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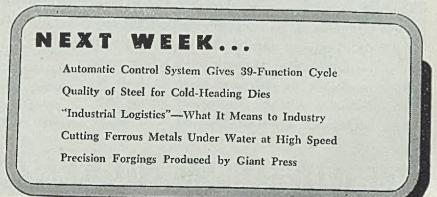
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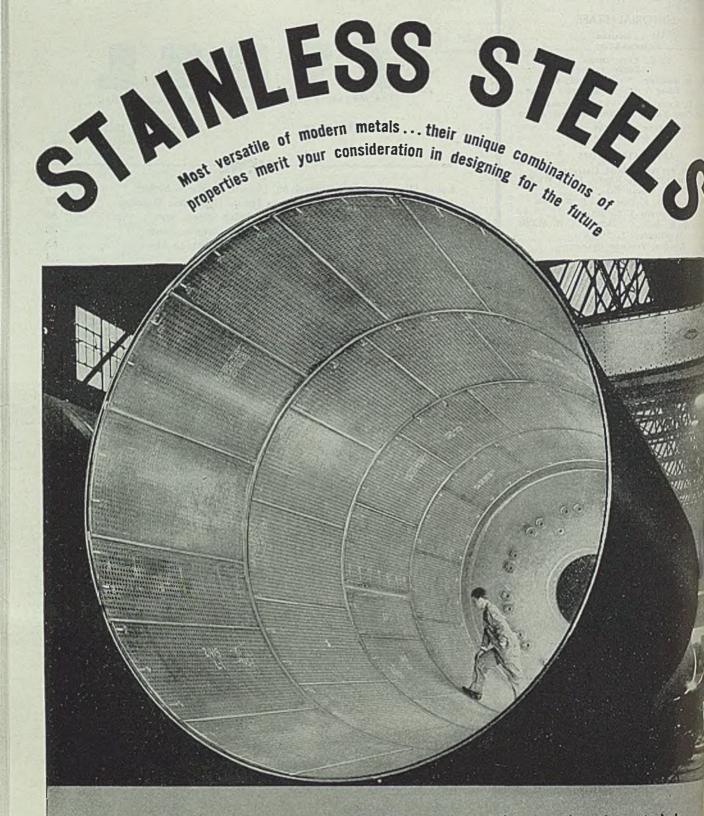
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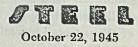




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Disappointing Policy

Last week in New Haven and New York, John W. Snyder, director of the Office of War Mobilization and Reconversion, delivered addresses which may be construed as official statements of the government's viewpoint on vital problems of reconversion.

Mr. Snyder pointed out that we need not worry about our ability to produce. We have the "know how," plant, equipment, labor and finances in abundance. Nor need we be concerned about initial demand, he said. The people want to buy things that have been denied them during the war. They have \$126,000,000,000 in liquid assets with which to purchase goods. Also world rehabilitation represents a tremendous demand for American products.

However, declared Mr. Snyder, this spending power will be used freely only as long as people have confidence in the future. If too many wage earners are unemployed for too long a period or if they are employed at too low wages, they will curtail purchases. The nation's task is to maintain production and jobs at high levels at the same time the line is held against inflation.

Right now, he continued, many workers have gone from a 48-hour to a 40-hour week, incurring a drop in pay of 23 per cent. Meanwhile the prices they must pay for food, shelter and clothing remain unchanged. "Squeezed in that vise, the worker can do only two things—either he gets more money or he has to reduce his standard of living." With the latter, he will buy less and manufacturers will feel it ultimately in reduced orders.

However, (and this is the meat of Mr. Snyder's discussion) whether wage increases can be granted, and to what extent, can in the final analysis only be judged by asking a common-sense question: How much of an increase can the individual company afford to pay if it is to meet its payrolls and stay in business?

Apparently this is to be the basis of government policy---to promote wage increases up to the ability of the individual company to meet them and to hope that relief in the form of higher prices in some instances, of reduction of excess profits taxes and of increased efficiency will assist employers in absorbing the wage increases.

This makeshift policy is disappointing. It is indefinite. Worst of all, it calls for continued controls by government which cannot avoid dulling private initiative.

The nation must have something more concrete and realistic if it is to tackle reconversion effectively.

MORE RECRUITS NEEDED: Industry is putting up a strong fight against the proposal by

critics of the patent system that licensing of patents be made compulsory.

Last September the National Patent Planning Commission, headed by Dr. Charles F. Kettering, issued a report explaining its opposition to compulsory licensing in these words: "That policy and practice would not only nullify the patent owner's proprietorship, but it would also discourage inventiveness and lessen the initiative of investors by exposing them to greater uncertainty and larger risks of the investment of capital requisite to the development and commercialization of new mechanisms and compositions."

For a long time the National Association of Manufacturers, while advocating certain constructive changes in the patent system, has vigorously opposed compulsory licensing. Now a new organization joins the ranks of associations which oppose the mandatory licensing proposal. It is the National Patent Council, composed of smaller manufacturers

(OVER)

representing 28 industrial groups. NPC declares that smaller manufacturers "originate and produce • most of the patented inventions upon which industry is based" and that compulsory licensing would remove the incentive which the patent system now provides, "adversely influence research" and discourage risk capital.

Industry needs and welcomes militant recruits such as NPC. Scores of existing organizations should co-operate in the fight against reckless tinkering with the patent system. —p. 90

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EVOLUTION IN PRICING: Extension of the basing point system of pricing steel products has progressed to the point where one may be justified in wondering whether or not it will stop short of the ultimate of a base for every mill for every product.

The movement toward multiple basing points began in 1924 when the Federal Trade Commission ruled against Pittsburgh plus. In 1938 U. S. Steel, followed by other producers, set up Chicago, Birmingham and many other centers as basing points. Following a Supreme Court decision last April, producers of stainless steel abandoned Pittsburgh as the sole basing point and established numerous additional points. Now Carnegie-Illinois Steel Corp. has set up new basing points for certain products.

These changes, coupled with others which are expected to be announced later, constitute a significant evolution in steel pricing which will be important to steel consumers in postwar competition.

-p. 80

GRATITUDE, INDEED! Thursday morning newspapers carried stories to the effect that Secretary of Labor Schwellenbach was "grateful" for the action of John L. Lewis in calling off the coal strike,

This expression of gratification is understandable, but the American public will wonder whether Mr. Lewis deserves any credit for ending the strike, allegedly "in the public interest." Also subject to misgivings is the Lewis statement that "future efforts to abate this controversy (recognition of supervisors) will be resumed at a later, more appropriate date."

The cold facts are that Mr. Lewis tried to pull a fast one and failed. He violated a contract which does not expire for six months. He caused 200,000 miners to lose pay needlessly. He deprived the nation and the world of millions of tons of urgently needed fuel. He delayed reconversion by causing the production of more than 500,000 tons of steel to be lost.

Some word other than "grateful" would seem to fit the arrogant ways of Mr. Lewis. —p. 77

motordom is agog over the tip (p. 94) that Ford Motor soon will spring a plan of worker compensation which will constitute a radically new approach to labor-management relationships. . . . Civicminded Los Angeles hails with delight the estimate that 400,000 automobiles will be assembled in the area in 1946 (p. 99), compared with a prewar peak of 154,000 a year. . . U. S. Steel announces extensive modernization programs (p. 105) for National Tube Co. at Lorain, O., and American Bridge Co. at Gary, Ind. . . . Sintered carbide blanking and forming dies that multiply by 10 to 1000 the number of pieces produced per grind (p. 111) now are in production. . . . Valedictory dinner of the Automotive Council for War Production brought together, possibly for the last time (p. 93), the most impressive assemblage of eminent military and industrial personages ever to sit around a banquet table. Highlight of the affair was General Motor's C. E. Wilson's plea for a realistic wage-price policy during the reconversion period. . . . Last Monday the members of thousands of draft boards throughout the nation completed five years of service. They served without pay and their's was a thankless job. In some sections from 25 to 30 per cent of the members of draft boards and appeals boards were industrialists. Many of them gave much time to other wartime activities, often without recognition of any kind. These public-spirited men deserve a lot of credit for a difficult job well done. . . . Representatives of 13 nations, meeting in New York, drafted a constitution for a new international standards organization (p. 91), the International Standards Coordinating Association. Next meeting of the new body is scheduled for London between April 15 and May 15, 1946. . . . International Harvester Co. sees great opportunities in mechanizing small family-size farms. At an exhibition of new agricultural implements at its experimental farm at Hinsdale, Ill. last Monday (p. 84) it demonstrated a new small tractor weighing only 1050 pounds, with a full line of implements for farms of 40 acres or less. . . . The need for conserving tools and tool steels is as important in peace as it was in war. The metallurgical engineer of a division of Bendix Aviation Corp. presents practical suggestions for insuring longer tool life (p. 112) which constitute a valuable check list for manufacturers seeking economy and efficiency in tool use in postwar competition.

