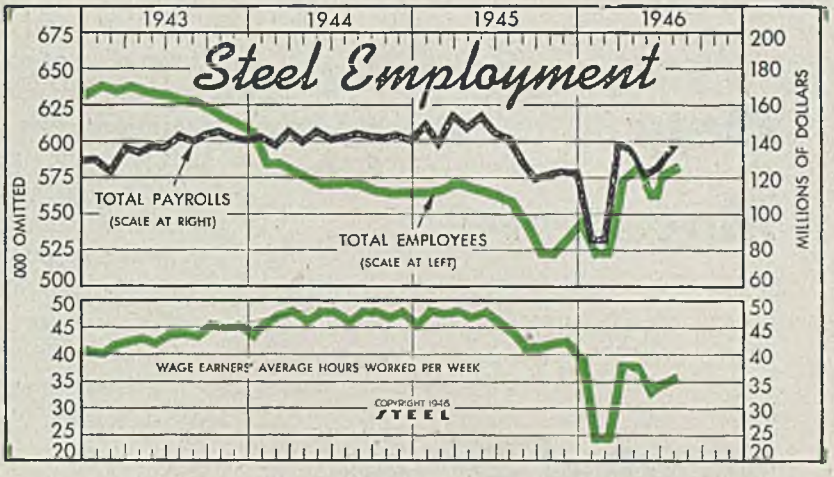
TRADE				
Freight Carloadings (unit—1000 cars)	725†	908	899	731
Business Failures (Dun & Bradstreet, number)	14	28	27	19
Money in Circulation (in millions of dollars)‡	$28,306	$28,376	$28,326	$27,750
Department Store Sales (change from like wk. a yr. ago)‡	+45%	+40%	+30%	0

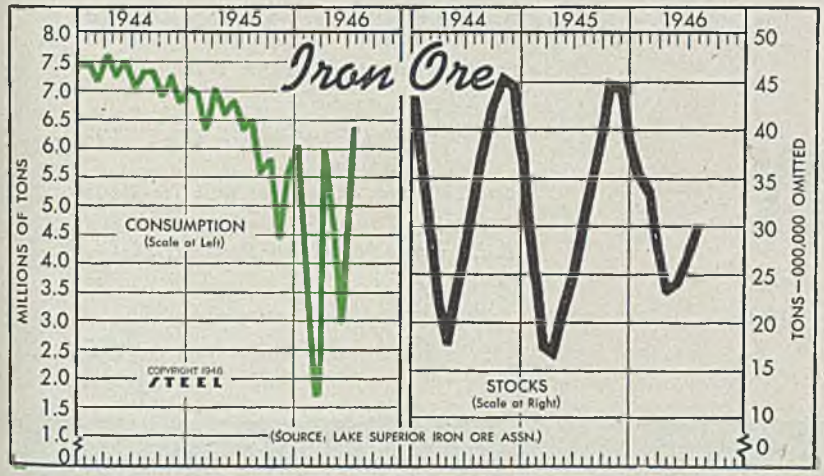
†Preliminary. ‡Federal Reserve Board.

Steel Employment

	—Employees†— (000 omitted)			—Total Payrolls— (Unit—$1,000,000)		
	1946	1945	1944†	1946	1945	1944
Jan.*	522	564	583	$84.9	$150.3	$141.8
Feb.*	522	566	583	84.9	138.4	137.6
Mar.	570	570	578	138.8	155.0	145.3
April	582	567	573	134.3	147.0	138.9
May	563	565	569	121.4	154.0	145.4
June	578	562	570	125.6	144.1	140.5
July	585	557	571	138.0	141.0	141.8
Aug.	....	548	569	....	128.1	143.9
Sept.	....	521	565	....	119.1	142.2
Oct.	....	522	564	....	121.3	141.7
Nov.	....	533	564	....	122.8	143.1
Dec.	....	545	564	....	122.5	139.9

† Monthly average. * Figures for January and February, 1946, are merely averages derived from a report that combined those two strike-affected months.





Iron Ore

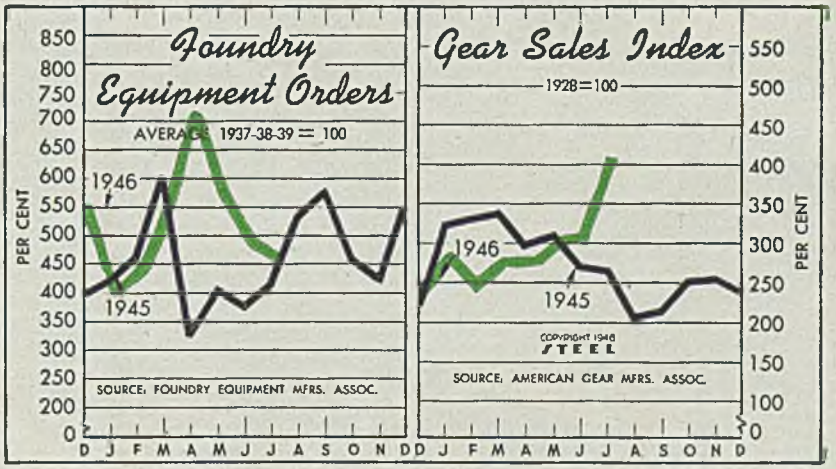
(Lake Superior Iron Ore Assn.)

Gross tons—000 omitted

	Consumption		Stocks at Lake Erie Docks and furnaces	
	1946	1945	1946	1945
Jan.	3,719	6,983	35,312	30,889
Feb.	1,748	6,371	33,617	24,577
Mar.	6,021	7,082	27,601	17,304
Apr.	4,769	6,642	23,079	16,429
May	2,990	6,872	23,905	20,715
June	4,995	6,397	26,265	24,847
July	6,423	6,532	30,439	29,485
Aug.	....	5,658	.....	34,781
Sept.	....	5,837	.....	39,549
Oct.	....	4,491	.....	45,040
Nov.	....	5,611	.....	44,706
Dec.	....	6,099	.....	39,059
Total	....	74,576	.....	.....

Foundry Equipment Orders — Gear Sales

	Foundry Equipment Orders —Index (1937-38-39=100)—			Gear Sales —Index (1928=100)—		
	1946	1945	1944	1946	1945	1944
Jan.	392.8	422.4	378.3	269	323	246
Feb.	432.8	465.3	456.8	253	331	214
Mar.	536.6	601.7	498.4	275	339	485
Apr.	701.2	325.0	385.7	284	296	308
May	577.3	401.7	503.9	313	309	305
June	491.7	375.4	466.1	321	271	328
July	458.4	411.7	375.8	407	264	242
Aug.	....	532.2	450.5	...	205	247
Sept.	....	577.2	388.0	...	213	248
Oct.	....	457.8	526.5	...	251	293
Nov.	....	416.6	369.5	...	255	209
Dec.	....	547.6	397.4	...	239	219
Ave.	....	461.7	433.1	...	275	279



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$10,053	$11,074	$11,791	$8,177
Federal Gross Debt (billions)	$266.0	$267.8	$267.5	$263.2
Bond Volume, NYSE (millions)	$28.1	$20.7	$15.6	$30.6
Stocks Sales, NYSE (thousands)	10,559	6,875	4,102	5,111
Loans and Investments (billions)†	$60.0	$60.0	$60.7	$62.5
United States Gov't. Obligations Held (millions)†	$41,463	$41,571	$42,296	$46,371

†Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$64.45	$64.45	$64.45	$58.27
All Commodities†	128.2	128.4	125.0	105.2
Industrial Raw Materials†	142.6	144.9	140.6	115.8
Manufactured Products†	124.5	123.6	120.6	102.1

†Bureau of Labor Statistics Index, 1926 = 100.

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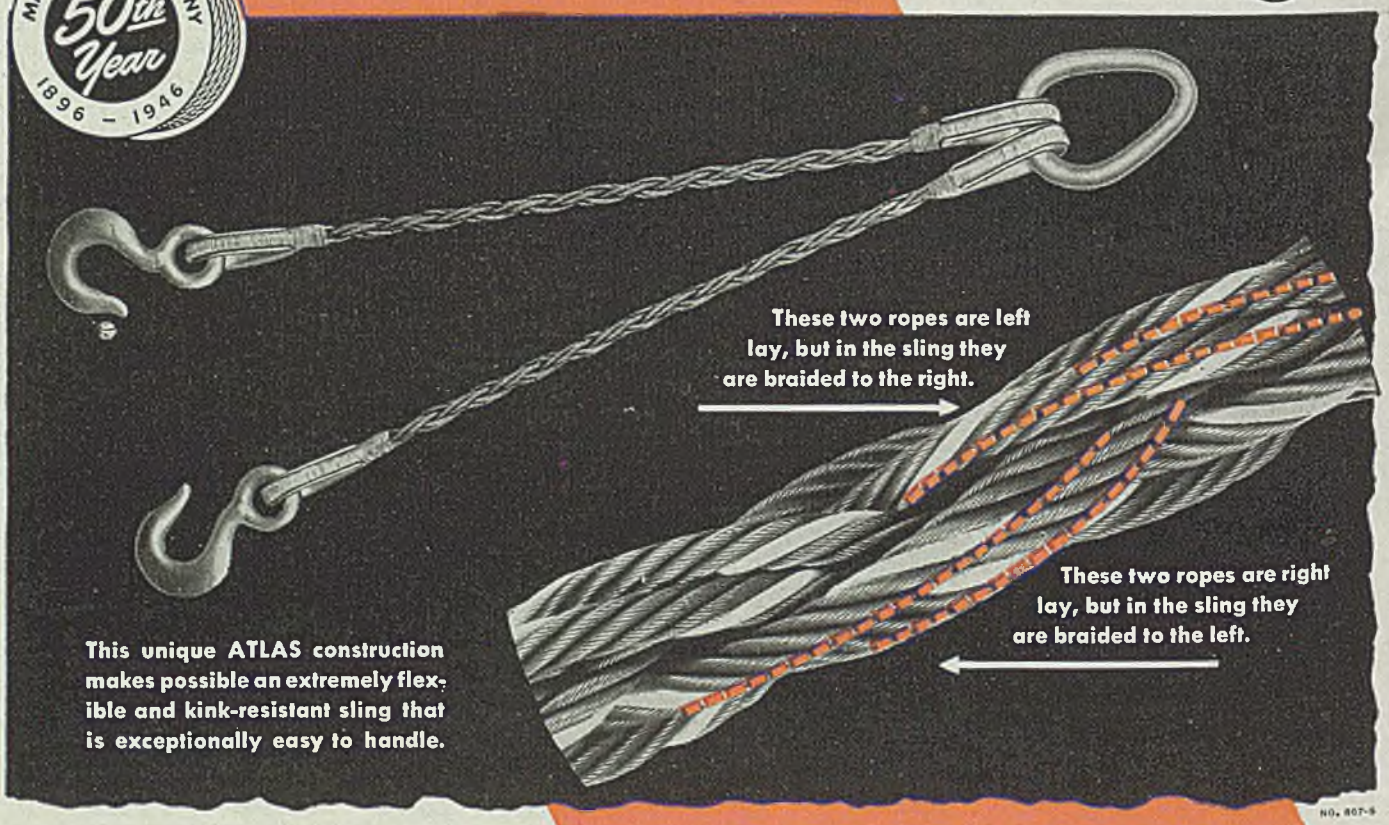

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OPA-CPA Action on Scrap Fails To Solve Problem

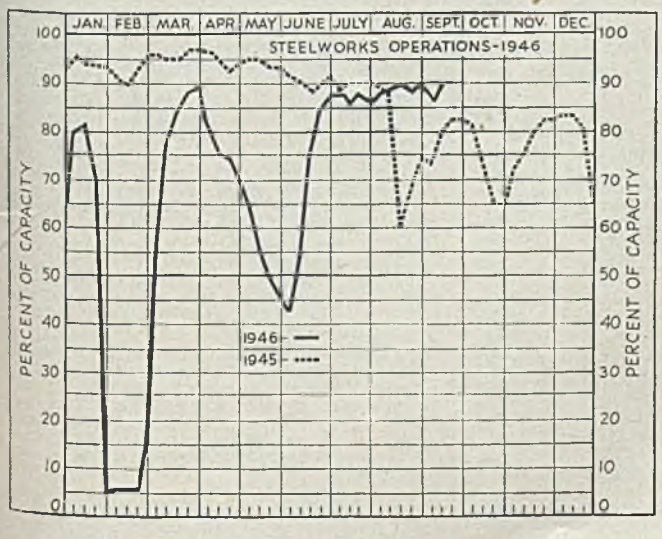
Denial of general price increase is distinctly disappointing to scrap dealers and steel producers. Inventory controls held meaningless

JOINT action of the Office of Price Administration and Civilian Production Administration last week denying a general price increase in scrap and establishing new inventory, trading and consumption restrictions failed dismally, in the opinion of a majority of scrap sellers and consumers, to solve the supply problem. Decision to hold prices, except on cast grades, for at least six months at present levels is not expected to stimulate shipments and, hence, leaves most furnaces in a precarious position so far as this vital raw material is concerned.

There is considerable apprehension as to how long steel ingot production can be maintained at the present high level without a substantial increase in scrap supplies. Unless that production level is maintained, finishing mills cannot hope to make any appreciable headway in reducing their heavy order backlogs for all types of products.

In this action, prices on all grades, except cast, were left unchanged at levels established as being "fair and equitable" in April, 1941, more than five years ago. With the question of prices presumably settled for at least six months, there may be a temporary loosening up of scrap in some quarters, but this is expected to be short-lived. Some of the new restrictions may bring better order to such trading as may be done and eliminate upgrading in important instances, but on the other hand inventory controls appear meaningless to many in the trade under the conditions which now exist and are likely to continue for a considerable time.

Nor will price increases in cast scrap mean much to the steel mills, although they may relieve a little of the pressure on pig iron, with some foundry iron production being diverted to basic, but even that is problematical at the moment. In view of the extreme shortage of cast scrap, there is question if the announced advances will have extended effect on the movement of this material to foundries.



DISTRICT STEEL RATES

(Percentage of Ingot Capacity Engaged in Leading Districts)

	Week Ended Sept. 14	Change	Same Week 1945	Same Week 1944
Pittsburgh	97.5	— 0.5	73.5	88.5
Chicago	90	+15.5	83.5	100
Eastern Pa.	80	None	75	95
Youngstown	89	None	85	88
Wheeling	93.5	+12	95	96
Cleveland	88	None	83	93
Buffalo	90.5	None	81.5	90.5
Birmingham	99	None	95	95
New England	86	+ 2	78	92
Cincinnati	83	None	76	87
St. Louis	70	+ 7	68	87
Detroit	86	— 5	89	89
Estimated national rate	89.5	+ 4	80.5	96

Based on weekly steelmaking capacity of 1,762,381 net tons for 1946; 1,831,636 tons for 1945; 1,791,287 tons for 1944.

Finished steel product producers have commitments on their books well in excess of their ability to fill under present conditions and were, therefore, deeply concerned that the government did not take action which would assure maintenance of steel production at current levels. With rated orders still pouring in, sheet and strip producers are falling farther behind in meeting 1946 demands. So pressing are the requirements for the housing program in particular, some sheet mills have nothing to offer to their regular customers for the final quarter, except that which can be applied against ratings. A number of producers not already in that position fear they will be before long. All of which means that the carryover into next year may be even greater than previously contemplated.

The position in bars, shapes and plates is not much better, despite the fact that ratings are a lesser factor. Producers of these items all have commitments on their books well in excess of their ability to produce.

A new postwar production record was established by the steel industry last month at 6,895,465 net tons compared with 6,609,668 tons in July, the previous high, and 5,735,317 in August, 1945. American Iron & Steel Institute reported operations at 88.3 per cent of capacity compared with 84.9 per cent in July and 70.7 per cent in August of last year.

Steel production increased four points last week to 89½ per cent of capacity. Advances were recorded as follows: 15½ points to 90 per cent at Chicago, 12 points to 93½ per cent at Wheeling, 7 points to 70 per cent at St. Louis, and 2 points to 86 per cent in New England. The rate dropped 5 points to 86 per cent at Detroit, ½ point to 97½ per cent at Pittsburgh and held unchanged elsewhere.

COMPOSITE MARKET AVERAGES

	Sept. 14	Sept. 7	Aug. 31	One Month Ago Aug., 1946	Three Months Ago June, 1946	One Year Ago Sept., 1945	Five Years Ago Sept., 1941
Finished Steel	$64.45	$64.45	$64.45	$64.45	$64.09	$58.27	$56.73
Semifinished Steel	40.60	40.60	40.60	40.60	40.60	37.80	36.00
Steelmaking Pig Iron	27.50	27.50	27.50	27.50	27.50	24.00	23.00
Steelmaking Scrap	19.17	19.17	19.17	19.17	19.17	19.17	19.17

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others, dollars per gross ton.