POSTWAR POSTSCRIPTS:

Detroit's

E.L. An

EDITOR-IN-CHIEF

cylinders are formed t diameter by $14\frac{1}{2}$ "

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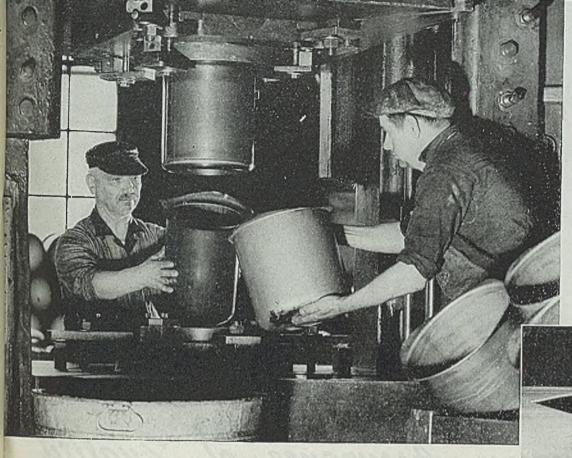
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Meetings between representatives of the United States Steel Corp. and the United Steelworkers of America to discuss the union's demand for a \$2 a day wage increase will be resumed Tuesday, Oct. 23. Shown at the beginning of negotiations, left to right: Philip Murray, USA president; John A. Stephens, vice president, U. S. Steel; David J. McDonald, secretary-treasurer, USA; and Van A. Bittner, Murray's assistant. NEA photo

Labor Disputes Issues Unresolved, Despite Easing in Strikes

WHILE the decision of John L. Lewis to call off the stoppage in soft coal mining has eased the reconversion strike picture temporarily, the nation apparently is no nearer a solution of its labor problems than it was when the war ended.

Half a dozen major strikes and scores of lesser interruptions have occurred. Reconversion has been delayed. Production of large quantities of vitally needed civilian goods has been lost. Huns dreds of thousands of workets have forfeited millions of dollars in wages.

But the country still has no reconversion labor policy and no effective machinery to prevent work stoppages.

This was the consensus of industrial observers as the coal walkout, latest in a series of crippling strikes, ended today. The coal strike was expensive. Production of the fuel, already 7 per cent behind 1944 output when the walkout started, was lost at a rate of more than a million tons daily in the later days of the strike. More than 200,000 miners were idle for periods running up to a Lack of firm wages and prices policy and absence of effective machinery to prevent interruptions to production presages continuance of labor difficulties. Coal miners return, but effects of fuel shortage to linger on

month. Coal stocks of industrial consumers dwindled to a point where it will be difficult, if not impossible, to rebuild them to a safe level this fall. The effects in some industries will be felt for weeks and perhaps months to come.

More than a half million tons of steel already have been lost. Another ten days to two weeks will be required to get coal flowing to many steel production centers and before operations can be increased to where they were before the strike started. The total loss in steel production probably will be well over a million tons—steel which is essential to the production of new automobiles, washing machines, refrigerators and other goods for which consumers are waiting and on the production of which labor must depend for employment.

Steel operations for last week dropped to 65 per cent of capacity, or about 1,200,000 tons against the industry's capacity to produce 1,831,636 tons. Producers were forced to inform their customers that previous promises on deliveries could not be fulfilled. Many of the consuming plants had to suspend or curtail manufacturing operations due to inability to obtain materials.

When news of the calls for mining resumption was received, most steel producers withdrew plans to effect further reductions in operations which would have cut the national operating rate to about 55 per cent of capacity. For the time being they are continuing at the

LABOR

reduced rate of operations, around 65 per cent—awaiting arrival of coal shipments, a matter of 7 to 14 days in most steel centers. When coal stocks are bolstered, production will rise rapidly.

Pittsburgh producers, which are near the mines, expected that coal would be arriving and that ovens and furnaces could be put in shape by late this week. At week's end only 25 of the district's 54 blast furnaces were operating and many of those operating were on reduced wind. Steel ingot production was at 49 per cent of capacity.

Eastern mills expected two weeks or more would be required to jack operations up to normal. Chicago producers figured 10 days to two weeks.

Despite the losses in production and wages and the delay in getting into largescale output of civilian goods caused by the strikes of the past two months, all the underlying causes for labor's unrest and all the threats of strikes to come remained.

Strike votes will be taken this week in the automotive industry at the plants of General Motors and Chrysler.

In the steel industry, negotiations will be resumed Oct. 23 between the United Steelworkers of America and United States Steel Corp. subsidiaries over the union's demand for a \$2 a day wage increase.

Board Lacks Influence

Meanwhile, the War Labor Board, the government's wartime agency for settling disputes, made plans to liquidate by Jan. 1. It is unlikely that it can exercise any considerable influence during the interim.

This leaves only the conciliation service of the Labor Department to deal with labor disputes. Labor Secretary Schwellenbach's failure to settle the differences between the coal miners and operators has caused the prestige of the department's mediation efforts to suffer.

Presumably an attempt will be made by the administration to set up a new agency, representing the public, labor and management, to deal with disputes after the WLB is finally dissolved. How effective such an agency can be in the absence of any firm administration policy on wages and prices is questioned.

Latest approach to a wages and prices policy pronouncement from the government came last week from Reconversion Director John W. Snyder. In several speeches in the East, Mr. Snyder out-lined a "hold-the-line" policy and stated he believed employers, particularly manufacturers, could raise wages without increasing prices. The end of overtime pay at premium rates, he said, may mean a saving on the costs of production. "For instance, a man who was working 48 hours a week on the basis of \$1 an hour of basic wages, was actually receiving more than that because of the higher overtime pay. His \$1 per hour for the 48-hour week added up to \$1.08 per



War Labor Board will proceed with plans for its liquidation by Jan. 1, its members decided last week. Above WLB members are shown in conference with the President, Reconversion Director John W. Snyder and Secretary of Labor Lewis B. Schwellenbach discussing what can be done with labor disputes after the WLB quits. Left to right, seated: Frank P. Graham, public; Mr. Snyder President Truman; Secretary Schwellenbach; Lloyd K. Garrison, acting chair man of WLB. Standing: John Leonard, labor; Vincent Ahearn, industry: Edwin Witte, public; Carl Shipley, labor; Nathan P. Feinsinger, public; New Brant, labor; George Barrs, industry; Clarence Skinner, industry; Lewis Gill public; Earl Cannon, industry; and Ray McCall, labor. NEA photo

hour.

"Because overtime is gone, the worker now gets paid \$1 an hour for the 40hour work-week. But industries that have figured their costs of production on the old overtime wage rates are now saving that 8 1/3 an hour."

Mr. Snyder also said the proposed reduction of the wartime excess profits tax, which took up to 85 per cent of the wartime profits, will also assist industry to raise wages without raising prices.

Employment in Steel Plants Declines 15,000 in August

Average employment in steel plants in August dropped nearly 15,000 below the July level, reflecting in part end the war, the American Iron & S Institute reported last week.

During August, an average of 542, employees was at work in the inducompared with 557.500 in July and v 569,200 in August, 1944.

Monthly payrolls likewise dropp during August to a total of \$128,117, from \$141,006,400 in July. In Aug 1944, payrolls totaled \$143,900, Hourly earnings of wage earners August averaged 125.3 cents, compa with 126.9 cents in July and 116.9 ce in August, 1944.

Wage earners worked an average 40.4 hours a week in August, agai 43.5 hours a week in July and 47.5 ho a week in August, 1944.

August Pig Iron Output Continues Drop

Pig iron production in August totaled 4,180,766 net tons, at 74.3 per cent of capacity, compared with 4,734,118 tons, at 84.1 per cent of capacity in July, according to the American Iron & Steel Institute. In August, 1944, output was 5,160,255 tons.

² Tonnage produced in eight months year totaled 38,203,249 tons, at 85.2 cent of capacity, compared with 848,656 tons, at 90.2 per cent for corresponding period in 1944.

Other details are presented in the companying tabulation.

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a non the sensitive the party		Ferro,		Year	Per Capi
	Pig iron	Spiegel	August	to Date	
Eastern	809.637	32,532	842,169	6,923,114	70
Pittsburgh-Youngstown	1,653.228	23,314	1,676,542	15,501,048	7(
Cleveland-Detroit	405.359		405.359	3,814,005	12
Chicago	850,912		850,912	8,129,631	71
Southern	325,890	11.935	337.825	2,610,355	- 81
Western	135,740		135,740	1,225,096	
Tabal					74
Total	4,180,766	67,781	4.248.547	38,203,249	13

Magnuson Research Bill Favored

Witnesses at Senate committee hearings in general express preference tor proposed measure which would set up a board of scientists to control national program

ONLY TWO controversial points remain to be resolved in order to implement government sponsorship of a national science program. These, as revealed at furtner joint hearings of three Senate subcommutees studying various biils aimed at this objective, are whether the proposed National Science Foundation should be controlled by a board of scientists or by a one-man administrator, and whether patent rights to all discoveries resulting from research work even partially financed by the government should revert to the government.

A third point was whether sections 109 and 113 of the Criminal Code might make it difficult for the government to get able business men and scientists to accept responsibilities in the proposed science program. This is because the Criminal Code prohibits government officials from occupying at the same time any private position which might be found adverse to the interests of the government.

In general, witnesses gave their preference to S. 1285, the Magnuson bill, which would set up a board of scientists to control the program.

Testimony by Army and Navy spokesmen revealed no cleavage in views of hose organizations. Secretary of War Robert P. Patterson and Secretary of the Navy James Forrestal were interested only in having a setup under which the stake of the War and Navy departments in the government's science program would be adequate. They also thought it would be desirable that their organizations be adequately represented in the proposed National Science Foundation.

Would Not Mention Patents

Several witnesses suggested that all reference to patent rights be eliminated from the legislation creating a National Science Foundation. The Department of Commerce, Judge Patterson reminded the senators, has a commission which is conducting a thoroughgoing study of the patent system. He thought it would be desirable to wait until this commission makes its report, after which Congress would he in a better position to do an overall job on the patent law.

This view also was held by Dr. Vannevar Bush, director, Office of Scientific Research and Development. The proposed foundation, he said, wi'l be concerned with fundamental scientific research, and fundamental research rarely lends itself to patentable inventions. Patent legislation, he believed, had no place in the science bill.

"The approach of the Magnuson bill," said Dr. Bush, "is sound. That bill leaves the foundation free to work out such patent arrangements with its research contractors as the particular facts require in the public interest." Under the Kilgore-Johnson-Pepper bill, he continued, "even though the funds furnished by the government were only a minor part of the total cost of a research project, the foundation would have to insist on acquiring all the patents resulting from the research. It would deny to the government, especially in the field of research on national defense, the services of many of the most competent industrial organizations in the country."

The Kilgore-Johnson-Pepper bill, Dr. Bush said, has a proviso allowing special exceptions but this does not meet the point because it does not allow flexibility in contracting for research; the contractor must have some assurance before he enters into a binding contract.

Dr. Bush charged that the government, which so often inveighs against patent abuses by private industry, is among the greatest destroyers of patents. When the government acquires a patent it stands ready to let anyone use it on a royaltytree basis. Any company that solves the various production and marketing problems in utilizing a government-held patent loses the benefit of its efforts and investment, because as soon as it has pioneered and developed the "know-how" any other group of individuals can enter into competition. When the government acquires patent rights, therefore, nobody has any incentive to develop such patents.

We have never had enough scientists in this country, said Dr. Busn, and one of the most important objectives to be accomplished is to make it possible to train young men and women for scientific careers at government expense. The present deficit of scientists, said Dr. Bush, cannot be made up before 1955 under present conditions—hence the urgent need for federally supported scholarships and fellowships.

Dr. Bush cited several government agencies which are directed by boards rather than single administrators, and which have been eminently successful.

Questioned about possible results of research work in other countries, Dr. Bush said it probably would take another country 15 to 20 years to develop an atomic bomb.

Present, Past and Pending

ADDITIONAL WPB RESIGNATIONS ANNOUNCED

WASHINGTON—In addition to William Todd, director, WPB Steel Division, retiring from WPB Nov. 1, the following members of WPB are retiring: A. A. Archibald, assistant director for production, returning to Jones & Laughlin Steel Corp.; W. B. McCafferty, deputy assistant director, Production Division, returning to Wheeling Steel Corp.; H. W. Bryant, chief, Plant Facilities Branch, returning to Youngstown Sheet & Tube Co., and R. C. Allen, vice chairman, Mctals and Minerals Division.

WAREHOUSE STEEL PRICE SCHEDULE AMENDED

WASHINGTON—Sellers of specified iron and steel products may obtain OPA adjustment of their sales prices equal to actual carload costs to avoid losses, and re-sellers may cover specified extra costs in their prices under OPA amendment 35 to revised Price Schedule 49 effective Oct. 19.

TO PRESENT NEW STRUCTURAL SPECIFICATION

NEW YORK—Committee on Building Codes, American Iron & Steel Institute, plans to present shortly to the engineering profession a specification for design of light gage steel structural members. It includes provisions which distinguish between behavior of stiffened and unstiffened flanges and relative load carrying capacities.

PLANS BIG PRODUCTION OF ROTOTILLERS

DETROIT—Farm Equipment Division, Graham-Paige Motors Corp. plans to produce a minimum of 50,000 Rototillers during the first full year of operation at Willow Run. First machines will be ready for delivery in December.

REDUCTION IN YOUNGSTOWN COAL RATES ORDERED

WASHINGTON—Interstate Commerce Commission has ordered a reduction in maximum rates for shipment of bituminous coal in carload lots to points in the Youngstown district from Pennsylvania, Maryland and sections of West Virginia. New rates go into effect Feb. 1.

PRODUCTION OF ZINC DECLINES IN AUGUST

WASHINGTON—Production of zinc from domestic mines in August was 45,240 tons, a decrease of 2033 tons from the July output, the Bureau of Mines reports.

PRICES

Basing Point Extension Unfolding

U. S. Steel subsidiary sets up Youngstown as base on certain products. Move seen as another step toward refining steel pricing structure

THAT CERTAIN important changes in the steel basing point system of pricing are impending has moved out of the rumor stage into reality.

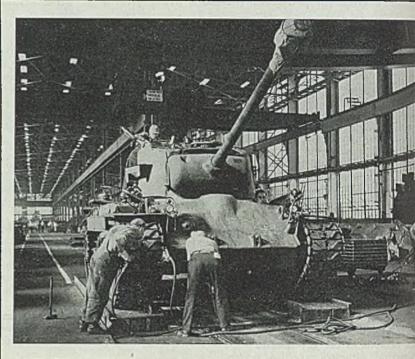
Beginning with stainless steel about a month ago, the Carnegie-Illinois Steel Corp., subsidiary of the United States Steel Corp., has moved to increase the number of price bases, last week establishing new basing points on certain carbon and alloy steel products, and on ferromanganese and spiegeleisen. Indications are further extension of multiple basing is in prospect over coming weeks.

In its latest move the Steel corporation subsidiary announced immediate establishment of Youngstown as a basing point applying to sales of hot-rolled carbon steel bars and small shapes within the range of sizes, grades and finishes it produces in the Youngstown area. It also established that city as a base applying to sales of hot-rolled alloy bars and spring steel flats, alloy bar strip and alloy strip (other than bar strip) within the sizes, grades and finishes it turns out there.

The base prices delivered f.o.b. cars Youngstown, in carload lots, was announced as follows: Hot-rolled carbon bars and small shapes, \$2.275 per 100 pounds; hot-rolled alloy bars and spring steel flats, \$2.725; alloy bar strip, \$2.725; alloy strip (other than bar strip) \$4.725. All delivered prices remain subject to applicable Office of Price Administration ceilings.

In the case of ferromanganese, Carnegie established Pittsburgh as a basing point, quoting \$140 per gross ton in carload lots delivered f.o.b. cars Pittsburgh, while on spiegeleisen it established both Pittsburgh and Chicago as bases, quoting on the 19 to 21 per cent manganese grade \$40.50 per gross ton in carload lots delivered f.o.b. cars, Pittsburgh, and \$40.60 delivered f.o.b. cars, Chicago. (Significance of the changes on ferromanganese and spiegeleisen is discussed on page 81).

Immediate reaction of other producers to the Steel corporation's move in setting up Youngstown as a base on certain steel products it produces in that area was not evident. The two major independent steel producing interests in the area stated they had the subject under consideration and would announce their



LAST OF 21,000: Lone tank stands at the end of the assembly line of Fisher Body tank arsenal at Grand Blanc, Mich., the last tank to be produced by Fisher Body where more than 21,000 were built

position shortly, but in view of the realignment of the market structure there on the products affected, it is believed the independents will have to follow the Steel corporation's policy.

Implication of the action goes beyond the simple fact of setting up Youngstown as a base since it is believed to be but one more step toward general extension of the multiple basing point system of pricing to include each product producing center as a basing point. A number of producing centers are not now so recognized. The Youngstown action is in line with rumors that have been floating around in steel circles since last spring, when the United States Supreme Court ruled in a corn products refining case that the basing point system of pricing violated certain provisions of the Robinson-Patman Act, that changes would be necessary in the steel pricing system. About a month ago these rumors were given credence by the Steel corporation's action in establishing multiple basing points on stainless steel products, which prior thereto had been based only at Pittsburgh.

Up to the present, hot-rolled bars delivered into the Youngstown area were quoted on a so-called base delivered basis of \$2.325 delivered Mahoning Valley, equivalent to 7½ cents differential over the Pittsburgh base price of \$2.25. The Mahoning Valley price covered delivery to Warren, Struthers, Youngsto Lowellville, Hubbard, Newton Fa Niles and Girard, O., as well as Sha ville and Sharon, Pa. The base delive price at these points had the si status as that at Toledo, O., east Michigan and Detroit on other steel ducts, that is the price was a more less arbitrary quotation set up for h points and could not be used as a in figuring delivered prices in surrouing areas. Outside those points nearest basing point, plus freight for such base, made the price which appli

Establishment of Youngstown as base by the Carnegie company on sizes and ranges of carbon bars a shapes it produces at that point me that consumers of hot-rolled bars small shapes now are quoted a pr slightly less than the former \$2.325 honing Valley base delivered price. hot-rolled bar sizes produced by negie at Youngstown are 3¼-inch under on rounds and 1%-inch and mo on squares.