Finished Material

	Sept. 14, 1946	Aug., 1946	June, 1946	Sept., 1945
Steel bars, Pittsburgh	2.50c	2.50c	2.50c	2.25c
Steel bars, Philadelphia	2.86	2.86	2.82	2.57
Steel bars, Chicago	2.50	2.50	2.50	2.25
Shapes, Pittsburgh	2.25	2.35	2.35	2.10
Shapes, Philadelphia	2.48	2.48	2.465	2.215
Shapes, Chicago	2.35	2.35	2.35	2.10
Plates, Pittsburgh	2.50	2.50	2.50	2.25
Plates, Philadelphia	2.558	2.558	2.55	2.30
Plates, Chicago	2.50	2.50	2.50	2.25
Sheets, hot rolled, Pittsburgh	2.425	2.425	2.425	2.20
Sheets, cold-rolled, Pittsburgh	3.275	3.275	3.275	3.05
Sheets, No. 24 galv., Pittsburgh	4.05	4.05	4.05	3.70
Sheets, hot-rolled, Gary	2.425	2.425	2.425	2.20
Sheets, cold-rolled, Gary	3.275	3.275	3.275	3.05
Sheets, No. 24 galv., Gary	4.05	4.05	4.05	3.70
Hot-rolled strip, over 6 to 12-in., Pitts.	2.35	2.35	2.35	2.10
Cold-rolled strip, Pittsburgh	3.05	3.05	3.05	2.80
Bright basic, bess. wire, Pittsburgh	3.05	3.05	3.05	2.75
Wire nails, Pittsburgh	3.75	3.55	3.25	2.90
Tin plate, per base box, Pittsburgh	$5.25	$5.25	$5.25	$5.00

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$38.00	$38.00	$38.00	$36.00
Slabs, Pittsburgh, Chicago	39.00	39.00	39.00	36.00
Rerolling billets, Pittsburgh	39.00	39.00	39.00	36.00
Wire rods, No. 5 to 5/8-inch, Pitts.	2.30c	2.30c	2.30c	2.15c

Pig Iron

	Sept. 14, 1946	Aug., 1946	*June, 1946	Sept., 1945
Bessemer del. Pittsburgh	$29.77	$29.77	$27.69	$26.19
Basic, Valley	28.00	28.00	26.00	24.50
Basic, eastern del. Philadelphia	29.93	29.93	27.84	26.34
No. 2 fdry., del. Pgh. N. & S. sides	29.27	29.27	27.19	25.69
No. 2 foundry, Chicago	28.50	28.50	26.50	25.00
Southern No. 2, Birmingham	24.88	24.88	22.88	21.38
Southern No. 2, del. Cincinnati	28.94	28.94	26.94	25.44
No. 2 fdry., del. Philadelphia	30.43	30.43	28.34	26.84
Malleable, Valley	28.50	28.50	26.50	25.00
Malleable, Chicago	28.50	28.50	26.50	25.00
Charcoal, low phos., fob Lyles, Tenn.	33.00	33.00	33.00	33.00
Gray forge, del. McKees Rocks, Pa.	28.61	28.61	28.55	25.05
Ferromanganese, fob cars, Pittsburgh	140.00	140.00	140.00	140.33

Scrap

Heavy melting steel, No. 1, Pittsburgh	$20.00	$20.00	$20.00	$20.00
Heavy melt, steel, No. 2, E. Pa.	18.75	18.75	18.75	18.75
Heavy melting steel, Chicago	18.75	18.75	18.75	18.75
Rails for rolling, Chicago	22.25	22.25	22.25	22.25
No. 1 cast, Chicago	25.00	20.00	20.00	20.00

Coke

Connellsville, furnace ovens	$8.75	$8.75	$8.75	$7.50
Connellsville, foundry ovens	9.50	9.50	9 50	8.25
Chicago, by-product fdry., del.	15.10	15.10	13.75	13.75

* $2 higher on bessemer, basic, foundry and malleable on adjustable pricing contracts.

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Delivered prices do not include the 3 per cent federal tax on freight. Pricing on rails was changed to net ton basis as of Feb. 15, 1946.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, $33, fob mill; forging quality, $38, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, Coatesville, uncrop, $48.69.

Rerolling, Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, $39; Detroit, del., $41; Duluth (billets), $41; Pac. ports (billets), $51. (Andrews Steel Co., carbon slabs, $41; Northwestern Steel & Wire Co., $41, Sterling, Ill.; Granite City Steel Co., $47.50 gross ton slabs from D.P.C. mill. Geneva Steel Co., $58.64, Pas. ports.)

Forging Quality Blooms, Slabs, Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $47; Detroit, del., $49; Duluth, billets, $49; forging billets fob Pac. ports, $59.

(Andrews Steel Co. may quote carbon forging billets $5C gross ton at established basing points; Follansbee Steel Corp., $49.50 fob Toronto, O.; Geneva Steel Co., $64.64, Pacific ports.)

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $58.43; del. Detroit $60.43; eastern Mich. $61.43.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $38. (Empire Sheet & Tin Plate Co., Mansfield, O., carbon sheet bars, $39, fob mill.)

Skelp: Pittsburgh, Chicago, Sparrows Point, Youngstown, Coatesville, lb, 2.05c.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, No. 5—3/8 in. inclusive, per 100 lb, $2.30. Do., over 3/8—47/64-in., incl., $2.45; Galveston, base, $2.40 and $2.55, respectively. Worcester add $0.10; Pacific ports $0.50.

Bars

Hot-Rolled Carbon Bars and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham base, 20 tons one size, 2.50c; Duluth, base, 2.60c; Detroit, del., 2.60c; eastern Mich., 2.65c; New York, del., 2.86c; Phila., del., 2.86c; Gulf ports, dock, 2.85c; Pac., ports, dock, 3.15c. (Sheffield Steel Corp. may quote 2.75c, fob St. Louis; Joslyn Mfg. & Supply Co., 2.55c. fob Chicago.)

Rail Steel Bars: Same prices as for hot-rolled carbon cars except base is 5 tons.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 2.921c; Detroit, del., 3.021c. (Texas Steel Co. may use Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

AISI Series	(*Basic O-H)	AISI Series	(*Basic O-H)
1300	$0.108	4300	$1.839
2300	1.839	4600	1.298
2500	2.759	4800	2.326
3000	0.541	5100	0.379
3100	0.920	5130 or 5152	0.494
3200	1.461	6120 or 6152	1.028
3400	3.462	6145 or 6150	1.298
4000	0.487	8612	0.703
4100 (.15-.25 Mo)	0.757	8720	0.757
(.20-.30 Mo)	0.812	9830	1.407

* Add 0.25 for acid open-hearth; 0.50 electric.

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 20,000-39,999 lb, 3.10c; Detroit, 3.15c; Toledo, 3.25c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 3.625c; Detroit, del., 3.725c, eastern Mich.; 3.755c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.35c; Detroit, del., 2.45c; eastern Mich. and Toledo, 2.50c; Gulf ports, dock, 2.70c; Pacific ports, dock, 2.75c.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo, base, 2.35c; Detroit, del., 2.45c; eastern Mich. and Toledo, del., 2.50c; Gulf ports, dock, 2.70c.

Iron Bars: Single refined, Pitts., 4.76c; double refined, 5.84c; Pittsburgh, staybolt, 6.22c; Terre Haute, single ref., 5.42c; double ref., 6.76c.

Sheets, Strip

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Pt., Middletown, base, 2.425c; Granite City, base, 2.525c; Detroit, del., 2.525c; eastern Mich., del., 2.575c; Phila., del., 2.615c; New York, del., 2.685c; Pacific ports, 2.975c. (Andrews Steel Co. may quote hot-rolled sheets for shipment to the Detroit area on the Middletown, O., base; Alan Wood Steel Co., Conshohocken, Pa., may quote 3.00c on hot carbon sheets, Sparrows Point, Md.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.275c; Granite City, base, 3.375c; Detroit, del., 3.375c; eastern Mich., del., 3.425c; New York, del., 3.615c; Phila., del., 3.635c; pacific ports, 3.925c.

Galvanized Sheets, No. 24: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base, 4.05c; Granite City, base, 4.15c; New York, del., 4.31c; Phila., del., 4.24c; Pacific ports, 4.60c.

Corrugated Galv. Sheets: Pittsburgh, Chicago, Gary, Birmingham, 29-gage, per square, 3.73c.

Culvert Sheets: Pittsburgh, Chicago, Gary, Birmingham, 16-gage not corrugated, copper alloy, 4.15c; Granite City, 4.25c; Pacific ports, 4.60c; copper iron, 4.50c; pure iron, 4.50c; zinc-coated, hot-dipped, heat-treated, No. 24. Pittsburgh, 4.60c.

Aluminized Sheets, 20 gage: Pittsburgh, hot-dipped, coils or cut to lengths 9.00c.

Enameling Sheets: 10-gage; Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base 3.20c; Granite City, base 3.30c; Detroit, del., 3.30c; eastern Mich., 3.35c; Pacific ports, 3.85c; 20-gage: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base, 3.80c; Detroit, del., 3.90c; eastern Mich., 3.95c; Pacific ports, 4.45c.

Electrical Sheets No. 24:

	Pittsburgh Base	Pacific Ports	Granite City
Field grade	3.90c	4.65c	4.00c
Armature	4.25c	5.00c	4.35c
Electrical	4.75c	5.50c	4.85c
Motor	5.425c	6.175c	5.525c
Dynamo	6.125c	6.875c	6.225c
Transformer			
72	6.625c	7.375c	.....
65	7.625c	8.375c	.....
58	8.125c	8.875c	.....
52	8.925c	9.675c	.....

Hot-Rolled Strip: Pittsburgh, Chicago, Gary Cleveland, Birmingham, Youngstown, Middletown, 6-in. and narrower: Base, 2.45c; Detroit, del., 2.55c; eastern Mich., del., 2.60c; Pacific ports, 3.10c. (Superior Steel Corp. may quote 3.30c, Pitts.)

Over 6-in.: Base, 2.35c; Detroit, del., 2.45c; eastern Mich., del., 2.50c; Pacific ports, 3.00c. (Superior Steel Corp. may quote 3.20c, Pitts.)

Cold-Rolled Strip: Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less, 3.05c; Chicago, base, 3.15c; Detroit, del., 3.15c; eastern Mich., del., 3.20c; Worcester, base, 3.25c. (Superior Steel Corp. may quote 4.70c, Pitts.)

Cold-Finished Spring Steel: Pittsburgh, Cleveland base, 0.26-0.50 carbon, 3.03c. Add 0.20c for Worcester.

Tin, Terne Plate

(OPA ceiling prices announced March 1, 1946.)

Tin Plate: Pittsburgh, Chicago, Gary, 100-lb base box, $5.25; Granite City, Birmingham, Sparrows Point, $5.35.

Electrolytic Tin Plate: Pittsburgh, Gary, 100-lb base box 0.25 lb tin, $4.60; 0.50 lb tin, $4.75; 0.75 lb tin, $4.90; Granite City, Birmingham, Sparrows Point, $4.70, $4.85, $5.00, respectively.

Tin Mill Black Plate: Pittsburgh, Chicago, Gary, base 29-gage and lighter, 3.30c; Granite City, Birmingham, Sparrows Point, 3.40c; Pacific ports, boxed, 4.30c.

Long Ternes: Pittsburgh, Chicago, Gary, No. 24 unassorted, 4.05c; Pacific ports, 4.80c.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, 100-base box, $4.55; Granite City, Birmingham, Sparrows Point, $4.65.

Roofing Ternes: Pittsburgh base per package 112 sheets; 20 x 28 in., coating I. C, 8-lb $12.50; 15-lb $14.50; 20-lb $15.50 (nom.); 40-lb $20.00 (nom.).

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, Coatesville, Claymont, 2.50c; New York, del., 2.71c; Phila., del., 2.558c; St. Louis, 2.74c; Boston, del., 2.86c; Pacific ports, 3.05c; Gulf ports, 2.85c.

(Granite City Steel Co. may quote carbon plates 2.65c fob DPC mill; Geneva Steel Co., Provo, Utah, 3.20c fob Pac. ports; Central Iron & Steel Co., Harrisburg, Pa., 2.80c, basing points; Lukens Steel Co., Coatesville, Pa., 2.75c, base; Worth Steel Co., Claymont, Del., 2.60c, base; Alan Wood Steel Co., Conshohocken, Pa., 2.75c base.)

Floor Plates: Pittsburgh, Chicago, 3.75c; Pacific ports, 4.40c; Gulf ports, 4.10c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, Coatesville, 3.787c; Gulf ports, 4.273c; Pacific ports, 4.49c.

Clad Steel Plates: Coatesville, 10% cladding: nickel-clad, 18.72c; inconel-clad, 26.00c; monel-clad, 24.96c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.35c; New York, del., 2.54c; Phila., del., 2.48c; Pacific ports, 3.00c; Gulf ports, 2.70c.

(Phoenix Iron Co., Phoenixville, Pa., may quote the equivalent of 2.60c, Bethlehem, Pa., on the general range and 2.70c on beams and channels from 4 to 10 inches.)

Steel Piling: Pittsburgh, Chicago, Buffalo, 2.65c; Pacific ports, 3.20c.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham, per 100 pounds)

Wire to Manufacturers in carloads

Bright basic or bessemer	*$3.05
Spring (except Birmingham)	*$4.00

Wire Products to Trade

Nails and staples

Standard and cement-coated	†$3.75
Galvanized	‡$3.40

Wire, Merchant Quality

Annealed	§$3.50
Galvanized	§$3.85

(Fob Pittsburgh, Chicago, Cleveland, Birmingham, per base column)

Woven fence, 15½ gage and heavier	72
Barbed wire, 80-rod spool	**79
Barbless wire, twisted	**79
Fence posts	74
Bale ties, single loop	72½

*Add $0.10 for Worcester, $0.05 for Duluth and $0.50 for Pacific ports.

†Add $0.30 for Worcester, $0.50 for Pacific ports. Nichols Wire & Steel may quote $4.25; Pittsburgh Steel Co., $4.10.

‡Add $0.50 for Pacific ports.

§Add $0.10 for Worcester; $0.70 Pacific ports.

**Pittsburgh Steel Co. may quote 89.

Tubular Goods

Welded Pipe: Base price in carloads, threaded and coupled to consumers about $200 per net ton. Base discounts on steel pipe Pittsburgh and Lorain, O.; Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Pittsburgh base only on wrought iron pipe.

Butt Welded

In.	Steel Blk.	Steel Galv.	In.	Iron Blk.	Iron Galv.
⅛	53	30	½	21	0½
¼ & ⅜	56	37½	¾	27	7
½	60½	48	1-1¼	31	13
¾	63½	52	1½	35	15½
1-3	65½	54½	2	34½	15

Lap Weld

In.	Steel Blk.	Steel Galv.	In.	Iron Blk.	Iron Galv.
2	58	46½	1¼	20	0½
2½-3	61	49½	1½	25½	7
3½-6	63	51½	2	27½	9
7-8	62	49½	2½-3½	28½	11½
9-10	61½	49	4	30½	15
11-12	60½	48	4½-8	29½	14
			9-12	25½	9

Boiler Tubes: Net base prices per 100 feet fob Pittsburgh in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

O.D. sizes	B.W.G.	—Seamless— Hot Rolled	Cold Drawn	—Elec. Weld— Hot Rolled	Cold Rolled
1"	13	....	$9.90	$9.36	$9.65
1¼"	13	....	11.73	9.63	11.43
1½"	13	$10.91	12.96	10.63	12.64
1¾"	13	12.41	14.75	12.10	14.37
2"	13	13.90	16.52	13.53	16.19
2¼"	13	15.50	18.42	15.06	18.03
2¼"	12	17.07	20.28	16.57	19.83
2½"	12	18.70	22.21	18.11	21.68
2¾"	12	19.82	23.54	19.17	22.95
3"	12	20.79	24.71	20.05	24.02
3½"	11	26.24	31.18	25.30	30.29
4"	10	32.56	38.68	31.32	37.52
4½"	9	43.16	51.29	....	....
5"	9	49.96	59.36	....	....
6"	7	76.71	91.14	....	....

Pipe, Cast Iron: Class B. 6-in. and over, $60 per net ton, Birmingham; $65, Burlington, N. J.; $62.80, del., Chicago; 4-in. pipe, $5 higher. Class A pipe, $3 a ton over class B.

Rails, Supplies

Standard rails, over 60-lb. fob mill, net ton, $43.40. Light rails (billet), Pittsburgh, Chicago, Birmingham, net ton, $49.18.

Relaying rails, 35 lb and over, fob railroad and basing points, $31-$33.

Supplies: Track bolts, 6.50c; heat treated, 6.75c. Tie plates $51 net ton, base. Standard spikes, 3.65c.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago. Additional discounts: 5 for carloads; 10 for full containers, except tire, step and plow bolts.

(Ceiling prices advanced 12 per cent, effective July 27, 1946; discounts remain unchanged.)

Carriage and Machine

½ x 6 and smaller	65½ off
Do., ⅝ and ⅝ x 6-in. and shorter	63½ off
Do., ¾ to 1 x 6-in. and shorter	61 off
1⅛ and larger, all lengths	59 off
All diameters, over 6-in. long	59 off
Tire bolts	50 off
Step bolts	56 off
Plow bolts	65 off

Stove Bolts

In packages, nuts separate, 71-10 off, nuts attached, 71 off; bulk, 80 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hex	U.S.S.	S.A.E.
⅞-in. and smaller	....	64
½-in. and smaller	62	....
½-in.-1-in.	....	60
⅞-in.-1-in.	59	....
1⅛-in.-1½-in.	57	58
1⅝-in. and larger	56	....

Additional discount of 10 for full kegs.

Hexagon Cap Screws

Upset 1-in., smaller	64 off
Milled 1-in., smaller	60 off

Square Head Set Screws

Upset 1-in. and smaller	71 off
Headless, ¼-in. and larger	60 off
No. 10 and smaller	70 off

Rivets

Fob Pittsburgh, Cleveland, Chicago, Birmingham

Structural	4.75c
⅞-inch and under	*65-5 off

*Plus 12 per cent increase on base prices, effective July 26.

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl ..... $2.75-$3.00 off

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 15.15c; extra carbon 19.48c; special carbon 23.80c; oil-hardening 25.97c; high carbon-chromium 46.53c.

W	Cr	V	Mo	Base, per lb
18.00	4	1	....	72.49c
1.5	4	1	8.5	58.43c
....	4	2	3	58.43c
6.40	4.15	1.90	5	62.22c
5.50	4.50	4	4.50	75.74c

Stainless Steels

Base, Cents per lb

CHROMIUM NICKEL STEELS

	Bars	Plates	Sheets	H.R. Strip	C.R. Strip
302	25.96c	29.21c	36.79c	23.93c	30.30c
303	28.13	31.38	38.95	29.21	35.71
304	27.05	31.38	38.95	25.45	32.46
308	31.38	36.79	44.36	30.84	37.87
309	38.95	43.28	50.85	40.03	50.85
310	53.02	56.26	57.35	52.74	60.59
312	38.95	43.28	53.02	....	....
*316	43.28	47.61	51.94	43.28	51.94
§321	31.38	36.79	44.36	31.65	41.12
†347	35.71	41.12	48.69	35.71	45.44
431	20.56	23.80	31.38	18.94	24.35

STRAIGHT CHROMIUM STEEL

403	23.93	26.51	31.92	22.99	29.21
**410	20.02	23.93	28.67	18.39	23.80
416	20.56	23.80	29.21	19.75	25.45
††420	25.96	30.84	36.25	25.70	39.49
430	20.56	23.80	31.38	18.94	24.35
‡‡430F	21.10	24.35	31.92	20.29	26.51
440A	25.96	30.84	36.25	25.70	39.49
442	24.35	27.59	35.17	25.96	34.62
443	24.35	27.59	35.17	25.96	34.62
446	29.76	33.00	39.49	37.87	56.26
501	8.66	12.98	17.04	12.98	18.39
502	9.74	14.07	18.12	14.07	19.48

STAINLESS CLAD STEEL (20%)

(Fob Pittsburgh and Washington, Pa., plate prices include annealing and pickling.)

304	19.48	20.56	....	....
410	17.31	18.39	....	....
430	17.85	18.94	....	....
446	19.48	20.56	....	....

* With 2-3% molybdenum. § With titanium. † With columbium. ** Plus machining agent. †† High carbon. ‡‡ Free machining.

Metallurgical Coke

Price Per Net Ton

Beehive Ovens

Connellsville, furnace	*$8.75
Connellsville, foundry	9.25- 9.75
New River, foundry	10.25-10.50
Wise county, foundry	9.00- 9.50
Wise county, furnace	8.50- 9.00

By-Product Foundry

Kearney, N. J., ovens	14.40
Chicago, outside delivered	14.35
Chicago, delivered	15.10
Terre Haute, delivered	14.85
Milwaukee, ovens	15.10
New England, delivered	16.00
St. Louis, delivered	†15.10
Birmingham, delivered	12.25
Indianapolis, delivered	14.85
Cincinnati, delivered	14.60
Cleveland, delivered	14.55
Buffalo delivered	14.75
Detroit, delivered	15.10
Philadelphia, delivered	14.63

* Operators of hand-drawn ovens using trucked coal may charge $9.35; retroactive to May 17, 1946, on adjustable pricing.

† 15.68 from other than Ala., Mo., Tenn.

Coke By-Products

Spot, gal, freight allowed east of Omaha.

Pure and 90% benzol	15.00c
Toluol, two degree	22.00c
Industrial xylol	22.00c

Per pound fob works

Phenol (car lots, returnable drums)	11.25c
Do., less than carlots	12.00c
Do., tank cars	10.25c

Eastern plants, per pound

Naphthalene flakes, balls, bbl, to jobbers, "household use"	9.00c

Per ton, bulk, fob plants

Sulphate of ammonia	$30.00

WAREHOUSE STEEL PRICES

Base delivered price, cents per pound, for delivery within switching limits, subject to established extras. Quotations based on mill prices announced March 1, 1946

	Hot-rolled bars	Structural shapes	Plates	Floor plates	Hot-rolled sheets (10-gage base)	Hot-rolled strip (14-gage and lighter, 6-in and narrower)	Hot-rolled strip (12-gage and heavier, wider than 6-inch)	Galvanized flat sheets (24-gage base)	Cold-rolled sheets (17-gage base)	Cold-finished bars	Cold-rolled strip
Boston	4.356[1]	4.203[1]	4.203[1]	6.039[1]	4.050[1]	5.548[1]	4.418[1]	5.725[14]	5.031[14]	4.658[21]	4.965
New York	4.134[1]	4.038[1]	4.049[1]	5.875[1]	3.856[1]	4.375[1]	4.275[1]	5.501[13]	4.838[14]	4.584[21]	5.075
Jersey City	4.155[1]	4.018[1]	4.049[1]	5.875[1]	3.856[1]	4.375[1]	4.275[1]	5.501[13]	4.890[13]	4.605[21]	5.075
Philadelphia	4.114[1]	3.937[1]	3.875[1]	5.564[1]	3.774[1]	4.664[1]	4.554[1]	5.499[13]	5.139[26]	4.564[21]	5.064
Baltimore	4.093[1]	4.05[1]	3.865[1]	5.543[1]	3.64[1]	4.293[1]	4.193[1]	5.365[17]	5.118[26]	4.543[21]	.....
Washington	4.232[1]	4.22[1]	4.067[1]	5.632[1]	3.842[1]	4.432[1]	4.332[1]	5.667[17]	5.007[24]	4.532[21]	.....
Norfolk, Va.	4.377[1]	4.303[1]	4.262[1]	5.777[1]	4.037[1]	4.927[1]	4.477[1]	5.862[17]	4.552[24]	4.677[21]	.....
Bethlehem, Pa.*	.....	3.70[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....
Claymont, Del.*	.....	.....	3.70[1]	.....	.....	.....	.....	.....	.....	.....	.....
Coatesville, Pa.*	.....	.....	3.70[1]	.....	.....	.....	.....	.....	.....	.....	.....
Buffalo (city)	3.60[1]	3.65[1]	3.92[1]	5.55[1]	3.575[1]	4.21[1]	4.11[1]	5.20[13]	4.625[13]	4.20[21]	4.96
Buffalo (country)	3.50[1]	3.55[1]	3.55[1]	5.15[1]	3.475[1]	3.85[1]	3 750[1]	5.10[13]	4.525[13]	4.10[21]	4.60
Pittsburgh (city)	3.60[1]	3.65[1]	3.65[1]	5.25[1]	3.575[1]	3.35[1]	3.850[1]	5.327[13]	4.625[24]	4.20[21]	4.70
Pittsburgh (country)	3.50[1]	3.55[1]	3.55[1]	5.15[1]	3.475[1]	3.85[1]	3.750[1]	5.10[13]	4.525[24]	4.10[21]	4.60
Cleveland (city)	3.60[1]	3.88[1]	3.65[1]	5.48[1]	3.575[1]	3.95[1]	3.850[1]	5.347[13]	4.625[24]	4.20[21]	4 70
Cleveland (country)	3.50[1]	.....	3.55[1]	.....	3.475[1]	3.85[1]	3.750[1]	.....	4.525[24]	4.10[21]	4.60
Detroit	3.70[1]	3.952[1]	3.90[1]	5.572[1]	3.675[1]	4.050[1]	3 950[1]	5.491[13]	4.725[24]	4.25[13]	4.95
Omaha (city, del.)	4.32[1]	4.37[1]	4.37[1]	5.97[1]	4.045[1]	4.52[1]	4.42[1]	6.00[13]	5.72[24]	4.945[21]	....
Omaha (country)	4.22[1]	4.27[1]	4.27[1]	5.87[1]	3.945[1]	4.42[1]	4.32[1]	5.90[13]	.....	.....	.....
Cincinnati	3.902[1]	3.983[1]	3.952[1]	5.583[1]	3.671[1]	4.046[1]	3.946[1]	5.296[13]	4.271[24]	4.602[21]	.....
Youngstown*	.....	.....	.....	.....	.....	.....	.....	4.85[13]	.....	.....	.....
Middletown, O.*	.....	.....	.....	.....	3.475[2]	3.95[1]	3.750[1]	5 10[13]	.....	.....	.....
Chicago (city)	3.75[1]	3.80[1]	3.80[1]	5.40[1]	3.475[1]	3.95[1]	3.850[1]	†5.40[13]	4.425[24]	4.20[21]	4.90
Milwaukee	3.908[1]	3.958[1]	3.958[1]	5.558[1]	3.633[1]	4.108[1]	4.008[1]	†5.558[13]	4.583[24]	4.358[21]	5.058
Indianapolis	3.83[1]	3.88[1]	3.88[1]	5.48[1]	3.743[1]	4.118[1]	4.018[1]	5.368[13]	4.793[24]	4.43[21]	5.060
St. Paul	4.092[3]	4.142[3]	4 142[3]	5.742[3]	3.817[3]	4.292[3]	4.192[3]	5.666[13]	4.767[24]	4.852[21]	5.398
St. Louis	3.918[1]	3.968[1]	3.968[1]	5.568[1]	3.643[1]	4.118[1]	4.018[1]	5.622[13]	4.593[24]	4.522[21]	5.222
Memphis, Tenn.	4.296[1]	4.346[1]	4.346[1]	6.071[1]	4.221[1]	4.596[1]	4.496[1]	5.746[13]	.....	4.821[21]	.....
Birmingham	3.75[1]	3.80[1]	3.80[1]	6.153[1]	3.675[1]	4.05[1]	4.05[1]	5.20[13]	5.077[24]	4.99[21]	5.465
New Orleans (city)	4.358[1]	4.408[1]	4.408[1]	6.329[1]	4.283[1]	4.658[1]	.....	5.808[13]	5.304[24]	5.079[21]	.....
Houston, Tex.	4.00[3]	4.50[1]	4.50[1]	5.75[3]	3.988[3]	4.668[3]	4.563[1]	5.763[24]	5.819[24]	4.10[21]	.....
Los Angeles	4.65[4]	4.90[4]	5.20[4]	7.45[4]	5.225[4]	5.30[4]	5.200[4]	6.55[13]	7.425[6]	6.033[21]	5.863
San Francisco	4.20[7]	4.15[7]	4.15[7]	5.85[7]	4.125[7]	5.85[7]	4.50[7]	6.35[13]	6.875[15]	5.783[21]	7.588
Portland, Oreg.	4.70[27]	4.70[27]	5.00[27]	6.75[27]	4.875[27]	6.65[27]	5.000[27]	6.20[13]	6.825[13]	5.983[13]	.....
Tacoma, Wash.	4.60[6]	4.70[6]	5.00[6]	6.75[6]	4.87[6]	5.80[6]	4.60[6]	6.40[13]	6.55[13]	6.23[21]	.....
Seattle	4.60[6]	4.70[6]	5.00[6]	6.75[6]	4.87[6]	5.80[6]	4.60[6]	6.40[13]	6.55[13]	6.23[21]	.....

*Basing point cities with quotations representing mill prices, plus warehouse spread; †open market price.

BASE QUANTITIES

[1]—400 to 1999 pounds; [2]—400 to 14,999 pounds; [3]—any quantity; [4]—300 to 1999 pounds; [5]—400 to 8999 pounds; [6]—300 to 9999 pounds; [7]—400 to 39,999 pounds; [8]—under 2000 pounds; [9]—under 4000 pounds; [10]—500 to 1499 pounds; [11]—one bundle to 39,999 pounds; [12]—150 to 2249 pounds; [13]—150 to 1499 pounds; [14]—three to 24 bundles; [15]—450 to 1499 pounds; [16]—one bundle to 1499 pounds; [17]—one to nine bundles; [18]—one to six bundles; [19]—100 to 749 pounds; [20]—300 to 1999 pounds; [21]—1500 to 39,999 pounds; [22]—1500 to 1999 pounds; [23]—1000 to 39,999 pounds; [24]—400 to 1499 pounds; [25]—1000 to 1999 pounds; [26]—under 25 bundles. Cold-rolled strip, 2000 to 39,999 pounds, base; [27]—300 to 4999 pounds.

ORES

Lake Superior Iron Ore

Gross ton, 51½% (Natural) Lower Lake Ports

Old range bessemer	$5.45
Mesabi nonbessemer	5.05
High phosphorus	5.05
Mesabi bessemer	5.20
Old range nonbessemer	5.30

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56-63% contract	13.00

Foreign Ore

Cents per unit, cif Atlantic ports

Manganiferous ore, 45-55% Fe., 6-10% Mn.	Nom.
N. African low phos.	Nom.
Swedish basic, 60 to 68%	Nom.
Spanish, N. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro	7.50-8.00

Tungsten Ore

Chinese Wolframite, per short ton unit, duty paid	$24.00

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Oreg., or Tacoma, Wash.

(S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African

48% 2.8:1	$39.75
48% 3:1	41.00
48% no ratio	31.00

South African (Transvaal)

44% no ratio	$27.40
45% no ratio	28.30
48% no ratio	31.00
50% no ratio	32.80

Brazilian—nominal

44% 2.5:1 lump	$33.65
48% 3:1 lump	43.50

Rhodesian

45% no ratio	$28.30
48% no ratio	31.00
48% 3:1 lump	41.00

Domestic (seller's nearest rail)

48% 3:1	$43.50

less $7 freight allowance.

Manganese Ore

Sales prices of Office of Metals Reserve, cents per gross ton unit, dry, 48%, at New York, Philadelphia, Baltimore, Norfolk, Mobile and New Orleans, 85c; Fontana, Calif., Provo, Utah, and Pueblo, Colo., 91c; prices include duty on imported ore and are subject to established premiums, penalties and other provisions. Price at basing points which are also points of discharge of imported manganese ore is fob cars, shipside, at dock most favorable to the buyer. Outside shipments direct to consumers at 15c to 17c per unit less than Metal Reserve prices.

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.70

NATIONAL EMERGENCY STEELS (Hot Rolled)

(Extras for alloy content)

Basic open-hearth Electric furnaces

Designation	Chemical Composition Limits, Per Cent						Bars per 100 lb.	Billets per GT	Bars per 100 lb.	Billets per GT
	Carbon	Mn	Si	Cr	Ni	Mo				
NE 9415	.13-.18	.80-1.10	.20-.35	.30-.50	.30-.60	.08-.15	$0.812	$16.230	$1.353	$27.050
NE 9425	.23-.28	.80-1.20	.20-.35	.30-.50	.30-.60	.08-.15	.812	16.230	1.353	27.050
NE 9442	.40-.45	1.00-1.30	.20-.35	.30-.50	.30-.60	.08-.15	.866	17.312	1.407	28.132
NE 9722	.20-.25	.50-.80	.20-.35	.10-.25	.40-.70	.15-.25	.703	14.066	1.244	24.886
NE 9912	.10-.15	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.298	25.968	1.677	33.542
NE 9920	.18-.23	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.298	25.968	1.677	33.542

Extras are in addition to a base price of 2.921c, per pound on finished products and $58.43 per gross ton on semifinished steel major basing points and are in cents per pound and dollars per gross ton. No prices quoted on vanadium alloy.

Pig Iron

Maximum prices per gross ton fixed by OPA schedule No. 10, last amended July 27, 1946; $2 increase may be charged on adjustable pricing contracts made between May 29 and July 27. Delivered prices do not include 3 per cent federal tax, effective Dec. 1, 1942.

	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	$29.50	$29.00	$30.50	$30.00
Newark, N. J., del.	31.20	30.70	32.20	31.70
Brooklyn, N. Y., del.	32.28	.....	.....	32.78
Birdsboro, Pa., base	29.50	29.00	30.50	30.00
Birmingham, base	24.88	23.50	29.50	.....
Baltimore, del.	30.22	.....	.....	.....
Boston, del	29.68	.....	.....	.....
Chicago, del.	28.72	.....	.....	.....
Cincinnati, del.	28.94	28.06	.....	.....
Cleveland, del.	28.62	27.74	.....	.....
Newark N. J.	30.82	.....	.....	.....
Philadelphia, del.	30.05	29.55	.....	.....
St. Louis, del.	28.62	29 54	.....	.....
Buffalo, base	28.50	27 50	29.50	29.00
Boston, del.	30.06	29.56	31.06	30.56
Rochester, del.	30.03	.....	31.03	30.53
Syracuse, del.	30.58	.....	31.58	31.08
Chicago, base	28.50	28.00	29.00	28.50
Milwaukee, del.	29.73	29.23	30.23	29.73
Muskegon, Mich., del.	32.05	.....	.....	32.05
Cleveland, base	28.50	28.00	29.00	28.50
Akron, Canton, del.	30.04	29 54	30.54	30.04
Detroit, base	28.50	28 00	29 00	28.50
Saginaw, Mich., del.	30.81	30.31	31 31	30.81
Duluth, base	29.00	28.50	29 50	29.00
St. Paul, del.	31.13	30.63	31 63	31.13
Erie, Pa., base	28.50	28.00	29 50	29.00
Everett, Mass., base	29.50	29.00	30 50	30.00
Boston, del.	30 06	29.56	31 06	30.56
Granite City, Ill., base	28.50	28.00	29.00	28.50
St. Louis, del.	29.00	28.50	.....	29 00
Hamilton, O., base	28.50	28.00	.....	28.50
Cincinnati, del.	29 68	29.18	.....	29.68
Neville Island, Pa., base	28.50	28.00	29.00	28.50
*Pittsburgh, del., N.&S. sides	29.27	28.77	29.77	29.27
Provo, Utah, base	26.50	26.00	.....	.....
Sharpsville, Pa., base	28.50	28.00	29.00	28.50
Sparrows Point, base	29.50	29.00	.....	.....
Baltimore, del.	30.60	.....	.....	.....
Steelton, Pa., base	.....	29.00	.....	.....
Swedeland, Pa., base	29.50	29.00	30.50	30.00
Philadelphia, del.	30.43	29.93	.....	30.93
Toledo, O., base	28.50	28.00	29.00	28.50
Youngstown, O., base	28.50	28.00	29 00	28.50
Mansfield, O., del.	30.66	30.16	31.16	30.66

* To Neville Island base add: 61c for McKees Rocks, Pa.; 93c Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Aliquippa; 97c (water), Monongahela; $1.24, Oakmont, Verona; $1.38, Brackenridge.

Exceptions to above prices: Struthers Iron & Steel Co., Struthers, O., may charge 50 cents a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable pig iron. Republic Steel Corp. may quote $2 a ton higher for foundry and basic pig iron on the Birmingham base.

High Silicon, Silvery

6.00-6.50 per cent (base) $34.00
6.51-7.00..$35.00 9.01- 9.50. 40.00
7.01-7.50.. 36.00 9.51-10.00. 41.00
7.51-8.00.. 37.00 10.01-10.50. 42.00
8.01-8.50.. 38.00 10.51-11.00. 43.00
8.51-9.00.. 39.00 11.01-11.50. 44.00

Fob Jackson county, O., per gross ton; Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

Electric Furnace Ferrosilicon: Si 14.01 to 14.50%, $50 Jackson co.; each additional 0.50% silicon up to and including 18% add $1; low impurities not exceeding 0.005 P, 0.40 Si, 1.0% C, add $1.

Bessemer Ferrosilicon

Prices same as for high silicon silvery iron, plus $1 per gross ton.

Charcoal Pig Iron

Semi-cold blast, low phosphorus.

Fob furnace, Lyles, Tenn., $33.00. (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $28.00
Valley base 28.00

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Buffalo, N. Y., $34.00 base; $35.38, del., Philadelphia. Intermediate phosphorus, Central Furnace, Cleveland, $31.00.