With respect to hot-rolled allow and spring steel flats the situation somewhat different from that on car bars in that heretofore there has a no Mahoning Valley base delivered por The nearest base to Youngstown w Canton and Massillon, O. Thus the p base at Youngstown eliminates freight from those points to consume in the Youngstown area. Up to the present, alloy strip has been based at Pittsburgh, Bethlehem, Pa., Buffalo, Canton and Massillon, O., and Chicago at \$4.70 per 100 pounds. The new Youngstown base is \$4.725 including, as in the case of other products, a 21/2 cent switching charge. On alloy bar strip Carnegie produces 6-inches and under, gages under 0.250 to 0.109 inclusive, at Youngstown. For alloy hot-rolled strip the size ranges are widths up to 24-inches exclusive, and gages under 0.250 but outside the bar strip size range. Minimum gage is dependent on the alloy grade involved. As in the case of hot-rolled alloy bars the nearest base to Youngstown has been Canton and Massillon.

The range of sizes for hot-rolled alloy bars produced by Carnegie at Youn3stown is as follows: Maximum is about 1 inch on coiled alloy bar rounds; 3³/₄ inches and under on hexagons; 1³/₈ inch maximum for squares with square corners and 1 1/16 inch maximum on squares with round corners.

Carnegie produces at Youngstown a full range of spring steel flats 1 inch to 6 inches in width in gages from 0.131 to 0.500. On hot-rolled alloy bar flats the range is 6 inches and under in width, ¼-inch up to 2% inch thickness.

Steel market authorities are reluctant to discuss the changes being initiated in the basing point system pending mature study. It is generally recognized, however, that they undoubtedly foreshadow additional changes in the future. Some observers point out that in view of the new status of pricing in the Mahoning Valley on certain products it would not be surprising were a similar move taken to change the pricing setup as it now exists in certain other districts.

In the main it is believed whatever future changes are made will largely concern the setting up of basing points at producing centers now not so rated. Alse, it is said, it may mean elimination of basing points which are not actual producing points.

New Basing Points Established on Ferromanganese and Spiegeleisen

ESTABLISHMENT by the Carnegie-Illinois Steel Corp. of a basing point at Pittsburgh on ferromanganese is expected to be followed by early adjustments by other sellers of this material. This may not necessarily mean the naming of additional basing points, but will certainly lead to certain changes in delivered prices, although probably minor in general.

However, the recent action is regard-

PRICE CONTROL

Price Administrator Chester Bowles, who recently asked the 7300 industry leaders serving on OPA advisory committees how long price controls will be needed, announced last week that out of the first 1486 replies received only 6 per cent feel all price control should end immediately, while another 6 per cent think it can be eliminated by Jan. 1, 29 per cent by July 1, 1946 and 39 per cent later, conditioned on supply and demand as well as wage stabilization

Over half of the replies tabulated state controls in some industries should be extended beyond control in their own. The industries mentioned most frequently as needing controls for a longer period are building materials and lumber, food, clothing, rent and consumer durable goods.

ed by some as the first move in a further widening of the basing point system in ferromanganese in closer conformity

Steel Strapping Industry Expects Higher Peacetime Production Level Than Prewar

STEEL strapping industry, flat and round, is moving toward a level which promises to be somewhat higher than prewar after the nosedive resulting from military cancellations to which inflated estimates and allocations contributed.

Military specifications have given strapping impetus for heavy packaging and reached peak in second quarter this year: substantial part of third and fourth quarter estimates were cutback. Third quarter allocation was 129,500 tons of carbor. steel, an inflated estimate which in any event would not have gone entirely into strapping; tools, accessories and fittings were included for 25 plants of which six produce the major part of the tonnage. Allowing for some increase in normal peacetime use of strapping, the war brought considerable over-expansion. Box strapping is the bread and butter in flat, averaging $\frac{1}{2}$ in. x .020 in. Swollen tonnage resulted from heavier overseas packages and heavier strapping, notably 1¹/4 in. x 0.035 in. and 2 in. x 0.050 in. plain hotrol ed strip.

Box strapping production is highly specialized as to slitting edging and coating. Distributors of round strapping buy wire from wire mills. Higher drawing speeds and tensile strength have been developed. with the Robinson-Patman Act. Thus eventually additional basing points may be named.

The new Pittsburgh base price is \$140 per gross ton, f.o.b. cars Pittsburgh on standard ferromanganese 78-82 per cent. This price is fairly comparable to the previous delivered Pittsburgh price, which amounted to \$140.33 (based on a freight rate from Baltimore) plus 3 per cent tax on freight of 16 cents, which brought the total up to \$140.49.

Meanwhile, the base price at Baltimore, Philadelphia, New York, Rockdale and Rockwood, Tenn., and Birmingham, Ala., is \$135, f.o.b. cars. Production points at which there are no basing points at present include Sheriden, Pa., Reusens, Va., Johnstown, Pa., Pueblo, Colo., and Alloy, W. Va. The producer at the latter point also makes ferromanganese at Welland, Ont., and in normal times in Norway as well. During the war the producer's furnace in Norway was taken over by Germany. The Pueblo producer, incidentally, gets most of its manganese from Montana, New Mexico, and Utah.

Tennessee Products Corp., Nashville, which for the past few years has been selling ferromanganese on an f.o.b. furnace basis, says it proposes to continue selling on that basis.

For many years basing points on ferromanganese were confined to Atlantic seaboard ports, because of the tonnage brought in from abroad. At one time a long while ago all of the ferromanganese used in this country was imported. Later, however, American production increased to a point where it was in a position to meet the great proportion of the needs in this country. Nevertheless, certain seaboard ports continued as basing points as foreign competition had to be met.

Two new basing points have been set up on spiegeleisen, Carnegie-Illinois Steel Corp. having announced as immediately effective a price of \$40.50 per gross ton on carload lots, delivered f.o.b. cars Pittsburgh, Pa., and \$40.60, same basis, Chicago, and with all delivered prices remaining subject to the applicable Office of Price Administration price ceiling, as was also the case in setting up the new basing point on ferromanganese.

Until recently the only basing point on spiegeleisen has been Palmerton, Pa., where the price on 19-21 per cent material was and continues to be \$36. On the basis of a \$4.80 freight rate from Palmerton to Pittsburgh, the new Pittsburgh base would appear to represent an advantage for Pittsburgh consumers of 30 cents, and on the basis of a \$6.80 freight rate from Palmerton to Chicago, the new base at that point would provide an advantage for local consumers of \$2.20.

Earning Prospects To Be Yardsti

Government offering 29 steel plants which cost more than \$700 million to build. Finds "limited interest" in Geneva. Symington, in report to Congress, outlines factors in disposing of facilities B0

PRIMARY yardstick in determining prices for government-owned surplus steel plants will be the prospective earning capacity of the facilities, the Surplus Property Administration has announced in a report to Congress on the disposal of these plants. However, the unusual risk involved in new steel producing areas and factors affecting the general economy also will be considerations.

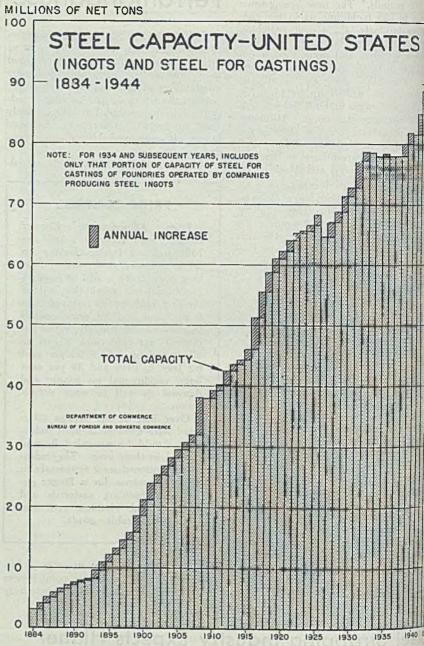
Original cost will not be a basic yardstick, although replacement costs may be used to set maximum prices.

Disposal of each government-owned plant will be considered separately and some of the plants will be leased if special problems make this more desirable than outright sale.

The report on surplus steel plants, submitted by W. Stuart Symington, surplus property administrator, concerns the pricing and other problems involved in the disposition of 29 iron and steel plants which cost the government more than \$700 million. More than \$1.3 billion of government funds went into the wartime steel expansion program, but the SPA report deals only with those projects costing more than \$5 million. These larger plants are technically capable of independent operation while much of the remaining government investment is in "scrambled" facilities so tied in with the plants of private owners that they are incapable of separate operation.

Of the government's 20 plants costing more than \$5 million each, 25 are Defense Plant Corp. plants and four are owned by the Army and Navy. All but two—the Geneva Steel Co. plant in Utah and the Andrews electric furnace plant in Kentucky — are encumbered by purchase options.