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge not to exceed 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge not to exceed 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Refractories

Per 1000, fob shipping point. Net prices

Fire Clay Brick

Super Duty

Pa., Mo., Ky. $81.00

High Heat Duty

Pa., Ill., Md., Mo., Ky. . . . 65.00
Ala., Ga. 65.00
N. J. 70.00

Intermediate Heat Duty

Ohio 57.00
Pa., Ill., Md., Mo., Ky. 59.00
Ala., Ga. 51.00
N. J. 62.00

Low Heat Duty

Pa., Md., Ohio 51.00

Malleable Bung Brick

All bases 75.00

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry Press 42.00
Wire Cut 40.00

Silica Brick

Pennsylvania 65.00
Joliet, E. Chicago 74.00
Birmingham, Ala. 65.00

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.
Bulk 22.00
Bags 26.00

Basic Brick

Net ton, fob Baltimore, Plymouth Meeting, Chester, Pa.
Chrome brick 54.00
Chem. bonded chrome 54.00
Magnesite brick 76.00
Chem. bonded magnesite ... 65.00

Fluorspar

Metallurgical grade, fob shipping point in Ill., Ky., net ton, carloads, effective CaF_2 content, 70% or more, $33; 65% to 70%, $32; 60% to 65%, $31; less than 60%, $30.

Ferroalloy Prices

Spiegeleisen: 19-21% carlot per gross ton, Palmerton, Pa., $36; Pittsburgh, $40.50; Chicago, $40.60.

Ferromanganese, standard: 78-82% c.l. gross ton, duty paid, $135 fob cars, Baltimore, Philadelphia or New York, whichever is most favorable to buyer, Rockdale or Rockwood, Tenn. (where Tennessee Products Co. is producer), Birmingham, Ala. (where Sloss-Sheffield Steel & Iron Co. is producer); $140 fob cars, Pittsburgh (where Carnegie-Illinois Steel Corp. is producer); add $6 for packed c.l., $10 for ton, $13.50 for less ton; $1.70 for each 1%, or fraction contained manganese over 82% or under 78%.

Ferromanganese, low carbon: Eastern zone: Special, 21c; regular, 20.50c; medium, 14.50c; central zone: Special, 21.30c; regular, 20.80c; medium, 14.80c; western zone: Special, 21.55c; regular, 21.05c; medium, 15.75c. Prices are per pound contained Mn, bulk carlot shipments, fob shipping point, freight allowed. Special low-carbon has content of 90% Mn, 0.10% C, and 0.06% P.

Ferromanganese Briquets: (Weight approx. 3 lb and containing exactly 2 lb Mn) per lb of briquets. Contract, carlots, bulk 0.0605c, packed 0.063c, tons 0.0655c, less 0.068c, eastern, freight allowed; 0.063c, 0.0655c, 0.0755c and 0.078c, central; 0.066c, 0.0685c, 0.0855c and 0.088c, western; spot up 0.25c.

Ferrotungsten: Spot 10,000 lb or more, per lb contained W, $1.90; contract, $1.88; freight allowed as far west as St. Louis.

Ferrotitanium: 40-45%, R.R. freight allowed, per lb contained Ti; ton lots $1.23; less-ton lots $1.25; eastern. Spot up 5c per lb.

Ferrotitanium: 20-25%, 0.10 maximum carbon; per lb contained Ti; ton lots $1.35; less-ton lots $1.40 eastern. Spot up 5c per lb.

Ferrotitanium, High-Carbon: 15-20% contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C $142.50; 3-5% C $157.50.

Ferrovanadium: V 35-55%, contract basis, per lb contained V, fob producers plant with usual freight allowances; open-hearth grade $2.70; special grade $2.80; highly-special grade $2.90.

Ferromolybdenum: 55-75% per lb. contained Mo, fob. Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Ferrophosphorus: 17-19%, based on 18% P content with unitage of $3 for each 1% of P above or below the base; gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferrosilicon: Contract, lump, packed; eastern zone quotations: 90-95% c.l. 12.65c, ton lots 13.10c, smaller lots 13.50c; 80-90% c.l. 10.35c, ton lots 10.85c, smaller lots 11.35c; 75% c.l. 9.40c, ton lots 9.95c, smaller lots 10.45c; 50% c.l. 7.90c, ton lots 8.50c, smaller lots 9.10c. Prices are fob shipping point, freight allowed. per lb. of contained Si. Spot prices 0.25c higher on 80-90%, 0.30c on 75%, 0.45c on 50%. Deduct 0.85c for bulk carlots.

Ferro-Boron: (B 17.50% min., Si 1.50% max., Al 0.50% max. and C 0.50% max.) per lb of alloy contract ton lots $1.20, less ton lots $1.30, eastern, freight allowed; $1.2075 and $1.3075 central; $1.229 and $1.329, western; spot add 5c.

Ferrocolumbium: 50-60% per lb contained columbium in gross ton lots, contract basis, R. R. freight allowed, eastern zone, $2.25; less-ton lots $2.30. Spot prices up 10 cents.

Ferrochrome: Contract, lump, packed; high carbon, eastern zone, c.l. 15.05c, ton lots 15.55c; central zone, add 0.40c and 0.65c; western zone, add 0.5c and 1.85c; high carbon, high nitrogen, add 5c to all high carbon ferrochrome prices. Deduct 0.55c for bulk carlots. Spot prices up 0.25c.

Low carbon, eastern zone, bulk, c.l., max. 0.06% C 23c; 0.1% 22.50c, 0.15% 22c, 0.2% 21.50c, 0.5% 21c, 1% 20.50c, 2% 19.50c, add 1c for 2000 lb to c.l.; central zone, add 0.4c for bulk, c.l., and 0.65c for 2000 lb to c.l.; western zone, add 0.5c for bulk, c.l., and 1.85c for 2000 lb to c.l.; carload packed differential 0.45c. Prices are per pound of contained Cr, fob shipping points. **Low carbon, high nitrogen:** Add 2c to low carbon ferrochrome prices. For higher nitrogen low carbon, add 2c for each 0.25% of nitrogen over 0.75%.

Ferrochrome, Special Foundry: (Cr 62-66%, C about 5-7%): Contract, lump, packed, eastern zone, freight allowed, c.l. 15.60c, ton lots 16.10c, less than ton 16.75c; central zone, add 0.40c for c.l. and 0.65c for smaller lots; western zone, add 0.5c for c.l. and 1.85c for smaller lots. Deduct 0.55c for bulk carlots.

S. M. Ferrochrome, high carbon (Cr 60-65%, Si, Mn and C 4-6% each): Contract, lump, packed, eastern zone, freight allowed, c.l. 16.15c, ton lots 16.65c, less ton 17.30c; central zone, add 0.40c for c.l. and 0.65c for smaller lots; western zone, add 0.5c for c.l. and 1.85c for smaller lots. Prices are per lb of contained chromium; spot prices 0.25c higher. Deduct 0.55c for bulk carlots.

S.M. Ferrochrome, low carbon: (Cr 62-66%, Si 4-6%, Mn 4-6% and C 1 25% max.) Contract, carlot, bulk, 20.00c, packed 20 45c, ton lots 21 00c, less ton lots 22.00c, eastern, freight allowed. per pound contained chromium, 20.40c, 20 50c, 20.95c and 22.65c, central; 21.00c, 21.45c, 22.85c and 23.85c, western; spot up 0.25c.

Ferrochrome Briquets: Containing exactly 2 lb. Cr, packed, eastern zone, c.l. 9.50c, ton lots 9.80c, less than ton 10.10c, central zone, add 0.3c for c.l. and 0.5c for smaller lots; western zone, add 0.70c for c.l. and 2c for smaller lots. Deduct 0.30c for bulk carlots. Prices per lb. of briquets; spot prices 0.25c higher.

Chromium Metal: 97% min. chromium, max. 0.50% carbon, eastern zone, per lb contained chromium bulk, c.l., 79.50c, 2000 lb to c.l. 80c; central 81c and 82.50c; western 82.25c and 84.75c; fob shipping point, freight allowed.

Chromium-Copper: (Cr 8-11%, Cu 88-90%, Fe 1% max., Si 0.50% max.) contract, any quantity, 45c, eastern, Niagara Falls, N. Y., basis, freight allowed to destination, except to points taking rate in excess of St. Louis rate to which equivalent of St. Louis rate will be allowed; spot up 2c.

Calcium metal; cast: Contract ton lots or more $1.35, less, $1.60 pound of metal; $1.36 and $1.61 central, $1.40 and $1.65, western; spot up 5c.

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%), per lb. of alloy. Contract, carlots, 15.50c, ton lots 16.50c and less 17.00c, eastern, freight allowed; 16.00c, 17.35c, and 17.85c, central; 18.05c, 19.10c and 19.60c western; spot up 0.25c.

Calcium - Silicon: (Ca 30-35%, Si 60-65% and Fe 3.00% max.), per lb. of alloy. Contract, carlots, lump 13.00c, ton lots 14.50c, less 15.50c eastern, freight allowed; 13.50c, 15.25c and 16.25c, central; 15.55c, 17.40c and 18.40c, western; spot up 0.25c.

Silicon Metal: Min. 97% Si and max. 1% Fe, eastern zone, bulk, c.l., 12.90c; 2000 lb to c.l., 13.45c; central, 13.20c and 13.90c; western, 13.85c and 16.80c; min. 96% Si and max. 2% Fe, eastern, bulk; c.l., 12.50c, 2000 lb to c.l., 13.10c; central, 12.80c and 13.55c; western, 13.45c and 16.50c, fob shipping point, freight allowed. Price per lb contained Si.

Silicomanganese, containing exactly 2 lb. Mn and about ½ lb. Si, eastern zone, bulk, c.l. 5.80c, ton lots 6.35c; central zone, add 0.25c for c.l. and 1c for ton lots; western, add 0.55c for c.l. and 0.20c for ton lots. **Ferrosilicon,** weighing about 5 lb. and containing exactly 2 lb. Si, or about 2½ lb. and containing exactly 1 lb. Si, packed, eastern zone, c.l. 3.90c, ton lots 4.15c, less ton lots 4.45c; central zone, add 0.15c for c.l. and 0.40c for smaller lots; western zone, add 0.30c for c.l. and 0.45c for smaller lots. Prices are fob shipping point, freight allowed; spot prices 0.25c higher. Deduct 0.30c for bulk carlots.

Manganese Metal: (Min. 96% Mn, max. 2% Fe), per lb of metal, eastern zone, bulk, c.l., 30c, 2000 lb to c.l., 32c, central, 30.25c, and 33c; western, 30.55c and 35.05c.

Electrolytic Manganese: 99.9% plus, fob Knoxville, Tenn., freight allowed east of Mississippi on 250 lb or more: Carlots 32c, ton lots 34c, drum lots 36c, less than drum lot 38c. Add 1½c for hydrogen-removed metal.

Manganese-Boron: (Mn 75% approx., B 15-20%, Fe 5% max., Si 1.50% max. and C 3% max.) per lb of alloy. Contract ton lots, $1.89, less $2.01, eastern; freight allowed; $1 903 and $2.023, central, $1.935 and $2 055 western; spot up 5c.

Nickel-Boron: (B 15-18%, Al 1% max., Si 1.50% max., C 0.50% max., Fe 3% max., Ni, balance), per lb of alloy. Contract, 5 tons or more, $1 90, 1 ton to 8 ton, $2.00, less than ton $2.10, eastern, freight allowed; $1.9125, $2.0125 and $2.1125, central; $1.9445, $2.0445 and $2.1445, western; spot same as contract.

Borosil: 3 to 4% B, 40 to 45% Si, $6.25 lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: B 1.5-1.9%, ton lots, 45c lb; less-ton lots, 50c lb.

Carbortam: B 0.90 to 1.15% net ton to carload, 8c per lb fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%), per lb of alloy contract, carlots 25 00c, ton lots 26.00c, less ton lots 27.00c, eastern, freight allowed, 25 50c, 26 75c and 27.75c, central; 27 50c, 28 90c and 29.90c, western; spot up 0.25c.

Silvaz Alloy: (Si 35-40%, Va 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%), per lb of alloy. Contract, carlots 58.00c, ton lots 59 00c, less 60.00c, eastern freight allowed; 58.50c, 59 75c and 60.75c, central; 60.50c, 61 90c and 62.90c, western; spot up 0.25c.

SMZ Alloy: (Si 60-55%, Mn 5-7%, Zr 5-7% and Fe approx. 20% (per lb of alloy contract carlots 11.50c, ton lots 12.00c, less 12.50c, eastern zone, freight allowed; 12.00c, 12.85c and 13.35c central zone; 14 05c, 14 60c and 15.10c, western; spot up 0.25c.

CMSZ Alloy 4: (Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75% and C 3.00-4.50%). Contract carlots, bulk, 11.00c and packed 11.50c; ton lots 12.00c; less 12.50c, eastern, freight allowed; 11.50c and 12.00c, 12.75c, 13.25c, central; 13.50c and 14.00c, 14.75c, 15.25c, western; spot up 0.25c.

CMSZ Alloy 5: (Cr 50-56%, Mn 4-6%, Si 13.50-16.00%, Zr 0.75-1.25%, C 3.50-5.00%) per lb of alloy. Contract, carlots, bulk, 10.75c, packed 11.25c, ton lots 11.75c, less 12.25c, eastern, freight allowed; 11.25c, 11.75c, 12.50c and 13.00c, central; 13.25c and 13.75c, 14.50c and 15.00c, western; spot up 0.25c.

Zirconium Alloy: Zr 12-15%, per lb of alloy, eastern contract, carlots, bulk, 4.60c, packed 4.80c, ton lots 4.80c, less tons 5c, carloads, bulk, per gross ton $102.50; packed $107.50; ton lots $108; less-ton lots $112.50. Spot up $5 per ton.

Zirconium Alloy: Zr 35-40%, eastern, contract basis, carloads in bulk or package, per lb of alloy 14.00c; gross ton lots 15.00c; less-ton lots 16.00c. Spot up ¼c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) contract basis fob Niagara Falls, N. Y., lump per lb 5.88c; ton lots 6.38c; less 6.88c. Spot up ½c.

Siminal: (Approx. 20% each Si, Mn, Al) Contract, freight not exceeding St. Louis rate allowed, per lb alloy; carlots 8c; ton lots 8.75c; less-ton lots 9.25c.

Tungsten Metal Powder: Spot, not less than 97%, $2.50-$2.60; freight allowed as far west as St. Louis.

Grainal: Vanadium Grainal No. 1 87.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

Vanadium Pentoxide, technical grade: Fused, approx. 89-92% V_2O_5 and 5.84% NA_2O; or air dried, 83-85% V_2O_5 and 5.15% NA_2O, $1.10 per lb contained V_2O_5, fob plant, freight allowed on quantities of 25 lb and over to St. Louis.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Following prices are quotations developed by editors of STEEL in the various centers. Quotations are on gross tons.

PHILADELPHIA:
(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$18.75
No. 2 Heavy Melt. Steel	18.75
No. 2 Bundles	18.75
No. 3 Bundles	16.75
Mixed Borings, Turnings	13.75
Machine Shop Turnings	13.75
Billet, Forge Crops	23.75
Bar Crops, Plate Scrap	21 25
Cast Steel	21.25
Punchings	21.25
Elec. Furnace Bundles	19 75
Heavy Turnings	18.25
Chemical Borings	16.51

Cast Iron Grades
(Fob Shipping Point)

Heavy Breakable Cast	20.00
Charging Box Cast	21.00
Cupola Cast	25.00
Unstripped Motor Blocks	20.00
Malleable	24.00

NEW YORK:
(Dealers' buying prices)

No. 1 Heavy Melt. Steel	$15.33
No. 2 Heavy Melt. Steel	15.33
No. 2 Hyd. Bundles	15.33
No. 3 Hyd. Bundles	13.33
Chemical Borings	14.33
Machine Turnings	10.33
Mixed Borings, Turnings	10.33
No. 1 Cupola	25.00
Charging Box, Cast	21.00
Heavy Breakable, Cast	20.00
Unstripped Motor Blocks	20.00
Stove Plate	23.50

BOSTON:
(Fob shipping points, Boston differential 99c higher, steelmaking grades; Providence, $1.09 higher)

No. 1 Heavy Melt. Steel	$14 06
No. 2 Heavy Melt. Steel	14.06
No. 1 Bundles	14.06
No. 2 Bundles	14.06
No. 1 Busheling	14.06
Machine Shop Turnings	9 06
Mixed Borings, Turnings	9.06
Short Shovel Turnings	11.06
Chemical Borings	13 31
Low Phos Clippings	16 56
No. 1 Cast	25.00
Clean Auto Cast	27.00
Stove Plate	23.50
Heavy Breakable Cast	20.00

BUFFALO:
(Delivered consumers' plant)

No. 1 Heavy Melt. Steel	$19.25
No. 2 Heavy Melt. Steel	19.25
No. 1 Bundles	19.25
No. 2 Bundles	19.25
No. 1 Busheling	19.25
Machine Turnings	14.25
Short Shovel Turnings	16.25
Mixed Borings, Turn.	14.25
Cast Iron Borings	15 25
No. 1 Cast	25.00
Low Phos. Plate	21.75

PITTSBURGH:
(Delivered consumers' plant)

Railroad Heavy Melting	$21.00
No. 1 Heavy Melt. Steel	20.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Comp. Bundles	20.00
No. 2 Comp. Bundles	20.00
Short Shovel Turnings	17.00
Mach. Shop Turnings	15.00
Mixed Borings, Turnings	15.00
No. 1 Cupola Cast	*25.00
Heavy Breakable Cast	*19.50
Stove Plate	*23.00
Cast Iron Borings	16.00
Billet, Bloom Crops	25.00
Sheet Bar Crops	22.50
Plate Scrap, Punchings	22.50
Railroad Specialties	24.50
Scrap Rail	21.50
Axles	26.00
Rail 3 ft. and under	23.50
Railroad Malleable	22.00

* Shipping point.