Because of the special problems involved in the disposal of the \$200 million Geneva steel plant, this facility is given special treatment in the report and a whole section is devoted to it. The plant is not only the largest single disposable plant owned by the government, but it is considered the key to the industrial growth of the West. Unlike most government-owned plants, Geneva is free of contractual provisions restricting its disposal, no part of it is



privately owned and no option on it is held.

Mr. Symington reported that the Reconstruction F in a n c e Corp., disposal agency for the plants, already has asked 30 of the larger integrated steel companies if they were interested in the facilities. All but two have replied and of these only three have indicated any interest in acquiring the plant.

The United States Steel Corp., which built and operated the plant for the government without charge or fee, told the disposal agency early this year it was interested in acquiring the plant through purchase or lease. In August, the corporation withdrew its offer and at the same time announced plans for expanding facilities of its West Coast subsidiary, Columbia Steel Co. In announing its withdrawal from the Geneva pture, U. S. Steel officials stated they a lieved statements by former Attom General Biddle and by members of the Surplus Property Board had in eleruled out the corporation as a prosperir lessee or purchaser of the property.

Colorado Fuel & Iron Corp., Dear proposed to lease the plant provided by government would spend \$73 million for supplemental facilities.

The Kaiser Syndicate in July proper to lease the plant and make certain modifications at its own expense. N subsequent proposal for the operation Geneva has been received from the Kaiser interests.

"It would appear," says the rep-

In Fixing Prices for Facilities

"from the limited interest which has been developed in securing prospective purchasers or lessees for the Geneva plant that there are either limited possibilities for the postwar competitive operation of Geneva or that there is apprehension concerning the possibility of reasonable valuation and financing arrangements."

Advantages of Geneva, as well as the limiting factors, are well recognized by the companies which are potential bidders for the plant. Principal advantages are:

A substantial market in the West which is relatively heavily weighted with such profitable steel items as tin plate, pipe, and tubes.

A market in which prices have reflected transportation charges from eastem producing points.

Accessible raw materials bearing relatively low assembly costs.

A modern, well-designed, efficient producing plant.

Market expansion prospects reflected by a rapid population growth and a high industrial expansion rate in the West.

Limiting Factors

Limiting factors include:

Skepticism concerning the long-run adequacy of the ore reserves.

Ability to economically coke Utah coal in the Geneva blast furnaces has not been evidenced by limited operating experience.

Development of sufficient market outlets to justify continuous operation involves considerable risk.

Uncertainty of commercial freight rates to principal coastal consuming points which are competitive with the cost of water transportation from eastern scaboard plants; and

Possibility of capital costs which will be out of line with competitors because of the cost of reproduction of equivalent facilities, and the large investment in new facilities required.

Discussing the economic problems that will be created by disposal of the iron and steel plants, the report points out that the nature and size of postwar markets for steel products will largely determine the extent of their peacetime use. Since steel production expands in periods of brisk economic activities and contracts with recessions, the future use of these plants is closely tied with the effective functioning of the economy.

Experience with low-level operation of the steel industry in the decade before the war provides a basis for concern over the extent of the use of the government-owned plants, the report adds. However, it is suggested some surplus equipment might be used to Geographic changes in steel production also are discussed in the report. The most noticeable change in the pattern of the industry due to wartime expansion is the increase in the relative prominence of the West and Southwest as steel producing areas, even though, in its relationship to total capacity in the country, the steel industry in those areas is not large. Some 20 per cent of all wartime expenditure for new steel facilities was in the area west of the Rocky mountains.

The change in the relative position of the major steel producing companies brought about by war expansion has been minor, the report states. The capacity of virtually all companies has increased. About half of all the money spent for increasing the country's steel-producing facilities has been financed by industry. Of total of \$2,584,944,018 spent on the steel expansion program, \$1,273,201,-366 was privately financed and \$1,311,-742,652 was government financed.

New construction by industry and by the government has increased the country's total steel ingot capacity by more than 15 million net tons per year and approximately the same expansion has taken place in the capacity for production of pig iron. Slightly less, or 13,400,-000 net tons, has been added to the country's coke oven capacity, 77 per cent of which is in modern by-product plants. The capacity of sintering plants has been increased by 11,500,000 tons. Wartime capacity expansion of the industry has been nearly 17 per cent.

With reference to that objective of the Surplus Property Act which grants certain preferences to small business, the report notes the administration's ability to so control disposal of these plants as to facilitate the interest of small business is limited because the achievement of economies in the production of steel are closely associated with large-scale integrated production.

SPA, however, recognizes that small business can operate, and should be encouraged to operate, a number of the government plants costing less than \$5 million many of which are auxiliary to the iron and steel industry, including units in the casting and forging field, as well as plants for the fabrication of steel products.

In discussing the pricing problem, the report said that in addition to bid price, consideration will be given to the following other factors:

1. The diversity and magnitude of the proposed production program consistent with economic operation.

2. The proposed pricing policy of the bidder. (The disposal agency will consider the prospects of lower steel prices to steel users as a primary test of effective independent competition under the act).

3. Relative competitive position of the bidder in relation to the market to be served by the plant.

Senators Not Opposed to Sale of Surplus Government Aluminum Plants to Alcoa

SENATORS attending the joint hearings of three Senate subcommittees concerned with disposal of governmentowned alumisum plants indicated last week that they probably would not oppose disposition of such facilities to the Aluminum Co. of America if a move of that kind is recommended. It was brought out in answers to questions, particularly those by Senator Wherry, of Nebraska, that Alcoa has resources, know-how and research facilities which should enable it to operate these plants acceptably in the public interest with reference to such factors as price of product, getting out production and providing employment.

I. W. Wilson, vice president of Alcoa, admitted under questioning that his company would like to acquire some of the plants even though it had not made proposals to the RFC. W. Stuart Symington, surplus property administrator, said that even though seven companies had made offers to RFC to buy or lease aluminum plants, all wanted some sort of government guarantee against operating losses.

Assistant Attorney General Wendell W. Berge recommended the government make it clear that competition will be established in the aluminum industry "no matter what it takes."

Several senators voiced firm opposition to subsidizing any company to operate these plants and there was little interest in the monopolistic angle in disposal plans. Sen. Josiah W. Bailey (D., N. C.) in fact lately introduced a bill in the Senate prohibiting sales or leases featured by subsidy arrangements. Mr. Berge reminded these senators that the federal court in its ruling on Alcoa decided not to order any dissolution of Alcoa at the time, but will wait until it learns how Alcoa's position in the industry is affecting the disposition of government-owned plants.

More Power Equipment For Farms

International Harvester displays production and experimental postwar farm machines at preview. Shows advances in agricultural technology

WHAT the farmer will have available in postwar farm machines was revealed by International Harvester Co., Chicago, in a comprehensive display and demonstration Oct. 15 at the company's experimental farm in Hinsdale, Ill.

The line included both production and experimental machines. Purpose of the demonstration was not to exhibit final accomplishment, but to exhibit what is being done to enable the farmer to produce more at less cost and also to demonstrate that progress of the farm machinery industry is abreast of the general advance in science and technology.

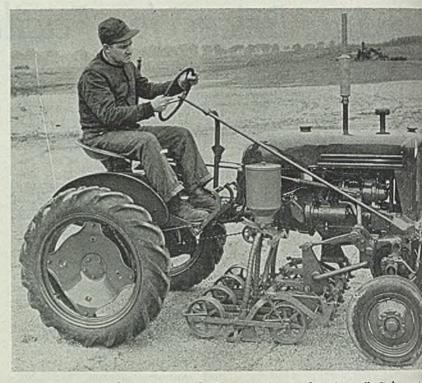
The preview of farm equipment was convincing evidence that agriculture will continue its prewar trend toward greater mechanization, and that as a consequence demand for steel and metals, and machinery for fabricating and processing them, will continue to expand.

Outstanding among the experimental machines is the Farmall Cub, a new small tractor weighing 1050 pounds and having 10 horsepower, developed with a full line of implements for farms of 40 acres or less.

This new, smallest farm tractor will be produced as soon as manufacturing facilities can be put into operation in a new \$47 million plant at Wood River, Ill. Expectation is that with a full complement of implements it will cost no more than a good team of horses and horse-drawn implements. Weight and power of the Farmall Cub are about two thirds those of the company's present smallest tractor.

Pulling a single 12-inch stubble-bottom plow, it is capable of plowing 2½ to 3 acres per 10 hours in most soils, and under normal conditions will cultivate 1 acre of corn or a like area of other row crops per hour. Fuel consumption of its 4-cylinder, 4-cycle engine under maximum load is said to be less than 1 gallon of gasoline per hour.

Implements to be provided include: Moldboard plow, two-way plow, disk plow, disk harrow, combination wagon



Just announced by International Harvester Co. is this Farmall Cub track intended to offer the small-acreage farmer the advantages of complete, low cost mechanization. It weighs 1050 pounds and provides 10 horsepower. full complement of quicklu-attachable implements is available. As shown her it is equipped with a vegetable planter

and spreader, mower, corn planter, corn cultivator, blackland planter, combination planter, vegetable planter, vegetable cultivator, and harrow plow. Others are under uevelopment. All tools are designed for quick and easy attachability.