CLEVELAND:
(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$19.50
No. 2 Heavy Melt. Steel	19.50
No. 1 Comp. Bundles	19.50
No. 2 Comp Bundles	19.50
No. 1 Busheling	19.50
Mach. Shop Turnings	14.50
Short Shovel Turnings	16.50
Mixed Borings, Turnings	14.50
No. 1 Cupola Cast	25.00
Heavy Breakable Cast	20.00
Cast Iron Borings	13.50-14.00
Billet, Bloom Crops	24.50
Sheet Bar Crops	22.00
Plate Scrap, Punchings	22.00
Elec. Furnace Bundles	20.50

VALLEY:
(Delivered consumer's plant)

No. 1 R.R. Heavy Melt.	$21.00
No. 1 Heavy Melt. Steel	20.00
No. 1 Comp. Bundles	20.00
Short Shovel Turnings	17.00
Cast Iron Borings	16.00
Machine Shop Turnings	15.00
Low Phos. Plate	22.50

MANSFIELD:
(Delivered consumer's plant)

Machine Shop Turnings	$15.00

CINCINNATI:
(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$19 50
No. 2 Heavy Melt. Steel	19.50
No. 1 Comp. Bundles	19.50
No. 2 Comp. Bundles	19.50
Machine Turnings	10.50-11.00
Shoveling Turnings	12.50-13.00
Cast Iron Borings	11.50-12.00
Mixed Borings, Turnings	10.50-11 00
No. 1 Cupola Cast	25.00
Breakable Cast	17.75
Low Phos. Plate	21.00-22.00
Scrap Rails	20.50-21 00
Stove Plate	23.50

DETROIT:
(Delivered consumer's plant)

Heavy Melting Steel	$17.32
No. 1 Busheling	17.32
Hydraulic Bundles	17.32
Flashings	17.32
Machine Turnings	12.32
Short Shovel, Turnings	14.32
Cast Iron Borings	13 32
Low Phos Plate	19 82
No. 1 Cast	25.00
Heavy Breakable Cast	20.00

CHICAGO:
(Delivered consumer's plant; cast grades fob shipping point; railroad grades fob tracks)

No. 1 R.R. Heavy Melt.	$19.75
No. 1 Heavy Melt Steel	18 75
No. 2 Heavy Melt. Steel	18.75
No. 1 Ind. Bundles	18 75
No. 2 Dlr. Bundles	18 75
Baled Mach. Shop Turn.	18 75
No. 3 Galv. Bundles	16.75
Machine Turnings	13.75
Mix. Borings, Sht. Turn.	13.75
Short Shovel Turnings	15.75
Cast Iron Borings	14.75
Scrap Rails	20.25
Cut Rails, 3 feet	22 25
Cut Rails, 18-inch	23.50
Rerolling Rails	22.25
Angles, Splice Bars	22.25
Plate Scrap, Punchings	21.25
Railroad Specialties	22 75
No. 1 Cast	25.00
R.R. Malleable	22.00

ST. LOUIS:
(Delivered consumer's plant; cast grades fob shipping point)

Heavy Melting	$17.50
No. 1 Locomotive Tires	21.00
Misc. Rails	19.00
Railroad Springs	22.00
Bundled Sheets	17.50
Axle Turnings	17.00
Machine Turnings	10.50
Shoveling Turnings	12.50
Rerolling Rails	21.00
Street Car Axles	24.50
Steel Rails, 3 ft.	21.50
Steel Angle Bars	21.00
No. 1 Cast Iron Wheels	22.00
No. 1 Cupola Cast	25.00
Charging Box Cast	21.00
Railroad Malleable	22.00
Breakable Cast	17.75
Stove Plate	23.50
Grate Bars	15.25
Brake Shoes	15.25

BIRMINGHAM:
(Delivered consumer's plant)

Billet Forge Crops	$22.50
Structural, Plate Scrap	19.00
Scrap Rails Random	18.50
Rerolling Rails	20.50
Angle Splice Bars	20.50
Solid Steel Axles	24.00
Cupola Cast	25.00
Stove Plate	23.50
Long Turnings	11 00
Cast Iron Borings	13.00
No. 1 Cast Iron Wheels	22.00

LOS ANGELES:
(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$14.00
No. 2 Heavy Melt. Steel	13.00
No. 1, 2 Dlr. Bundles	12.00
Machine Turnings	5.50
Mixed Borings, Turnings	5.50
No. 1 Cast	25.00

SAN FRANCISCO:
(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$17.00
No. 2 Heavy Melt. Steel	17.00
No. 1 Busheling	17.00
No. 1, No. 2 Bundles	17.00
No. 3 Bundles	9.00
Machine Turnings	7.00
Billet, Forge Crops	15.50
Bar Crops, Plate	15.50
Breakable Cast	17.75
Cut, Structural, Plate 1 ft and under	18.00
Alloy-free Turnings	7.00
Tin Can Bundles	14.50
Iron, Steel Axles	24.00
No. 2 Cast Steel	20.50
Uncut Frogs, Switches	18.00
Scrap Rails	18.50
Locomotive Tires	20.50

SEATTLE:
(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$14.50
No. 2 Heavy Melt. Steel	14.50
Heavy Railroad Scrap	15.50
(Fob shipping point)	
No. 1 Cupola Cast	25.00

NONFERROUS METAL PRICES

Copper: Electrolytic or Lake from producers in carlots 14.37½c, del. Conn.; less carlots 14.50c, refinery. Dealers may add ¾c for 5000 lb to carload; 1c, 1000-4999 lb; 1½c, 500-999 lb; 2c, 0-499 lb. Casting, 14.12½c, refinery, 20,000 lb or more; 14.37½c, less than 20,000 lb.

Brass Ingot: 85-5-5-5 (No. 115) 15.50c; 88-10-2 (No. 215) 18.75c; 80-10-10 (No. 305) 18.25c; No. 1 yellow (No. 405) 12.50c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than 20 tons.

Zinc: Prime western 8.25c, select 8.35c, brass special 8.50c, intermediate 8.75c, E. St. Louis; high grade 9.25c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

Lead: Common 8.10c, chemical 8.20c, corroding, 8.20c, E. St. Louis for carlots; add 5 points for Chicago, Minneapolis-St. Paul, Milwaukee-Kenosha districts; add 15 points for Cleveland - Akron - Detroit area, New Jersey, New York state, Texas, Pacific Coast, Richmond, Indianapolis-Kokomo; add 20 points for Birmingham, Connecticut, Boston - Worcester, Springfield, New Hampshire, Rhode Island.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ½c 2000-9999 lb; 1c less through 2000 lb.

Secondary Aluminum: Piston alloy (No. 122 type) 12.75c; No. 12 foundry alloy (No. 2 grade) 12.87½c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 14.37½c; grade 2 (92-95%) 13.25c; grade 3 (90-92%) 12.00c; grade 4 (85-90%) 11.37½c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, 17 lb) 20.50c per lb, carlots; 22.50c 100 lb to c.l. Extruded 12-in. sticks 27.50c, carlots; 29.50c 100 lb to c.l.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straits), 52.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 51.87½c; Grade C, 99.65-99.79% incl. 51.62½c; Grade D, 99.50-99.64% incl., 51.50c; Grade E, 99-99.49% incl. 51.12½c; Grade F, below 99% (for tin content), 51.00c.

Antimony: American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 14.50c; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 15.00c. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 9999-224 lb; and 2c for 223 lb and less; on sales by dealers, distributors and jobbers add ½c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.5%, fob refinery 35.00c lb; pig and shot produced from electrolytic cathodes 36.00c; "F" nickel shot or ingot for additions to cast iron, 34.00c.

Mercury: Open market, spot, New York, $98-$100 per 76-lb flask.

Arsenic: Prime, white, 99%, carlots, 4.00c lb.

Beryllium-Copper: 3.75-4.25% Be, $14.75 per lb contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms $1.25 lb, del.; anodes, balls, discs and all other special or patented shapes, $1.30.

Cobalt: 97-99%, $1.50 lb, for 550 lb (bbl.); $1.52 lb for 100 lb (case); $1.57 lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Indium: 99.9%, $2.25 per troy ounce.

Silver: Open market, N. Y. 90.12½c per ounce.

Platinum: $81.50 per ounce.

Palladium: $24 per troy ounce.

Iridium: $125 per troy ounce.

Rolled, Drawn, Extruded Products

(Copper and brass product prices based on 14.37½c, Conn., for copper. Freight prepaid on 100 lb or more.)

Sheet: Copper 25.81c; yellow brass 23.67c; commercial bronze, 95% 26.14c, 90% 25.81c; red brass, 85% 24.98c, 80% 24.66c; best quality 24.38c; phosphor bronze, grade A 4% or 5%, 43.45c; Everdur, Duronze or equiv., hot rolled, 30.88c; naval brass 28.53c; manganese bronze 31.99c; muntz metal 26.78c; nickel silver 5% 32.38c.

Rods: Copper, hot rolled 22.16c, cold drawn 23.16c; yellow brass 18.53c; commercial bronze, 95% 25.83c, 90% 25.50c; red brass, 85% 24.67c; 80% 24.35c; best quality 24.07c; phosphor bronze, grade A 4% or 5% 43.70c; Everdur, Duronze or equiv. cold drawn, 29.82c; naval brass 22.59c; manganese bronze 25.93c; muntz metal 22.34c; nickel silver 5% 34.44c.

Seamless Tubing: Copper 25.85c; yellow brass 26.43c; commercial bronze 90% 28.22c; red brass 85% 27.64c, 80% 27.32c; best quality brass 26.79c; phosphor bronze, grade A 5% 44.70c.

Copper Wire: Bare, soft, fob eastern mills, carlots 19.89c, less carlots 20.39c; weatherproof, fob eastern mills carlot 22.07c, less carlots 22.57c; magnet, delivered, carlots, 23.30c, 15,000 lb or more 23.55c, less carlots 24.05c.

Aluminum Sheets and Circles: 2s and 3s flat mill finish, base 30,000 lb or more del.; sheet widths as indicated; circle diameter 9" and larger:

Gage	Width	Sheets	Circles
.249"-7	12"-48"	22.70c	25.20c
8-10	12"-48"	23.20c	25.70c
11-12	26"-48"	24.20c	27.00c
13-14	26"-48"	25.20c	28.50c
15-16	26"-48"	26.40c	30.40c
17-18	26"-48"	27.90c	32.90c
19-20	24"-42"	29.80c	35.30c
21-22	24"-42"	31.70c	37.20c
23-24	3"-24"	25.60c	29.20c

Lead Products: Prices to jobbers; full sheets 11.25c; cut sheets 11.50c; pipe 9.90c, New York, 10.00c Philadelphia, Baltimore, Rochester and Buffalo, 10.50c Chicago, Cleveland, Worcester and Boston.

Zinc Products: Sheet fob mill, 13.15c, 36,000 lb and over deduct 7%. Ribbon and strip 12.25c, 3000-lb lots deduct 1%, 6000 lb 2%, 9000 lb 3%, 18,000 lb 4%, carloads and over 7%. Boiler plate (not over 12") 3 tons and over 11.00c; 1-3 tons 12.00c; 500-2000 lb 12.50c; 100-500 lb 13.00c; under 100 lb 14.00c. Hull plate (over 12") add 1c to boiler plate prices.

PLATING MATERIALS

Chromic Acid: 99.75%, flake, del., carloads 16.25c; 5 tons and over 16.75c; 1-5 tons 17.25c; 400 lb to 1 ton 17.75c; under 400 lb 18.25c.

Copper Anodes: In 500-lb lots, fob shipping point, freight allowed, cast oval over 15 in., 25.125c; curved, 20.375c; round oval straight, 19.375c; electro-deposited, 18.875c.

Copper Carbonate: 52-54% metallic Cu, 250 lb barrels 20.50c.

Copper Cyanide: 70-71% Cu, 100-lb kegs or bbls 34.00c, fob, Niagara Falls.

Sodium Cyanide: 96%, 200-lb drums 15.00c; 10,000-lb lots 13.00c fob Niagara Falls.

Nickel Anodes: 500-2999 lb lots; cast and rolled carbonized 47.00c; rolled depolarized 48.00c.

Nickel Chloride: 100-lb kegs or 275-lb bbls 18.00c lb, del.

Tin Anodes: 1000 lb and over 58.50c del.; 500-999 59.00c; 200-499 59 50c; 100-199 61.00c.

Tin Crystals: 400 lb bbls 39.00c fob Grasselli, N. J.; 100-lb kegs 39.50c.

Sodium Stannate: 100 or 300-lb drums 36.50c, del.; ton lots 35.50c.

Zinc Cyanide: 100-lb kegs or bbls 33.00c fob Niagara Falls.

Scrap Metals

Brass Mill Allowances: Prices for less than 15,000 lb fob shipping point. Add ⅝c for 15,000-40,000 lb; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	12.000	12.000	11.250
Yellow brass	9.875	9.625	9.125
Commercial bronze			
95%	11.250	11.000	10.500
90%	11.125	10.875	10.375
Red brass			
85%	10.875	10.625	10.125
80%	10.875	10.625	10.125
Best quality (71-79%)	10.500	10.250	9.750
Muntz metal	9.250	9.000	8.500
Nickel silver, 5%	10.500	10.250	.....
Phos. br., A, B, 5%	12.750	12.500	11.500
Naval brass	9.500	9.250	8.750
Manganese bronze	9.500	9.250	8.750

Other than Brass Mill Scrap: Prices apply on material not meeting brass mill specifications and are fob shipping point; add ¾c for shipment of 60,000 lb of one group and ½c for 20,000 lb of second group shipped in same car. Typical prices follow:

(Group 1) No. 1 heavy copper and wire, No. 1 tinned copper and copper borings 11.50c; No. 2 copper wire and mixed heavy copper, copper tuyeres 10.50c.

(Group 2) Soft red brass and borings, aluminum bronze 10.75c; copper-nickel solids and borings 11.00c; lined car boxes, cocks and faucets 9.50c; bell metal 17.25c; babbitt-line brass bushings 14.75c.

(Group 3) Admiralty condenser tubes, brass pipe 8.75c; muntz metal condenser tubes 8.25c; old rolled brass 8.25c; manganese bronze solids; (lead 0%-0.40%) 8.00c; (lead 0.41%-1%) 7.00c; manganese bronze borings, 7.25c.

Aluminum Scrap: Price fob point of shipment, truckloads of 5000 pounds or over; Segregated solids, 2S, 3S, 5c lb, 11, 14, etc., 3 to 3.50c lb. All other high grade alloys 5c lb. Segregated borings and turnings, wrought alloys, 2, 2.50c lb. Other high-grade alloys 3.50c, 4.00c lb. Mixed plant scrap, all solids, 2, 2.50c lb borings and turnings one cent less than segregated.

Lead Scrap: Prices fob point of shipment. For soft and hard lead, including cable lead, deduct 0.75c from basing point prices for refined metal.

Zinc Scrap: New clippings 7.25c, old zinc 5.75c, fob point of shipment, add ½c for 10,000 lb or more. New die cast scrap 4.95c, radiator grilles 4.95c, add ½c for 20,000 lb or more. Unsweated zinc dross, die cast slab 5.80c, any quantity.

Nickel, Monel Scrap: Prices fob point of shipment: add ½c for 2000 lb or more of nickel or cupro-nickel shipped at one time and 20,000 lb or more of monel. Converters (dealers) allowed 2c premium.

Nickel: 98% or more nickel and not over ½% copper 23.00c; 90-98% nickel, 23.00c per lb nickel contained.

Cupro-nickel: 90% or more combined nickel and copper 26.00c per lb contained nickel, plus 8.00c per lb contained copper; less than 90% combined nickel and copper 26.00c for contained nickel only.

Monel: No. 1 castings, turnings 15.00c; new clipping 20.000c; solder sheet 18.00c.

Sheets, Strip . . .

Producers unable to estimate closely either fourth-quarter rated tonnage or total production

Sheet & Strip Prices, Page 156

New York — Sheet sellers find themselves still far from being able to make any close approximation of what they will be called upon to supply in the closing months of the year in the way of rated tonnage. Rated business is still coming through in considerable volume and, as a further complication, a number of these rated orders are still coming through from buyers who are not regular customers. Such orders are being returned, but in a number of instances the question of having to supply tonnages involved is still not settled, as consumers are making further appeals to Washington.

Meanwhile, there are operating difficulties at various producing plants, which are making it difficult for producers to even estimate the amount of carryover they are going to have at the end of this quarter. While production stepped up sharply in July and August, it is now tapering off again at certain plants because of shortage of raw materials.

Seattle—Rolling mills are as near capacity as handicaps of scrap shortage and abnormal labor turnover will permit. While mills are booked to the end of the year, demand is so insistent that the entire 1947 production could be sold almost immediately. No new business is being accepted except in particular cases where regular customers must be accommodated or deliveries are extended over a long period.

Birmingham—Priority system is causing some confusion in sheets which are being produced at virtual capacity in this district but still in insufficient quantity to meet demands. The district's 260,000-ton annual capacity will be boosted to about 500,000 tons with the changeover to the cold reduction method just announced by Tennessee Coal, Iron & Railroad Co. The two-year program is considered a great potential boost for the sheet situation here, always one of the tightest in steel specifications.

Cincinnati—Sheet mills are trying to fit into schedules the priority orders recently filed for fourth quarter rolling. The effect on other customers has not yet been accurately defined, but it is certain the carryover into next year will be heavy.

St. Louis—Sheet production in this district is increasing. Granite City Steel Co., principal producer, has completed lease arrangements for three DPC open hearths, which will equalize its pouring and finishing capacity. One furnace has started operation and the other two are to begin by the end of October and possibly sooner. These are in addition to the four open hearths the company owns. Carryover on both hot and cold-rolled sheet orders is expected to run through the first quarter with little likelihood of any open space before the latter part of the second. No new business will be accepted until Jan. 1. Few cancellations have been received, although there have been occasional specification changes.

Preferences given steel for railroad cars and housing on old orders may make delivery of some steel now on the schedules more than nine months late.

Pittsburgh — Nearly 195,000 tons of the 210,000-ton total of rated steel tonnage that has been approved for the fourth quarter to date represents sheets. Not only is bulk of rated orders for sheets, but most of this tonnage is scheduled for October delivery. One interest states very little unrated galvanized tonnage will be shipped next quarter. While about 25 per cent of its cold-rolled sheet output will be for preference orders, some mill customers may have to curtail operations next quarter because of a reduction in their steel allotments due to the fact that a considerable tonnage of rated orders must be given preferred position on mill schedules. In addition to "CC" rated tonnage, mills expect an increasing number of directives resulting from hardship cases. Producers say it is impossible to give any of their customers definite delivery promises as long as overall requirements represented by "CC" ratings and directives are not definitely established. This situation prohibits many metalmaking companies from setting up realistic production schedules.

Philadelphia — Sheet sellers continue to receive a large volume of rated orders, a substantial portion of which is from consumers with whom they had never previously done business. Consequently, this business is not being entered, although it continues to hang over the market. Producers also comment upon the unusual size of a number of the rated orders that are being received from regular customers. In certain instances, these orders for fourth quarter delivery involve more tonnage than specified for the first three quarters combined. Some producers believe that they will have nothing left for quotas originally planned for their unrated customers. This is especially true in galvanized sheets, practically all of which is going into housing.

Steel Bars . . .

Unbalanced inventories of hot-rolled bars restrict cold finishing operations. Carryover to be heavy

Bar Prices, Page 156

Pittsburgh—Cold finishing operations remain well below capacity due to unbalanced inventories of hot-rolled bars. One interest reports inability to make any headway against order backlogs due to restricted output which is estimated at about 70 per cent of capacity. No openings in production schedules are available through remainder of this year, and on smaller sizes some interests are booked through first quarter. A number of customers have submitted orders a year ahead. Heavy demand is noted from all sources although heaviest requirements fall within the size range of 2-in. and under. Mills have not yet opened books for first quarter scheduling, and are not expected to until they have a clearer indication of the amount of rated tonnage they must schedule for fourth quarter and extent of probable carryover tonnage. No appreciable rated

tonnage has been placed with mills to date. Mill carryover tonnage into fourth quarter is expected to represent about two months' output on an average. Shipments on alloy bars are available for late October and November.

St. Louis—Demand for merchant bars continues unchanged at the high level reached three months ago. Production, after reaching what was regarded as peacetime capacity, is beginning to feel the effects of shortages in magnesium, zinc and tin, as well as scrap and pig iron. The latter two have not been critically scarce in mills in this district. Drawers still are uncertain of schedules, but they are virtually sure of a carryover through the first half of next year. New orders are being accepted reluctantly and on a mill-convenience delivery basis. The directive on capacity carloading still complicates shipment schedules forcing further delay in deliveries of the smaller orders.

Chicago — Light carbon bars hold a position second to sheets and strip as regards tightness and deferred deliveries. Return of the use of priorities in fourth quarter complicates the supply problem for the user lacking preferential position and there is widespread fear that priority tonnage will force mills to reduce shipments of steel under quotas. Instances are heard where manufacturing plants operate one shift every other week because of interrupted steel deliveries. One local barmaker has opened books for first half of next year, and in establishing quotas—lower than at present—has taken into account the present large carryover and figured so that estimated carryover at next midyear should not be over one month.

Philadelphia — Hot carbon bar producers, especially now that agricultural equipment requirements no longer will take preference in the fourth quarter, are receiving only a modest amount of rated tonnage for that period. However, it is almost impossible for buyers to place new tonnage for shipment over the remainder of this year, because of the orders already on mill books. As a matter of fact, hot carbon bar sellers generally are far oversold for this year, especially on 1½ inch and smaller sizes. Much of the same situation also prevails in cold-drawn carbon bars. Hot and cold alloy bars are still available in good volume for this year.

Steel Plates . . .

Sellers restrict new bookings to rated tonnages in effort to catch up on arrearages

Plate Prices, Page 157

New York—With backlogs running well into next year, despite the fact that some leading producers have not formally opened their books for next year, plate mills are accepting little tonnage apart from rated specifications. Hence, with practically all sellers many weeks behind on current commitments, major activity is being directed toward getting caught up on arrearages; and at present they are making little headway, especially in view of continued shortages in scrap and pig iron.

Tank fabricators, in turn, are behind on their schedules because of delay in pig shipments, with the majority unable to accept new orders for shipment within the next 12 months.

The major portion of bookings, plate fabricators declare, is for industrial work. There has been a particularly heavy demand for weeks past from manufacturers of rayon and plastics, and there has been substantial increase in demand also for storage silos and bins for installation in connection with conveying equipment to meet labor saving requirements.

Pittsburgh—Fabricators have been unable to make much headway against near record backlogs due to continued dearth in plate supply. Until nearly depleted fabricators' inventories can be augmented, miscellaneous tank, railroad car and barge construction will remain well behind schedules. However, increased tonnage of plates is expected to be channeled into freight car construction and repair programs through remainder of this year as result of CPA's request to meet urgent needs of the carriers. Overall plate demand has held up exceptionally well since the end of the war. Some producers have no openings in rolling schedules until well into first quarter.

Birmingham—Plate commitments are falling slightly behind schedules due to the overall demand for steel products which makes it impossible to give preferential treatment to plates for any substained period. A few limited bookings for next year have been made.

Seattle—Many projects involving plates are pending and others are withheld pending an easier supply. Materials are

unavailable in required tonnages, deliveries are slow and are becoming more uncertain due to the seamen's strike.

Port of Portland has awarded a contract at $472,500 to Northwest Marine Iron Works, Portland, for construction of a 186-foot stern wheel steel tug, requiring about 200 tons of plates.

Portland is studying tenders for a million-gallon elevated steel tank, completion date taking precedence over price. Pittsburgh-Des Moines Steel Co. is low, $114,827, completion in 12 months; American Pipe & Construction Co., Portland bid $117,529, completion in 9 months, and Chicago Bridge & Iron Co., $121,550, completion in 6 to 7 months.

Philadelphia — Already far behind on current commitments, plate sellers are moving cautiously in the acceptance of new tonnage. Certain leading producers still have not opened their books for next year and, being sold out for the remainder of this year, are entering no new business unless it is rated. On the other hand, some producers are booking selected tonnage for 1947, and one, as a result of this policy plus heavy arrearages, regards himself as practically out of the market for the first half of next year. While plate mills are receiving some rated business for the fourth quarter, it has not amounted to much so far.

Wire . . .

Wire Prices, Page 157

Chicago—Inventories of wire and wire products are low and buyers' chief concern is essentially one of deliveries. Although the record harvest of crops is holding back the erection of fences, dealers and jobbers press insistently for deliveries from fencemakers. Demand for bale ties is heavy; some quarters report requirements for ties suitable for baling paper and rags are more acute than for hay. The upholstery trade is pressing for tacks. Railroad purchases of wire are increasing. Wiremakers are confronted with the problem of spreading out customer allocations thinly, with result that few are satisfied.

Tubular Goods . . .

Tubular Goods Prices, Page 157

Boston—For delivery to Dodge City, Kan., in the last quarter, 1947, and first quarter, 1948, Stone & Webster Engineering Corp., Boston, is asking bids with escalator clauses on 20,000 tons of carbon steel, grade B pipe, 4½ to 10¾-inch o. d. Pipe is for gas lines, Stanolind Oil & Gas Co., Tulsa, Oklahoma, installation in western Kansas. Pipe deliveries to distributors are slightly heavier, but demand is active and little tonnage is going into inventories. Mills take light tonnage beyond jobber quotas and are filled well into next year on a month-to-month basis.

Seattle—Cast iron pipe sellers report decreased demand but this is attributed to their inability to promise definite deliveries. The potential demand is sufficient to absorb a very large tonnage of pipe but many large projects are being deferred until production increases, transportation difficulties are resolved, and deliveries can be guaranteed. Vancouver, Wash., is considering bids for 300 tons, various sizes, and the award may be made on the basis of delivery rather than price.

Structural Shapes . . .

Structural Shape Prices, Page 157

New York—Structural awards continue to decline, due largely to restrictions on nonhousing construction. Among the few outstanding awards is a lot of 1000 tons for a warehouse for the Danahy-Faxon Stores, Buffalo, placed through the Turner Construction Co., to Lehigh Structural Steel Co., Allentown, Pa. The New York City Board of Transportation is in the market for several hundred tons for subway platform construction in Brooklyn. Meanwhile construction operations in the metropolitan area have been disrupted by the trucking strike and also by rail embargoes resulting from both the trucking and seamen's strikes.

Boston—Structural steel contracts approximating 25,000 tons are being placed by two Boston contractors, including 17,000 tons, generator plant, General Electric Co., Schenectady, N. Y., by Stone & Webster Engineering Corp. This project will be partially welded. Telephone building, Boston, takes 8000 tons. New inquiry for smaller tonnages has slackened, affected by tightening of authorizations on nonhousing projects, but there is no easing in pressure on structural mills, generally filled well through first quarter with carryover heavy. Deliveries on new fabricated steel contracts extend into April; backlogs with the two major fabricating interests are heavy.

Chicago — Activity in structural fabricating is severely limited by shortage of shapes. Deliveries from mills are slow and are holding back work in progress. Volume also is below quotas, with result that fabricators are not interested in taking on new work. Reflecting this and the government restrictions, new inquiries for building construction have fallen to a low level.

Philadelphia — Shape production sagged last week as a result of a shortage in scrap, resulting in additional arrearages, which already are so heavy that producers see little chance of getting caught up for several months. Meanwhile, structural demand is declining, as a result of tightening restrictions on nonhousing construction. Certain projects on which bids had been taken have been held up indefinitely, including a 4000-ton addition to an eastern Pennsylvania steel mill and a somewhat smaller tonnage for a metalworking plant addition in the same district. However, a few scattered jobs are being placed, having received CPA approval, including 850 tons for Spicer Mfg. Corp.'s Parish Pressed Steel Co., Reading, Pa., placed with Belmont Iron Works, Eddystone, Pa., and 325 tons, addition, Du Pont plant, Edge Moore, Del., placed with Bethlehem Fabricators, Bethlehem, Pa.

Inquiry includes 1300 tons, steam-electric generating station, Warren, Pa., with plans being issued by Gilbert Associates, Reading, Pa.; 180 tons, state bridge, Montgomery county, Pennsylvania, on which J. F. Keelor, Perkiomenville, Pa., general contractor, is low; unstated tonnage, Paulsboro Mfg. Co., Souderton, Pa., on which the Ballinger Co., Philadelphia, is the architect. Bids were opened Sept. 16 on 420 tons for a state bridge in Northumberland county, Pennsylvania, and 125 tons for another in Carbon county, Pennsylvania.

Birmingham — Pressure for shapes, while probably not as great as for sheets and plates, has increased somewhat over the past few weeks, although building operations, except for general repairs and modernization of a comparatively moderate size, are being held at a minimum. Mills expect a new rush for shapes by the turn of the year.

Seattle — Fabricators report a continued tight supply of steel and are turning down business. Allocations are far under normal requirements and present indications are that ample relief will not be at hand for at least six months. Deliveries continue unsatisfactory and will be aggravated by the shipping strike, even if it is not of long duration. Potential industrial demand for shapes is of major proportions but the government moratorium on new awards is restricting the volume of new business. Fabricators are accepting only small orders based on the amount of steel on hand and are not making definite delivery promises. Indicative of conditions, Washington state received no bids last week for a girder bridge in Wahkiakum county.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 157

Chicago — Reinforcing activity continues to drift to lower levels, suppliers being so short of steel they shy away from even the most attractive inquiries. Some interests, far in arrears in mill shipments under quotas, are heavily overcommitted and freely admit they are not interested in taking new business un-

til after Jan. 1. Largely due to steel scarcity, and further cuts by the government in approvals for commercial construction numerous projects are being deferred.

Boston — Substantial tonnage of reinforcing steel is going begging, contractors being unable to find a seller. Stocks and quotas to distributors are small and inadequate and, with production sharply curtailed, prospects for improved supply are not bright. Delays in bridge and highway work are partly due to lack of concrete reinforcing bars. Sellers are booking small lots, husbanding supply in sight, but are reluctant to commit themselves on larger tonnages over an extended period.

New York—Approximately 2500 tons of reinforcing steel are required for the James Weldon Johnson houses, a municipal housing authority project, with Wilaka Construction Co. Inc., 11 East 44th Street, this city, low on the general contract. This tonnage is outstanding in a rather dull reinforcing bar market. Business is restricted by curbs on non-housing construction and by difficulty in obtaining steel and other materials. Some reinforcing steel distributors assert their sources of supply have all but dried up, and ascribe this situation largely to the lack of profit in the production of this item, combined with freight absorption in various instances.

Pittsburgh—Most sellers are operating under substantially restricted production quotas and some are not accepting new orders because their mills are booked solidly through rest of this year. Until producers can more clearly determine extent of year-end carryover tonnage, sellers are not expected to open books for first quarter tonnage scheduling. Some mills are accepting forward orders, but in most instances are not specifying even tentative delivery dates. As long as concrete bars remain a "loss" item, there is little prospect overall output will be substantially increased. Mills find it much more profitable to concentrate on production of carbon bars, thus leaving relatively little opening on bar mill schedules. Many construction programs are being held up indefinitely because of the present dearth of reinforcing bars. Considerable export tonnage also is seeking placement with little success.

Pig Iron . . .

Many small foundries being forced to reduce melt or close down due to inability to get pig iron or coke

Pig Iron Prices, Page 159

New York—While rail embargoes arising from the truck and water strikes have greatly restricted pig iron shipments, most consumers in the metropolitan area have enough iron on hand to carry them over the remainder of the month. However, a number of plants will be forced down before then for the want of coke. In fact, certain foundries late last week were not planning to operate this week for this reason.

Foundries in the Brooklyn area appear to be particularly hard hit not only because the embargo restricts shipments to carlots for delivery only to such plants as have sidings, but because of lighterage, which recently was brought to a standstill as a result of a decision of tugboat crews to walk out in sympathy with the striking seamen's union.

Most pig iron consumers in this district are experiencing further restrictions, as they are unable to obtain certificates for pig iron. This is due to the fact that these foundries are not engaged in work for the housing program or in the manufacture of railroad brake shoes, for which certificates are provided. Farm machinery also has been taken from the preference list, and while only few foundries in this district were engaged in the manufacture of castings for this equipment, these will be unable to obtain preference tonnage. Meanwhile the present certificate plan which was to have expired at the end of this moth, has been extended for the remainder of the year.

Pittsburgh—Direction 13 to M-21, amended Sept. 6, extends CPA's pig iron certified tonnage program through fourth quarter. The new program excludes agricultural equipment manufacturers from the preferred list. Exclusion of agricultural equipment items is not expected to result in any significant reduction in certified tonnage shipments next quarter for this group has not taken much tonnage on this basis. It is estimated that 185,000 tons of foundry and malleable iron will be shipped this month as certified tonnage, equivalent to about 50 per cent of total output. A regulation outlining the exact terms of NHA's pig iron subsidy progress is ex-

peeed soon. Increased output of 90,000 tons monthly is expected to result from this program.

Chicago — Demand for pig iron continues distressingly acute. Most foundries are without appreciable inventories and, therefore, depend upon arrival of shipments for maintenance of operations. Demand for cast products shows no lessening, and the outlook for an increase in iron production is not promising, a situation which will persist so long as steel plants are desperately short of scrap and must use maximum amounts of hot metal to hold their steelmaking rate. One ray of sunshine in an otherwise drab picture is OPA's announcement that cast scrap price ceilings are to be increased, an action that may result in foundries getting a better supply of scrap. However, cast scrap has been short for many months, and the shortage may be actual, rather than due to an unfavorable price condition.

Philadelphia — Because of the large amount of certified orders, such as soil and pressure pipe and sanitary ware, pig iron melt in this district is expected to continue heavy. This likely will be the case, even though there is a shortage of coke, because suppliers are making a point of seeing that sufficient tonnage is available for housing and brakeshoe requirements. Filling of these rated orders will be at the expense of many foundries not engaged in certified production, with their operations restricted or, in some instances, suspended.

Boston—Extension of priority certifications through fourth quarter finds some additional pig iron consumers qualifying, although these are border-line cases. Production is up slightly, but distribution is badly snarled. Some foundries without ratings are down, others are reducing melt or are operating on a high ratio of scrap, where available. Short as scrap is, most foundries are worse off on iron. Steel works keep going on a hand-to-mouth supply. Pipe and malleable shops as well as a few gray iron producers have increased melt slightly. Overall deliveries to New England this month, and probably through fourth quarter, will be the lowest in years.

Cincinnati — Pig iron shipments are lighter this month to foundries not on priority work. The trend is in both northern and southern iron. Furnaces are trying to spread the available tonnage but the situation falls hard on small foundries which have exhausted inventories and are unable to rely in major degree on scrap. All iron stocks are so low that any hesitation in the flow, whatever the cause, would mean almost immediate check in the melt level.

Birmingham—Pig iron continues in alarming shortage and although merchant iron men hear talk of a premium price of around $8 per ton for all iron over and above regular quotas, the move would not mean much where additional output apparently is out of the question. The district is aware of its need for additional iron capacity, but expansion seems quite some distance in the future.

Buffalo — Demand for merchant iron continues to exceed available supplies, but surprise was noted among sellers over a slight easement for prompt deliveries because of varied labor reasons. One top midstate consumer notified the producer to pare this month's shipments as operations were not being pushed because of the uncertain labor outlook. An increased number of foundries also

find that the labor shortage problem has returned to retard production schedules. In some instances, melters find the limited labor supply as much a factor to contend with as that of getting sufficient iron. Except for one high-cost furnace which is idle, producers are of the opinion that the pig iron premium price plan would have little effect in this area as most producers are operating at capacity.

Iron Ore . . .

Iron Ore Prices, Page 158

Cleveland—Shipments of Lake Superior iron ore in August totaled 9,774,442 gross tons compared with 10,731,804 tons in August, 1945, the Lake Superior Iron Ore Association reports. This was a decline of 957,362 tons, or 8.92 per cent, from the like period a year ago. Canadian mines accounted for 234,895 tons compared with 100,028 tons in August, 1945, and in addition the United States total for August, 1945, includes 59,484 tons of Canadian ore.

Shipments for the year to Sept. 1 totaled 33,623,281 gross tons compared with 51,128,672 tons for the like period of last year, a decline of 17,505,391 tons, or 34.24 per cent. Canadian mines shipped 714,743 tons compared with 348,860 tons during the same period a year ago and in addition the United States total for the 1945 period includes 212,208 tons of Canadian ore.