International Harvester also announced a new "touch control" power actuating system, which substitutes power of the tractor engine for human effort in control of farm implements.

This power actuating unit is built into the tractor as an integral part. The unit controls implements mounted by a device called the "frame-all," a universal mounting frame which permits various types of cultivating and planting equipment to be attached and detached easily.

Other farm machinery displayed but still regarded as in experimental development included a new smaller and lighter corn picker, cut-off corn picker, sugar beet harvester, a new side-delivery rake, highway mower, dry hay chopper, green hay chopper, new small hay baler, power loader, and new smaller self-propelled combine.

By the end of next year, Harvester expects to be in production on two types of farm home freezers.

Demonstrations were made of the mechanical cotton picker and one-man pickup hay baler, both of which are now production machines. Also displayed were a self-propelled combine and a spreader for liquid manure.

Addressing their guests, Fowler Mc-

Cormick, president, J. L. McCaffrey, vice president, and other Internat Harvester executives, expressed the pany's convictions concerning deve ment of American agriculture during postwar period as follows:

1. That the inevitable advances in technology will demand an increasing greater variety of specialized tractors attachments rather than a single farm tor with a single system of tools.

2. That farm machinery must do a complete job than ever before in enal farmers of all classes in all areas to duce more food with less effort and sequently, at lower cost.

3. That the millions of small fan size farms offer an opportunity to manufacturer of farm power and chinery to serve these small farms wi degree of economy and efficiency of parable with that now available to larger farm operators.

4. That farm machinery must be signed with an eye to those improves management practices essential to serve and increase the farmer's most portant capital asset—soil fertility.

Mr. McCormick confirmed reports the last few days that International if vester has been discussing with RFC several weeks the possibility of purding the \$71 million plant in Melrose F Ill, which Buick Aviation Division, G eral Motors Corp., built and operated manufacture airplane engines during war.

Wire Convention Well Attended; Award Medals

A. R. Zapp honored at Chicago meeting for research in tungsten carbide. Fourteen papers presented

A. R. ZAPP, carbide products managei, Firth-Sterling Steel Co. Inc., McKeesport, Pa., was awarded the Wire Association medal for 1944 for his research in tungsten carbide at the annual meeting of the Wire Association, held at the LaSalle hotel, Chicago, Oct. 15-18.

Honorable mention was awarded F. S. Stickney, vice president and chief engineer, Instrument Specialties Co., Little Falls, N. J., for his paper on nonferrous wire.

Last week's meeting marked up a registration of 325, surpassing that of the Pittsburgh meeting a year ago. Toronto, Ont., has been chosen for the 1946 annual convention of the association starting Oct. 16.

Up until Sept. 1 grave doubt existed as to whether this year's annual meeting of the association could be held but with the lifting of restrictions on travel, arrangements for last week's meeting were made. This meeting will go down as one of the best annual gatherings even held by the Wire Association. The seven technical sessions with 14 papers on ferrous and nonferrous wire manufacture fostered interest from the opening to the closing paper and stimulated prolonged discussion, both written and oral.

At a luncheon Wednesday, L. S. Hamaker, assistant general manager of sales, Republic Steel Corp., Cleveland, spoke on "An Appraisal of the General Business Outlook."

If excess electric furnace capacity is left out of co..sideration, the steel industry faces capacity operations for at least three years and perhaps longer, Mr. Hamaker said.

Studies indicate all major steel consuming markets are still there and, for a few years at least, many of them apparently will need more steel than we are able to give, said Mr. Hamaker, pointing out there is no evidence any important steel market has been seriously invaded by competing materials.

The auto industry estimates if it operates at a 5-million car annual rate, it will take until 1950 to catch up. All experts agree, the speaker asserted, a tremendous housing shortage exists in this country and this market is estimated at one million homes a year for at least 10 years.

The farmer, Mr. Hamaker related, will be a large buyer of many things made of steel. Railroads will require great tonnages for deferred maintenance alone. The average major roads will replace 10 per cent of its main line rail each year.

The speaker asserted he did not expect the airplane industry to operate above 5 per ce., t of its wartime capacity. A nauonal trunk highway system is in the final planning stage, he said, and large tonnages of steel will be required for construction of it.

In dealing with light metals and plastics and their probable effect on the steel industry the speaker mentioned that peak production of aluminum was $1\frac{1}{2}$ million tons and 90 per cent of it went into the airc: ft industry. Whether peacetime applications can be found for this tonnage of a material is highly questionable.

Optimistic views on the export market for steel were expressed by the speaker.

Steel Construction Group To Meet at French Lick

The American Institute of Steel Construction will discuss immediate postwar problems at the institute's convention to be held at French Lick Springs Hotel, French Lick, Ind., Oct. 29, 30, 31 and Nov. 1.

Prominent on the list of speakers will be Paul Coddington, president of the institute; ex-Congressman Samuel B. Pettengill; Albert E. Meder, labor relations expert of Detroit; O. Kline Fulmer, architcct and city planner who helped prepare the "Toledo Plan"; E. L. Shaner, president, Penton Publishing Co. and editor-in-chief of STEEL, and Dr. William Dern, humorist.

MEETINGS ...

Oct. 23-24, Gray Iron Founders' Society: Annual meeting, Chicago. W. W. Rose, 1010 Public Square Bldg., Cleveland, executive vice president.

Oct. 24, Porcelain Enamel Institute: Annual meeting, William Penn Hotel, Pittsburgh.

Oct. 24-25, Machinery Dealers National Association: Annual convention. Congress Hotel, Chicago. R. K. Vinson, 20 North Watker Drive, Chicago, is executive director.

Oct. 29-Nov. 1, American Institute of Steel Construction: Annual meeting, French Lick Springs Hotel, French Lick, Ind. Robert F. Brooks, 101 Park Ave., New York 17, is executive vice president.

Nov. 1, Associated Industries of Alabama: Annual meeting, Tutwiler Hotel, Birmingham.

Nov. 2-3, American Institute of Mining & Metallurgical Engineers: Annual meeting of the Ohio section Open-Hearth Committee and Ohio Valley Section, Deshler-Wallick Hotel, Columbus, O.

Nov. 9, Blast Furnace & Coke Oven Association, Chicago District and Eastern States Blast Furnace & Coke Oven Association: Hotel Carter, Cleveland.

TRANSITION TOPICS

LABOR— Issues underlying recent labor disputes continue unresolved. Firm policy on wages and prices lacking. War Labor Board disbanding, leaving no effective machinery for preventing work stoppages. See page 77.

SURPLUS STEEL PLANTS—Prospective earnings will be vardstick for fixing prices on 29 iron and steel plants which cost government more than \$700 million. Only one firm hid received for Geneva plant: See page 82.

FARM IMPLEMENTS— J endi g manufacturer previews what farmers may expect in postwar power equipment See page 84.

STANDARDIZATION—Progress being made in establishing uniform standards. International co-ordinating group formed. Engineering specifications reviewed at Ottawa conference. See pages 86, 91.

PATENTS—Counter offensive against critics of patent system launched by smaller manufacturers through National Patent Council. National Association of Manufacturers opposes compulsory licensing bills. See page 90.

STANDARDIZED HANDLING—Attaining the ultimate in efficient materials handling systems during the war, most cost-conscious manufacturers will not be satisfied with anything less than complete mechanization of those facilities. See page 106.

COLD STRIP MILL—Ten units of radical Sendzimir cold strip mill will be in operation soon. Caster backing principle, intriguing to steel producers, permits use of small work rolls even for 50-in. wide strip. See page 124.

Product Standardization Program Moves Rapidly Toward Realization

By spring of next year interested parties hope machinery will have been provided on the scale necessary to care for the nation's expanded postwar requirements. Program aimed at facilitating production and broadening markets

FOLLOWING a number of delays due to the necessity of studying factors involved, progress is being made more rapidly toward setting up facilities for big expansion in the work of establishing standards for manufactured products. The goal, as visualized by sponsors of the movement, is ultimate standardization of virtually all products.

of virtually all products. The object is twofold. One is to smooth the path of manufacturers by permitting them to benefit from mass production and distribution, better control of product quality, broadening of sources of supply, broadening of markets, and lessening of customer complaints. The other is to provide more adequate safeguards to buyers, who will be able to buy more intelligently and who will be able to judge whether the goods, upon delivery, conform to the standards under which they bought.

The overall objective, of course, is to serve the public, so that it will be able to buy goods of desired or adequate quality, at reasonable prices, and at the nearest store.

The present program got under way in 1943 when the secretary of commerce launched a study on the general subject of "Standards in Commerce." The result was a very interesting report by Carroll L. Wilson, one of the secretary's consultants, who reached the conclusion that "if standards are to be extended to the ultimate consumer, a far more effective performance will be essential."

At the time Mr. Wilson submitted his original report-in December of 1943businessmen of the country were in a dither over Office of Price Administration proposals to make use of government grade-labeling as a means of price control. At that time there were two schools of thought. One wanted standards to be set compulsorily by the National Bureau of Standards. The other was dead set against any application of compulsion and wanted standards to be set voluntarily as a result of discussions between merchants, manufacturers, representatives of the public and representatives of other interested groups. The second group, specifically, wanted the whole program entrusted to the American Standards Association, and a move was under way at the time to ask Congress to grant a charter to the ASA for this purpose so that there could be no future misunderstanding.