Scrap . . .

Government decision on prices and distribution controls disappoints both sellers and consumers

Scrap Prices, Page 160

New York — Newly announced increases in cast scrap are expected by most leaders in the trade here to result in some improvements in shipments. While there is question as to how long this improvement might last in view of the small amount of cast scrap being produced, it is thought that collectors will be tempted to concentrate more closely on cast grades, and probably at the expense of steel scrap on which no increases in ceiling prices were permitted. It is still too early to gage accurately the effect of unchanged price schedules on the movement of steel scrap. General opinion is, however, that apart from some temporary increase the flow will not vary much from the rate prevailing just before shipments came to almost a dead stop. Restrictions barring the sale of low phos and foundry grades for basic open hearth consumption will cut down on the flow of this material into the Pittsburgh district. A greater proportion of it in the future should move into eastern Pennsylvania and certain other seaboard consuming districts.

Pittsburgh — Reaction to OPA's scrap price decision and supplementary regulations was generally unfavorable among dealers and brokers. Steel producers believe that a relatively insignificant tonnage of scrap, held by dealers pending the price decision, now undoubtedly will be shipped, but it is too early to forecast to what extent the new regulations will encourage future collection

and shipment of scrap to the mills.

Most dealers take the position that collection and preparation spread of $3.50 per gross tons is inadequate, particularly among the smaller interests that haven't modern processing equipment. They also state the 50-cent differential between dealers' and consumers' ceiling prices on unprepared material is not sufficient to stop direct sales to the consumers on a reciprocal basis. Tie-in sales are said to be nearly impossible to police. Fact processors of scrap now must balance shipments with receipts under CPA's inventory control will prevent further hoarding of scrap. However, those dealers taking a more pessimistic outlook state neither OPA or CPA can force them to sell what scrap they have on hand or to collect and process unprepared material at a loss.

Incentive increases, averaging about $4 a ton on cast scrap, should stimulate collection of this urgently needed material for the foundries. Another important feature of the new scrap regulation prohibits the use of electric furnace and foundry grades in basic open hearth operations unless it has been allocated by CPA.

Chicago — Considerable disappointment and gloom has resulted from the OPA announcement that except for cast scrap ceilings will continue unchanged. At the same time, the scrap trade and consumers of steel scrap are skeptical that any program to promote the flow of scrap short of higher prices can produce the results necessary to maintain steelmaking at full tilt during the next few months. On the other hand, there is some point gained in that OPA has finally spoken, thus removing uncertainty over prices. The action in giving cast scrap higher ceilings may well illustrate whether price is as important as some claim it to be. One difference, however, is that cast grades have been short for a much longer period than steelmaking grades, and hoarding may not be as much of a factor.

Cleveland—Steel mill interests as well as scrap sellers were greatly disappointed last week by provisions of OPA's scrap program. Consensus is that nothing constructive was accomplished toward stimulating the flow of material and that the program as a whole is contrary to recommendations made by the industry advisory committee. It is believed that establishment of ceiling prices on sales of unprepared scrap to dealers from industrial or government sources will reduce sharply the shipment of this type of material. Scrap interests claim that the margin of profit, if any, on most transactions is so small that there is no incentive to bring out supplies. The movement of scrap in this district is light with no prospects of improvement in the near future.

Seattle—Activity in the scrap market remains dull here. Unless heavier tonnages are forwarded steel mills may have to close before the end of this year. Inventories are being depleted gradually and the outlook is unfavorable for the mills which have unprecedented demand for all of their products. Local agencies which successfully conducted a campaign during the war to collect scrap are being reorganized to publicize the plight of the industry and to uncover dormant supplies. Similar campaigns are planned in other sections of the state and in Oregon.

Birmingham—Activity in scrap dealers' yards here was confined last week to the continued accumulation of moderate tonnages. Refusal of OPA to lift ceiling prices, coupled with a labor shortage and advent of inclement weather, will further aggravate tightness of supplies.

Buffalo — Although the OPA's refusal to increase ceilings on steelmaking grades of scrap met with considerable disappointment and resentment among dealers, there was a lively resumption in the movement of accumulated material. New buying was reported also with one of the leading dealers accepting a 10,000-ton order. Dealers attributed the immediate flurry in shipments to the fact that scrap has been held back for weeks in anticipation of higher prices, and that shipments would again hit a low ebb in about two to three weeks.

Many dealers bitterly criticized the OPA's action, pointing out that steel grades needed a price incentive rise more than cast grades because the latter had been selling on a $20 shipping point basis. Steel grades were not. Doubt was also expressed that regulations could do away with reciprocal deals which are completed verbally and are not mentioned in contracts. This area is reported to have shared in a recent deal where a consumer exchanged 15,000 tons of scrap for 10,000 tons of pig iron. A 5000-ton boatload of scrap from the Duluth area was reported during the week.

Philadelphia — Scrap dealers, keenly disappointed over OPA's action in rejecting an appeal for higher prices, look for little or no improvement in the flow of this material. In fact some look for a smaller movement than ever shortly in steel grades. They point out that during the interim period when OPA was not operating and in the few weeks which immediately followed they paid more to collectors than they would have otherwise on the possibility of higher ceiling prices to consumers. Now they are naturally starting to offer less and they expect as a result that collections of merchant scrap will begin to decline, possibly offsetting the slow but gradual improvement in the volume of manufactured scrap.

In any event, the scrap trade looks for a critical period this winter, with stocks virtually nil in many instances. The trade approves certain regulations, including the restriction on the sale of low phos and cast grades for basic open hearth production, and this will prove to the advantage of some consumers in this district who have been losing out indirectly through competition with mills outside the district who have been willing to pay the premiums. However, it sees little point to the inventory controls as now proposed. Higher prices on cast grades should result in at least some temporary improvement, although the cast grades are primarily so very scarce that there is question as to whether these increases will be of lasting benefit.

Warehouse . . .

Warehouse Prices, Page 158

Pittsburgh—Status of warehouse steel tonnage on mills' fourth quarter production schedules still remains uncertain. As matters now stand, steel distributors cannot use their customers' CC ratings as a basis of obtaining steel from the mills. Slight improvement in mill deliveries to warehouses for the last six weeks has not been uniform throughout the range of steel products, with very little increase

noted in galvanized, light-gage hot and cold-rolled sheets, small sized bars, wire items and most structurals. Warehouse stocks of cold-finished bars, bars 2-in. and over, plates and alloys are in fair shape. Most steel distributors state overall inventories have declined steadily throughout each month this year, and in some instances are lowest on record. Many warehouse customers continue to operate well below capacity because of the critical shortage of many steel items and in spite of fact they frequently accept substitute specifications.

Chicago — With inventories declining steadily, warehouses are pressing steelmakers in their attempt to acquire material of any kind. Unable to obtain adequate amounts of steel from mills, consumers do not hesitate to purchase from distributors whatever they can get to maintain plant operations at highest possible levels. Reports are heard in the trade occasionally of sheets being available at prices ranging from 8 to 12 cents a pound, but like all black market operations, such stories are difficult to confirm.

Philadelphia — Jobbers are expressing concern over prospects for receiving mill shipments in the fourth quarter. While some are faring very well in the current quarter and some are experiencing record-breaking months, they see no such outlook for the final three months of this year, since the present directive under which mills must deliver minimum tonnages is due to expire Sept. 30. Due to the heavy rated demand upon the mills for sheets for the fourth quarter, they see little likelihood of receiving anything like the same tonnage in that product. On plates, shapes and bars, which are being subjected to less rated pressure at the mill level, they feel les pessimistic.

Seattle—Sipments of steel to warehouses are being impeded by the seamen's strike. Demand for all products is far in excess of supply. Reinforcing bars, sheets, wire and pipe are the most critical items, some unavailable for months. Other stock items are not so tight, but as quickly as they arrive they are forwarded to the job. Consequently, it is impossible to increase inventories. Warehousemen anticipate little improvement for six months or more.

St. Louis—Warehouses continue to lose ground on inventories, with sales consistently exceeding receipts. Sizes are extremely unbalanced, and shipments, threfore, are expected to decline the rest of the year. Receipts have gained some since the strike wave but not as anticipated. Incoming tonnage so far is only 65 to 70 per cent of what had been expected. Warehouses probably will receive in 1946 a tonnage equivalent to two-thirds that of a normal year. Sheets and strip are virtually nonexistent and smaller structural shapes, bars and bar shapes only a trifle more plentiful. Alloy steels are in best supply. Consumers still attempt to place mill-size orders with warehouses, demanding in some cases tonnage exceeding a warehouse's annual receipts.

Cincinnati—Warehouse stocks will be in poor position to meet demands in the fourth quarter in case of a decline in replacements from mills. On some steel the inventories are adequate, but deliveries keep pace with arrivals in sheets, small bars and structural items. Moreover, jobbers have just about exhausted possibilities of substitute specifications.

Rails, Cars . . .

Track Material Prices, Page 157

New York — While new car orders have declined recently, this situation may be only temporary as several sizable lists are pending with still others under contemplation. Domestic freight car buying in the last two months has been unusually active, and car builders do not see the end immediately in sight. Meanwhile there is considerable pressure for car steel, for the completion of orders being scheduled to have been wound up by this time. Considerable export demand is in the background, the latest involving 2000 freight cars and an unspecified number of steel passenger cars for Mexico; however, foreign demand at this time is receiving relatively scant attention, with interest being devoted principally to the speeding up of highly pressing domestic requirements, especially box cars and in perhaps somewhat lesser degree, hopper cars.

Birmingham — Car inquiry continues active. The Pullman company's Bessemer plant, well booked into the new year, is interested in an inquiry from Southern Pacific for 1000 cars and has other prospective business. Rail bookings are limited only by the ability of the Ensley mill to accept the offerings with anything like a reasonable delivery date.

Philadelphia — Car builders continue to be seriously handicapped in their operations by lack of steel. So far as can be learned, no preference has been given car builders by CPA, although the matter has been under urgent discussion for some time, particularly at the instance of the Office of Defense Transportation which has been stressing the acute shortage of cars. Significant of the difficulty car builders are having in obtaining raw materials is the fact that August shipments of freight cars of only 5141 were the largest this year, 4234 having been shipped by commercial shops and 907 by railroad shops. In addition, 68 passenger cars were completed in that month.

According to the American Railway Car Institute, 9530 cars were placed by domestic lines in August compared with 15,236 in July and only 19,042 for the entire first six months of the year. Of the August bookings, more than 7300 cars were placed with commercial shops, it is understood.

Illinois Terminal has placed 150 fifty-ton box cars with American Car & Foundry Co., New York.

Tin Plate . . .

Tin Plate Prices, Page 157

Pittsburgh—Fourth-quarter tin plate output should be at the year's high, slightly exceeding the relatively large production indicated for the current period. Reduction in the amount of tin plate to be channeled into containers for perishable foods, pharmaceuticals and related items to 70 per cent of monthly output will make available more tin plate for B and C items. Manufacturers of these latter items have undergone severe hardships in attempting to maintain output on their slim share of 15 per cent of tin mill products available for general distribution. No significant improvement in overall pig tin supply has developed to date, so there is little prospect that tin plate conservation measures will be relaxed this year. Some improvement in the supply of box cars is noted; however, supply remains in close balance with immediate needs and there is little prospect of further improvement through early fall months. Seasonal demand for food packs have passed their peak, but there will be no recession in overall tin plate demand the remainder of this year with requirements for B and C items more than taking up the slack.

Certification Plan for Pig Iron Modified by CPA

Manufacturers of housing products and railroad brakeshoes have been authorized by the Civilian Production Administration to certify their orders for pig iron during the fourth quarter.

The revised certification plan, however, has discontinued aid to manufacturers in obtaining iron castings. CPA believes that such assistance as may be necessary can be obtained through the regular procedure of applying for "CC" ratings under direction 18 to priorities regulation 28.

Farm machinery products also have been eliminated from the fourth quarter certification plan as it was considered that these products are not as critically needed as housing products during the balance of the year.

Any manufacturer who receives a rated order from his customer is prohibited, under terms of direction 16 to priorities regulation 3 as amended, from extending this rating to purchase pig iron. Priorities assistance for pig iron will be assigned only under direction 13 to M-21.

Read Workers' Letters, GE President Advises

A recommendation that businessmen spend a little more time "hanging over the back fence" and getting in touch with the rank and file of working people was made by C. E. Wilson, president, General Electric Co., last week at the rededication of the General Electric Institute at Nela Park, Cleveland,

Mr. Wilson suggested that businessmen make a practice of reading letters which come in from employees. "You will be annoyed, infuriated, baffled, pleased and occasionally inspired, but you will learn what people think of business . . . .

"The most important thing that you will learn is that many factory workers have a surprisingly good understanding of the laws of supply and demand, and of the relation of costs to prices, whereas many professional people, who comprise the opinion forming groups, are shockingly ignorant of these matters and have little conception of the historic and transcendent role of the system of free enterprise in American economy."

The rededication ceremonies marked the reopening of the rebuilt and re-equipped institute following wartime interruption of its activities and coincided with the 25th anniversary of its establishment

as a headquarters for information, education and special training in the latest methods and equipment for the production and use of electrical lighting. Since its establishment, more than a million people have visited the institute.

New Price List Issued for Swedish Sponge Iron Powder

A new price list for Hoeganaes sponge iron powder, inported from Sweden, has been set up by Ekstrand & Tholand Inc., 441 Lexington Ave., New York city. Importation of Swedish sponge iron powder was suspended during the war, but by early this year was resumed on an increasingly important commercial scale.

Under the new schedule, the company is now quoting prices for the material packed in special ocean paper bags only, and listing the extras applicable for the bags crated and for shipping of material in iron drums, when drums are available.

Quality "A" is quoted 7.40c per pound, packed in ocean bags, and "AA" at 8.00c per pound, both 100 U. S. mesh, maximum, cif New York, duty paid, carload lots. Specifications for quality "A" are: SiO_2, 0.2 per cent, maximum; C, about 0.2 per cent; loss in hydrogen, 1.50 per cent maximum; Fe, 97 per cent plus; density, 2.4 or 2.7. Specifications for quality "AA" are: SiO_2, 0.2 per cent maximum; C, about 0.2 per cent; loss in hydrogen, 0.7 per cent maximum; Fe, 98 per cent plus; density, 2.4 or 2.7.

Extras are: For bags in crates, 0.5c per pound; for iron drums, 1.1c per pound; for quantity: Lcl to 2240 lb, 0.50c; 2239 to 250 lb, 2c; 249 to 100 lb, 3.50c; x 99 to 50 lb, 4c; under 50 lb, 5c.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1800 tons, office building, Mobile, Ala., for Doullut & Ewin, to Ingalls Iron Works, Birmingham.

1200 tons, plant, Norfolk, Va., for U. S. Gypsum Co., to Lackawanna Steel Construction Corp., Buffalo; bids Sept. 4.

1000 tons, warehouse, Danahy-Faxon Stores, Buffalo, placed through Turner Construction Co., with the Lehigh Structural Steel Co., Allentown, Pa.

930 tons, office building, Mobile, Ala. for Waterman Steamship Lines, to Ingalls Iron Works, Birmingham.

650 tons, regulation gate for spillway, Davis dam, Louise, Ariz., for U. S. Bureau of Reclamation, to Consolidated Steel Corp., Los Angeles.

500 tons, board mill, Natchez, Miss., for Ford, Bacon & Davis Inc., New York, to Ingalls Iron Works, Birmingham.

500 tons, hangar, Seattle, for Northwest Airlines, to Pacific Car & Foundry Co., Seattle.

126 tons, substation, Spec. 1449, Araby, Ariz., for U. S. Bureau of Reclamation, to Tulsa Boiler & Machinery Co., Tulsa, Okla.; bids Aug. 30.

104 tons, bridge, F-113(S), Knox county, Neb., for state, to Omaha Steel Works, Omaha; bids Aug. 1.

STRUCTURAL STEEL PENDING

1000 tons, factory building, Bellwood, Ill., for Chicago Screw Co.

390 tons, building, Pasadena, Tex., for Ebasco Services Inc.

154 tons, bridge, Sec. 136 F-2, Cache, Alexander county, Ill., for state; Illinois Steel Bridge Co., Jacksonville, Ill., low on bids July 26; bids rejected.

149 tons, bridge, Sec. 1-F, McLean county, Ill., for state; Illinois Steel Bridge Co., Jacksonville, Ill., sole bidder on bids Aug. 27; bids rejected.

120 tons, bridge, Sec. 43-F, Pike county, Ill., for state; Illinois Steel Bridge Co., Jacksonville, Ill., sole bidder on bids Aug. 27; bids rejected.

REINFORCING BARS . . .

REINFORCING BARS PLACED

515 tons, No. 2 toll office building, Chicago, for Illinois Bell Telephone Co., to Concrete Steel Co., Chicago; A. Fuller Co., Chicago, contractor; bids Aug. 12.

200 tons, new food market and warehouse, Danahy-Faxon Stores Inc., Buffalo, to the Truscon Steel Co., Youngstown, O.

100 tons, men's dormitory, College of Puget Sound, Tacoma, Wash., to Northwest Steel Rolling Mills, Seattle.

100 tons, Washington state highway projects, to Northwest Steel Rolling Mills, Seattle.

REINFORCING BARS PENDING

2500 tons, James Weldon Johnson houses, for New York City housing authority, Wilaka Construction Co. Inc., 11 East 44th Street, low on the general contract.

1100 tons, tunnel, Whiting, Ind., for Standard Oil Co. of Indiana.

PIPE . . .

STEEL PIPE PENDING

Unstated, about 40,000 feet, 36-inch steel pipe for Olympia, Wash., alternate concrete pipe; Morrison-Knudsen Co., Seattle, low for steel, $1,574,151.

PLATES . . .

PLATES PENDING

200 tons or more, 186-foot, stern wheel tug for Port of Portland, to Northwest Marine Iron Works, Portland, Oreg.

Unstated, million-gallon elevated steel tank, Portland, Ore.; Pittsburgh-Des Moines Steel Co., low, $114,827, completion 12 months.

RAILS, CARS . . .

RAILROAD CARS PLACED

Chicago & North Western, 46 streamlined passenger cars, to Pullman-Standard Car Mfg. Co., Chicago; the list includes 27 coaches, 9 parlor cars, 4 baggage-rail cars, 4 tap-diner lounge cars, 1 cafe-coach and 1 dining car.

RAILROAD CARS PENDING

Central of Pennsylvania and Lehigh & Hudson River, twenty-eight 70-ton covered hopper cars, inquiry issued jointly.

Mexican State Railways, 2000 freight cars and an unspecified number of steel passenger coaches, bids asked.

Missouri Illinois, 150 seventy-ton cars, including one hundred 41-foot 9-inch hopper cars, thirty-five 41-foot 9-inch covered hopper cars and fifteen 35-foot 2¾ inch covered cement cars.

St. Louis-San Francisco, 3 new passenger trains, including 38 coaches and three 4000-horsepower Diesel locomotives, and also 300 automobile cars, federal court approval requested for purchase of equipment estimated to cost approximately $7,346,000.

LOCOMOTIVES PLACED

Gulf, Mobile & Ohio, one 1500-horsepower Diesel-electric freight engine, to the Ingalls Shipbuilding Corp., Birmingham, Ala.

LOCOMOTIVES PENDING

Clinchfield, four to eight 4-6-6-4 type steam locomotives, bids asked.

CONSTRUCTION AND ENTERPRISE

ALABAMA

BIRMINGHAM—Frisco Lines, 107 N. 20th St., has plans to construct a $246,000 warehouse.

DECATUR, ALA.—Calumet & Hecla Consolidated Copper Co., Wolverine Tube Division, Calumet, Mich., has awarded contract for copper tubing and copper products plant to Foster-Creighton Co., American National Bank Bldg., Nashville, Tenn. Plant is estimated to cost $3 million. Howard, Hickerson & Dinkins Inc., 304½ Third Ave., Nashville, is the architect.

CONNECTICUT

DANBURY, CONN.—Bieber-Goodman Corp., E. Liberty St., has awarded contract for two-story, 50 x 175-foot factory to B. J. Dolan, 207 Greenwood Ave., Bethel, Conn., at an estimated cost of $100,000. LaCava & Campbell, 248 Main St., are architects.

HARTFORD, CONN.—G. F. Heublein & Brother Inc., 330 New Park Ave., has awarded contract for two-story, 105 x 300-foot factory to Wadhams & May Co., 15 Lewis St., for an estimated $300,000. Fletcher Thompson Inc., 211 State St., Bridgeport, Conn., is the architect.

DELAWARE

WILMINGTON, DEL.—E. I. duPont de Nemours & Co. Inc., Nemours Bldg., has plans to construct an experimental station expansion at a cost of $17,000,000. Jaros, Baum & Bolles, 415 Lexington Ave., New York, are engineers. Plans have been drawn by Voorhees, Walker, Foley & Smith, 101 Park Ave., New York, and F. A. Godley, 247 Park Ave., New York, associate architects.

GEORGIA

MACON, GA.—Welding Supplies Inc., c/o C. W. Farmer, president, is planning construction of an oxygen and acetylene gases manufacturing factory to cost $100,000.

INDIANA

COLUMBUS, IND.—Cummings Engine Co., C. L. Cummings, president, Columbus, has awarded contract for design and construction of one-story, 60 x 175-foot factory addition; one-story, 55 x 60-foot oil bulk station; pump house; oil distribution system; warehouse and office to the Austin Co., Euclid Ave., Cleveland, to cost an estimated $120,000.

GARY, IND.—National Tube Co., Gary, has awarded contract for one-story seamless tube rolling mill addition to Aetna Standard Engineering Co., Home Savings & Loan Bldg., Youngstown, for an estimated $700,000.

IOWA

BROOKLYN, IOWA—City has awarded a contract to Fairbanks Morse & Co., Omaha, Nebr., for improvements to the municipal power plant to cost $55,000.

CHARLES CITY, IOWA—Salsbury's Laboratories, J. E. Salsbury, president, has awarded the contract for erection of a $600,000 manufacturing plant to Rye & Henkel, Mason City, Iowa. Hansen & Waggoner, Mason City, are architects.

LOUISIANA

DELHI, LA.—Sun Oil Co., 1608 Walnut St., Philadelphia, has awarded separate contracts for a natural gas processing plant to cost $1 million. Petroleum Engineering Co., Commerce Bldg., Houston, Tex., is engineer.

MINNESOTA

MINNEAPOLIS—Standard Iron & Wire Works, H. Z. Demeules, 1900 Northeast Third St., will let a contract for a one-story, 100 x 200-foot factory at 30th Ave. N. and Second St. to cost $110,000. Armstrong & Schlichting, 1409 Willow St., are architects.

ST. PAUL—Huot Mfg. Co., 128 E. Tenth St., has awarded general contract for one-story, factory at Wheeler St. and Charles Ave. to Saures Construction Co., 1543 W. Larpenteur Ave., to cost approximately $58,000.

MISSISSIPPI

JACKSON, MISS.—The Taylor Machine Works, Jackson, will build a 1½-story machine shop to cost $75,000.

OHIO

ASHTABULA, O.—Electro Metallurgical Co., Lake Rd. E., has placed into operation its third carbide furnace since purchase of the plant property from WAA.

CANTON, O.—Babcock Printing Press Corp., New London, Conn., will begin operation soon of the former Dayton Malleable Iron Co. plant on Waynesburg Rd. S. E., recently purchased from WAA for $200,000. High speed, rotary magazine color presses will be built in the plant.

CINCINNATI—B. C. Home Air Conditioners, 1822 Sycamore St., has been formed by Sam. J. Capozzolo and John P. Banbach and will specialize in designing and fabricating air conditioning ductwork for homes, shops and offices.

CLEVELAND—Durolet Mfg. Co. has been formed by Sam Stryffeler, 10106 Nanford Ave., to manufacture electric conduit fittings. The company will be located at 6321 Detroit Ave. when the present occupant leaves in the next few weeks.

CLEVELAND—Aluminum Coating Manufacturers Inc., 16710 Waterloo Rd., has been incorporated through Peter L. Horwitz, Engineers Bldg., to manufacture coatings of all kinds.

CLEVELAND—General Electric Co., 1734 Ivanhoe Rd., has leased two connecting two-story buildings at 5810 Euclid Ave. which will be used for assembly of vacuum cleaners.

CLEVELAND—Chase Brass & Copper Co., Cleveland, has purchased the government-owned plant at 1121 E. 260th St., Euclid, O., operated by the company during the war. The plant, site and equipment was bought from WAA for $5,012,322. The plant will be equipped to manufacture sheet brass.

CLEVELAND—Westover Corp., formed by James F. Preston Jr., Union Commerce Bldg., will manufacture, process and fabricate sheet metal cabs and vehicles, cabinets, trays and panels.

CLEVELAND—Cleveland Electric Illuminating Co. has announced a three-year expansion program involving $30 million, which will include installation of a 90,000 kw generator.

GIRARD, O.—Syro Steel Co., 1123 Tod Ave., has been incorporated and will manufacture patented steel nailer beams. Andrew E. Syak, same address, is president.

LAKEWOOD, O.—Jack & Heintz Precision Industries Inc., 17600 Broadway, Maple Heights, O., has awarded contract for a one-story, 60 x 200-foot, storage and receiving addition at W. 117th St. to Stremple Construction Co., 17500 Broadway, Maple Heights, for $70,000. Wilbur, Watson & Associates, 4614 Prospect Ave., Cleveland, are engineers.

MALVERN, O.—Malvern Steel & Forge, newly organized, has been formed to be a flat hammer forging shop, specializing in tool steel and special steel for the auto and tool industries. A plant will be constructed in Malvern next spring. R. S. Rieman, 14263 Roselawn, Detroit, is associated with the firm.

STEUBENVILLE, O.—Wheeling Steel Corp., Wheeling Steel Corp. Bldg., Wheeling, W. Va., is reported to be negotiating with city officials to purchase the Ohio river waterfront from Adams street south to the company's property.

YOUNGSTOWN—Youngstown Sheet & Tube Co. is planning to build a $57,810 extension to the present machine shop building at the Campbell plant. Cost quoted is for structural work only and does not include any additional machinery which is to be installed.

OREGON

PORTLAND, OREG.—Willard Storage Battery Co., E. 131st St., Cleveland, has awarded contract for a one-story, 150 x 360 foot storage battery factory at N. W. 35 and Yeon Ave. to Donald M. Drake Co., Lewis Bldg., Portland, for $300,000. Amand & Kennedy, Central Bldg., are architects.

PORTLAND, OREG.—Starr Fruit Products Co. plans construction of a $1,000,000 cannery plant to replace present factory. Equipment will cost $450,000.

PENNSYLVANIA

BRIDGEPORT, PA.—Owner, c/o B. Price, 1911 Pine St., Philadelphia, will soon let contract for a factory addition to cost $60,000.

BRIDGEVILLE, PA.—Universal Cyclops Steel Corp., Bridgeville, has awarded contract for a one-story, 65 x 95-foot, 2-story, 25 x 140-foot steel mill addition to Fort Pitt Bridge Works, Keystone Hotel, Pittsburgh, at an estimated $60,000.

CORAOPOLIS, PA.—Russell Birdsall & Ward have awarded contract for one-story, 53 x 145-foot factory to Frazier Co., 95 S. Sixteenth St., Pittsburgh, at a cost of about $55,000. R. L. Patillo, 5914 Walnut St., Philadelphia, is the engineer.

LANSDALE, PA.—Philco Corp., Lansdale, has postponed indefinitely plans to construct a laboratory and engineering building which was to have been built at a cost of $150,000.

MEADVILLE, PA.—American Brake Shoe Co., Meadville, has let $55,000 contract for one-story bearing manufacturing plant for National Bearing Metal Division to Ragnar Benson Co., 4744 W. Rice, Chicago. J. Gordon Turnbull Inc., 2630 Chester, Cleveland, is the engineer.

PHILADELPHIA—Colonial Iron Craftsmen, 1332 S. 9th St., has asked that bids be submitted for a shop and office building to cost about $55,000. J. L. Stesler, Woodside and Montgomery Aves., Ardmore, Pa., is the architect.

TEXAS

DALLAS, TEX.—Alford Terminal Warehouses, Industrial Blvd., has begun clearing a 60-acre site for construction of a $2 million warehouse project to consist of two units, 220 x 1500 feet.

MIDLAND, TEX.—Frontier Chemical Co. plans construction of $500,000 electrochemical manufacturing plant to manufacture hydrochloric acid and caustic soda.

HOUSTON, TEX.—Anchor Post Fence Co. of Texas, C. B. Stillinger, manager, plans to build a one-story warehouse and office building at 1305 Gentry St.

WASHINGTON

SEATTLE—Rossoe Mfg. Co., 413 Fairview Ave. N., has awarded contract for two-story, 60 x 160-foot, oil burner manufacturing plant addition to O. Boen, 661 E. Northlake St., for $60,000. S. Ivarsson, Skinner Bldg., is the architect.

WISCONSIN

WEST ALLIS, WIS.—LeRoi Co., 1706 S. 68th St., has awarded contract for one-story, 50 x 400-foot factory addition to Klug & Smith Co., 111 E. Wisconsin Ave., Milwaukee, for an estimated $224,000.

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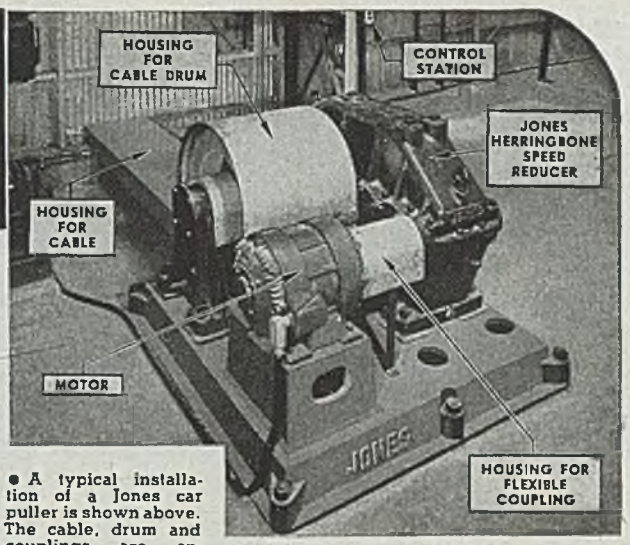

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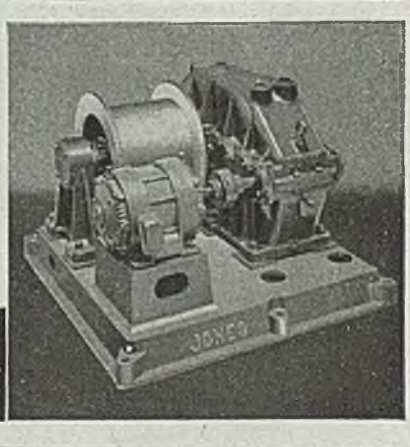

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3/8	68" x 240"	1,639 Lbs.
3/8	72" x 288"	10,418 Lbs.
3/8	73" x 384"	8,449 Lbs.
3/8	74" x 246"	27,432 Lbs.
3/8	75" x 264"	39,785 Lbs.
3/8	75" x 360"	2,713 Lbs.
3/8	77" x 246"	13,323 Lbs.
3/8	78" x 270"	10,732 Lbs.
3/8	78" x 300"	2,350 Lbs.
3/8	80" x 312"	10,031 Lbs.
3/8	84" x 240"	24,306 Lbs.
3/8	84" x 336"	17,015 Lbs.
3/8	93" x 354"	23,155 Lbs.
3/8	96" x 240"	4,628 Lbs.
3/8	60" x 336"	13,283 Lbs.
3/8	64" x 360"	29,259 Lbs.
3/8	70" x 264"	32,474 Lbs.
3/8	72" x 384"	3,036 Lbs.
3/8	74" x 336"	11,120 Lbs.
3/8	75" x 300"	9,886 Lbs.
3/8	76" x 276"	57,597 Lbs.
3/8	78" x 252"	12,954 Lbs.
3/8	85" x 252"	2,352 Lbs.
3/8	96" x 261"	5,504 Lbs.
3/8	96" x 264"	16,699 Lbs.
3/8	98" x 288"	8,849 Lbs.
13/32	50" x 252"	1,499 Lbs.
1/2	60" x 360"	158,148 Lbs.
1/2	66" x 318"	21,517 Lbs.
1/2	78" x 360"	57,568 Lbs.
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Statement of Ownership

STATEMENT OF OWNERSHIP

Statement of the ownership, management, circulation, etc., required by the Act of Congress of Aug. 24, 1912 and March 3, 1933, of STEEL, published weekly at Cleveland, O., for Oct. 1, 1946. State of Ohio, county of Cuyahoga, ss. Before me, a notary public in and for the state and county aforesaid, personally appeared Geo. O. Hays, who, having been duly sworn according to law, deposes and says that he is the Business Manager of STEEL, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of Aug. 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal laws and regulations, to wit: 1.—That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, The Penton Publishing Co., 1213 West Third St., Cleveland 13, Ohio. Editor, Irwin H. Such, 1213 West Third St., Cleveland 13, Ohio. Managing Editor, None. Business Manager, Geo. O. Hays, 1213 West Third St., Cleveland 13, Ohio. 2.—That the owner is The Penton Publishing Company, Cleveland, Ohio. Names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock: Edwin C. Barringer, Washington, D. C.; Samuel E. Bool, Cleveland, Ohio; Richard M. Bourne, Cleveland, Ohio; County National Bank of Santa Barbara, Santa Barbara, Calif.; J. R. Dawley, Cleveland, Ohio; Ernest C. Dempsey, Richard Ingris & Central National Bank of Cleveland as Trustees under agreement with John A Penton dated Feb. 16, 1924, Cleveland, Ohio; The Fanner Manufacturing Co., Cleveland, Ohio; George O. Hays, Cleveland, Ohio; Russell C. Jaenke, Cleveland, Ohio; S. H. Jasper, Pittsburgh, Pa.; A. L. Klingeman, Cleveland, Ohio; E. C. Kreutzberg, Washington, D. C.; Parmess & Co., Cleveland, Ohio; J. D. Pease, Mount Dora, Florida; L. E. Penton, Los Angeles, Calif.; E. L. Shaner, Cleveland, Ohio; Charles J. Stark, Cleveland, Ohio; Penelope M. Stark, Cleveland, Ohio; E. L. Werner, Cleveland, Ohio; Grace Whelan, Santa Barbara, Calif. 3.—That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None. 4.—That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him. 5.—That the average number of copies of each issue of this publication sold or distributed through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is 18,227. Geo. O. Hays. Sworn to and subscribed before me this 3rd day of September, 1946. (Seal) R. W. Coleman. (My commission expires Dec. 26, 1947.)

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WANTED: PRODUCTION ENGINEER WHO IS qualified to arrange machinery and welding equipment, both hand and automatic, to get maximum production on various sizes and thicknesses of A.S.M.E. Code tanks, towers and other items fabricated from sheets and plates. Must have past record in sheet and steel plate fabricating shop. Address Box 623, STEEL, Penton Bldg., Cleveland 13, O.

WANTED: SALESMAN BY IMPORTANT manufacturer of tubing, both seamless and welded, carbon, alloy and stainless steels. Must have mechanical or metallurgical engineering college degree, or suitable alloy steel field sales experience. Give full particulars with application. Address Box 683, STEEL, Penton Bldg., Cleveland 13, O.

SALES PROMOTION MANAGER—EXPERIenced in bar sales including tool steels, shock-resisting steels, S.A.E. alloys, to establish territories and representation for mid-western steel company. Write fully, age, experience, salary requirements. Address Box 690, STEEL, Penton Bldg., Cleveland 13, O.

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PLANT ENGINEER OR SUPERINTENDENT of Maintenance—Registered Professional Mechanical Engineer with wide experience in tonnage and specialty steel mills, plant layout, design, and specifications, construction, maintenance supervision, and contracting engineering. Desires position with progressive firm, preferably in Pittsburgh district. Address Box 664, STEEL, Penton Bldg., Cleveland 13, O.

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