Although this argument was termi-

nated in 1944, when Congress banned government grade-labeling, it is of interest to note that Carroll L. Wilson's report—which since has been the basis of the continuing study of the Department of Commerce—advocated voluntary rather than compulsory setting of standards.

"On the ground that the great majority of standards in prospect involve no questions of health, personal safety or protection of property," Mr. Wilson found, "there is no predominant need for compulsory standards, and the public should look primarily to business rather than government to evolve the performance data it will want. Likewise, standards development should follow the voluntary agreement process as its main channel."

Mr. Wilson reported that "there is a strong case for a single private body to serve as a focal point of leadership in standards development for both industrial and consumer goods," and "to provide effective leadership, such a standards agency would itself have to meet certain minimum requirements; it would have to be completely above suspicion of undue financial control by special interests; its top management should reflect equitably the points of view of producers, merchants, and consumers." He called for the "complete rebuilding of the American Standards Association into a new, exclusively private standards body, capable of dealing effectively with both industrial and consumer goods."

Urges Strengthening of Bureau

As to the National Bureau of Standards, Mr. Wilson found that the bureau had achieved "unique stature in the basic arts of measurement" but that in the application of standards to commerce its actual achievements had fallen "far short of opportunities." A far more effective performance would be required in the future, he found, and he recommended that the bureau be strengthened.

The secretary of commerce submitted this report, early in 1945, to a "Conference on Standardization" attended by 50 representatives of industry and business. In the main the conference approved Carroll L. Wilson's findings but recommended appointment of a smaller "Policy Committee" to conduct a thorough investigation. Such a committee was appointed by Undersecretary Wayne C. Taylor as follows:

Chairman, Charles E. Wilson, presi-



CHARLES E. WILSON

dent, General Electric Co.; Frederick M Feiker, dean of engineering, Georg Washington University; Clarence Franc chairman of the board, General Foor Co.; Ephraim Freeman, R. H. Macy Co. Inc.; Frank B. Jewett, president, M tional Academy of Science; William H Warner, president, McCall Corp.; Artho D. Whiteside, president, Dun & Brad street Inc.; R. E. Zimmerman, vice president, United States Steel Corp.

dent, United States Steel Corp. Under date of June 6, 1945, the Poicy Committee reported its belief the standards would be of ever-increasing im portance, that they would ultimately a fect the production and sale of all good and that therefore, provision must be made for the orderly development of a standards.

This work, the committee found, "" need to be co-ordinated and promoted through a disinterested private ageno organized to function in the broad pub lic interest. It appears that this function can most logically be fulfilled by the American Standards Association. The committee believes that the scope of the American Standards Association should be so broadened that it can handle and standards or standardization project which deserves national recognition whether for raw materials, intermediate goods, production goods; consumer goods or for safety, or for engineering or for commercial transactions; that the associ tion must make sure it includes in it activities all groups entitled to a voic in the adoption of standards as well a those competent to advise on consume reactions, and that the American Stans ards Association maintain itself as a tra independent association, privately nanced, accomplishing its standards clear ance and standards promotion voluntar ily, with full participation of all interest including those of the consumer.

"The committee takes in good faith the assurances of the management of the American Standards Association that it will prepare itself to serve as the not tion's standards clearing house."

On the other hand, the committee

recommended, the National Bureau of Standards "should freely lend its assistance to all responsible citizens and groups engaged in standards development," and that the bureau "plan for a continuation of research in the field of standards, and for the future development of needed new testing methods and that this be properly financed through federal funds; the bureau's facilities should be extended when and as necessary so that the bureau may most effectively aid standardization projects."

The committee further recommended that under such a conception the Divisions of Simplified Practice and Trade Standards no longer should belong in the Bureau of Standards but should be transferred to a more suitable status elsewhere in the Department of Commerce. "The work of these groups should continue, but on the levels of research and technical consultation."

Standards play a rapidly increasing role in private business transactions," reported Charles E. Wilson in his capacity as chairman of the Policy Committee. World War II, like World War I, has given a great impetus to standardization. There are unmistakable signs that simlar acceleration and intensification is now occurring and that it is likely to continue at an even greater pace during the period of reconversion and readjustment and thereafter.

New Standards Needed

"The many changes that have been caused by conversion of industry to war production and that will be caused by reconversion to peacetime production have created a need for many new standards and for changes in existing standards to fit them to new conditions --if parts are to fit, if defects in workmaship or materials are to be avoided, if delivery dates are to be met, if misundenstandings between manufacturer and purchaser are to be eliminated and if parchasers are to be adequately assisted in selecting and obtaining without delay the proper product for particular needs."

Remon for selection of the American Standards Association to head up the work Mr. Wilson explained, is that the ASA is a federation of 21 professional and technical organizations, 55 trade associations, seven departments of the federal government and three federal agencies. Over 500 national organizations have been co-operating in its activities, and over 3000 men and women are serving on its committees.

Following submission of this report, Chales E. Wilson was asked by the Department of Commerce to pursue the matter further by discussing the whole matter with representative consumer groups. This was done in an open session held in New York on Sept. 21. The various groups, such as the American Association of University Women, the American Home Economics Association, and others, were asked to submit their proposals in writing. As soon as these written reports have been received and studied, Charles E. Wilson and his committee will submit their final report. This should be sometime in the next month or two.

After submission of this final report, final details of the picture should be moved quickly into place. The Department of Commerce will ask Congress for an additional appropriation to finance the contemplated broadened standardization program. And directors of the American Standards Association will freeze their plans for expanding the activities of the association in line with the recommendations by Mr. Wilson's committee. By the spring of next year, interested parties hope, machinery will have been provided on the necessary scale to take care of our expanded postwar standards requirements for several years to come.

Functions of Civilian Production Administration Outlined by Small

CHIEF function of the Civilian Production Administration when it takes over the remaining activities of the War Production Board on Nov. 3 will be to help industry through the transition period, J. D. Small, administrator of the new agency, said last week, pointing out that in no sense is the agency being set up as a permanent bureau.

The WPB organization will be continued though it will be considerably smaller in size. Among those who will assist Mr. Small in working out transition problems will be William L. Batt, U. S. member of the Combined Boards; Maury Maverick, chairman of the Smaller War Plants Corp.; Philip Maguire, deputy administrator; Laurence M. Lombard, general counsel; Ralph Hetzel, Office of Labor Requirements; Robert Johnson, Review and Analysis Division; Maxey Morrison, director of information; and the directors of the five operating burcaus of CPA.

The five operating bureaus, their heads, and functions are as follows:

Bureau of Reconversion Operations, Director Fred Glover, will contain all the industry divisions such as metals, and minerals, lumber and forest products, textiles, consumers' durable goods, equipment, rubber, construction, chemicals.

Bureau of Reconversion Priorities, Director Lincoln Gordon, will include the general administration of priorities, allocations, regulations, inventory, compliance and such other controls as are required during the transition period. The Bureau will include a Government Division, where local, state and other governmental agencies can come for specialized help. The Canadian Division will also be in this bureau. One division will deal with the simplification and, as soon as conditions permit, the revocation of, individual regulations and controls. One of the important phases of the work of the bureau will be the granting of AAA priorities and directions to break bottlenecks in reconversion.

Bureau of International Supply, Director Robert Turner, will be charged not only with protecting the economy against undue drains by export but also with seeing to it that export obligations to other countries are fulfilled. This bureau will also manage those controls on imports which are retained, and will contain, temporarily at least, the Combined Boards.

Bureau of Field Operations, Director Clarence A. Woodruff, will control remaining operations in the field and regional offices.

Bureau of Demobilization, Director G. Lyle Belsley, will take over those functions that are going to be demobilized or transferred. This bureau will also handle CPA personnel records and contacts with the Bureau of the Budget.

Explaining the job which CPA has ahead of it, Mr. Small said, "The Civilian Production Administration has been charged with the duty of furthering a swift, orderly transition from wartime industrial production to a maximum peacetime production. free from wartime controls, with due regard for the stabilization of prices and costs. The six main functions of the CPA will be to:

1. Use the authorized powers of the Civilian Production Administration to expand production of materials which are in short supply.

2. Limit the use of scarce materials. 3. Restrict the accumulation of inventories so as to avoid speculation, hoarding, and unbalanced distribution which would curtail total production.

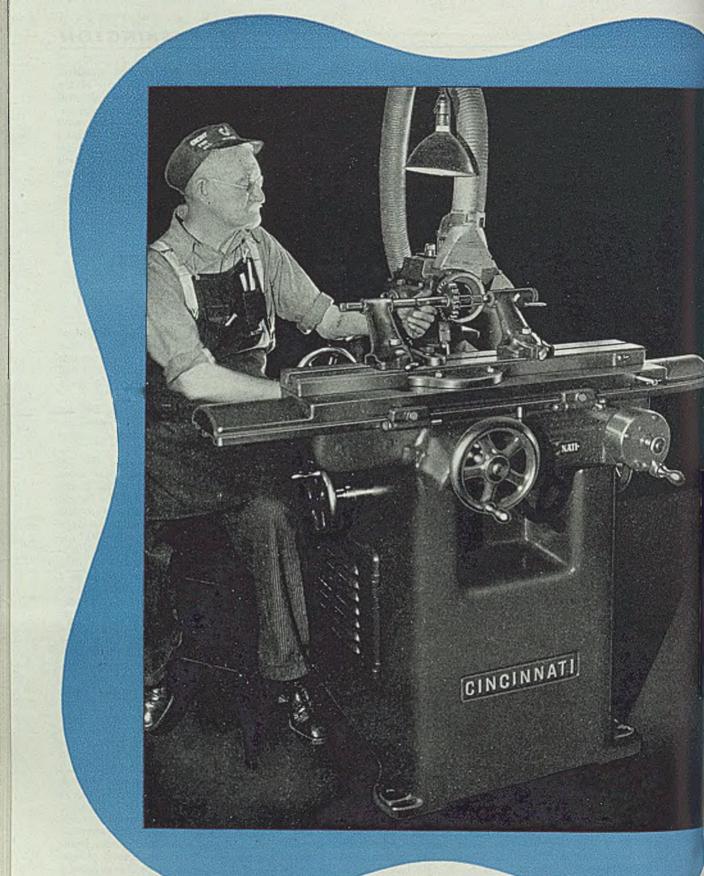
4. Grant priorities assistance to break bottlenecks which threaten to impede the reconversion process:

5. Facilitate the fulfillment of relief and other essential export programs.

6. Allocate scarce materials or facilities necessary for the production of lowpriced items essential to the continued success of the stabilization program.

Domestic Output of Lead Drops Slightly in August

Lead production, in terms of recoverable metal, from domestic mines in August was 30,009 tons, a decrease of 278 tons from July, preliminary estimates of the U. S. Bureau of Mines indicate.



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Left: CINCINNATI'S effortless table traverse is an important consideration to this operator, who, at the moment, is grinding the secondary clearance on a straight tooth side milling cutter. Catalog M-962-3 contains complete specifications for the No. 2 Cutter and Tool Grinder. A brief description may be found in Sweet's Catalog File for Mechanical Industries.

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89

Industry Defends Patent System; Compulsory Licensing Opposed

Smaller manufacturers organize new council to launch counteroffensive against critics of system. Headquarters established in Gary, Ind. National Association of Manufacturers outlines program for constructive revisions in system

DEFENSE of the United States patent system and resistance to proposals which would impair or destroy that system were voiced last week by two groups of manufacturers.

In Gary, Ind., the National Patent Council, a new organization of smaller manufacturers, announced plans for a counteroffensive against attacks on the patent system. The council, headed by John W. Anderson, president of the Anderson Co., Gary, represents 28 classes of industries.

In New York, R. J. Dearborn, chairman of the committee on patents of the National As ociation of Manufacturers, warned that American supremacy in invention and technological progress will be endangered by compulsory licensing of patents as set forth in several bills now pending in Congress.

"Although the vociferous critics of the patent system profess to be saving the country from monopoly, they are in reality promoting monopoly by threatening the life of every smaller company relying upon patents," Mr. Anderson declared in announcing the formation of the National Patent Council.

"Individually, we have been shouting as loudly as we could, with little effect. Now smaller manufacturers join forces, in National Patent Council, to appeal directly to the fair-minded American people to get the misled 'reformers' off our necks so we can plan jobs and products for higher levels of good living.

"Smaller manufacturers, who employ most American factory workers," he added, "also originate and produce most of the patented inventions upon which industry is based.

"So long as Congress and the courts maintain inviolate the traditional 17year exclusive right of the inventor to his own creation, the smaller manufacturer can continue to invade successfully, with products of greater value to the public, the markets of entrenched competitors. Thus the Patent System functions as the indispensable stimulant to that competitive enterprise upon which the continued progress and security of America depends."

Council policy, Mr. Ander on said, will be determined by a board of five governors, made up exclusively of smaller manufacturers, and the governors, in turn, will be responsible to representative regional chairmen, also smaller manufacturers. Some 200 leading patent lawyers already have volunteered their services on technical patent matters as advisory associates of the council.

"This country's growth to the status of the world's greatest industrial nation has been due largely to its patent system," said Mr. Dearborn of the National Association of Manufacturers, "Compul-



JOHN C. PATTERSON

Who has been appointed executive vice president of the National Patent Council, an organization of smaller manufacturers launching a national program in defense of the patent system. Mr. Patterson has been director of patents and industrial research department of the National Association of Manufac-

turers

sory licensing of patents would strike at the very fundamentals of the system. It would compel the holder of a patent to grant licenses to others to produce his invention and would, in effect, mean a sharing of inventions, which is foreign to our American way of life.

"By forcing an inventor to give up his exclu ive rights before he has an opportunity to reap any reward the full incentive which the patent system is intended to give would be largely removed.

"Furthermore, if the patent holder is forced to license to all who may apply he will be unable to obtain risk capital for the commercialization of his invention. Investors are willing to exploit a promising invention largely because of the exclusive rights for 17 years given an inventor by the grant of a patent.

"Compulsory licensing also would adversely influence research. There would be a tendency for inventors to keep their inventions secret which would defeat the chief purpose of the pater laws-to encourage disclosure."

Special importance was attached in NAM to the third report of the Nation Patent Planning Commission, issues Sept. 6, 1945. This group, headed in Dr. Charles F. Kettering, stated its of position to compulsory licensing as for lows: "That policy and practice woun not only nullify the patent owner's prietorship, but it would also discort age inventiveness and leasen the initiate of investors by exposing them to great uncertainty and larger risks of the investment of capital requisite to the development and commercialization new mechanisms and compositions."

Compulsory licensing would be m damaging to small business and in pendent inventors as it would destr their strongest weapon of competiti and would legitimatize piracy of inve tions, Mr. Dearborn stated. Particula significant, he said, is the following the report of the National Patent Planing Commission: "In the postwar inventions will be powerful aids to sm enterprises, both as to the products a the means of manufacture. Many such lesser producers owe both th existence and their continuance to p ented mechanisms and compositions. they were obliged to license to others including their largest rivals - the t of the inventions covering their in b mentalities and their articles of man facture, their status would be enda gered and competition benefiting ! public would likewise be hazarded. Ev our greatest industries had small t ginnings and their growth is surely r a detriment to our national welfare.

Hearings Show Need for Protection

During the last 40 years more has 30 compulsory licensing bills have been introduced in Congress, NAM points out. Testimony in hearings on the bills has been overwhelming to the effect that it would be fatal to numerous small enterprises and that small business can not prosper without the protection a forded by the exclusive right granted the patent laws.

Advocates of compulsory licensing patents contend that industry suppress inventions and that, therefore, the left lation they seek is necessary."

Industry, through NAM, is back a program for constructive changes the patent system. Among the sions which NAM is advocating are. The public recording in the Patent Of of contracts relating to patents in far as the public interest is affected. It would combat illegal cartels by factating government investigation of practices in v o l v e d and enable government to determine whether the are contrary to public policy, or in will lation of antitrust laws, or in confiwith international policy; (2) limiting life of a patent to a period of not merthan 20 years after the application therefor has been filed, but keeping the term of a patent at 17 years; (3) providing the Patent Office with more adequate facilities and additional personnel so that it may employ and retain scientists of outstanding ability in suffi-

cient numbers to make a more complete examination of every patent application; (4) simplification of accounting proceedings to reduce the cost of patent litigation; and (5) reduction of the cost and simplification of the procedure of patent litigation.

Engineers Study Unification of Engineering Standards at Ottawa

GROUNDWORK for the unification of engineering standards of the United States, United Kingdom and Canada was laid during the two-week conference on standardization problems held in Ottawa recently under the auspices of the Combined Production and Resources Board.

During the course of the discussions, which included the subjects of screw threads, pipe threads, drawing practice, metrology and limits and fits, a basis of agreement was reached on many aspects of these technical problems and it is anticipated that proposals on specifications will be developed through the normal machinery which exists in the various countries for such action.

The conference brought together many notable engineers from the three countries and focused attention on problems of differences of standards of the three countries which caused great difficulty while the countries were attempting to co-ordinate their war efforts.

William L. Batt, vice chairman of the War Production Board, in his address to the general meeting asked that the United States, Great Britain and Canada capitalize upon the great advances made in standardization during the war.

"Now that the fighting phase of the war has ceased," said Mr. Batt, "no doubt some of the pressure for these improvements will vanish. Yet it is clear if standards in manufacture are of value to manufacturers within a nation, they are no less valuable to manufacturers engaged in world commerce. I am among those who believe the way to eliminate economic frictions is to facilitate trade, and it is clear to me that different standards of screw threads will always be an obstruction to easier trade.

"Eugineers must see the unification of standard: through to a final conclusion. The governments of our countries must assist through wholehearted encouragement in the work of this project. All of us have recognized how vital it has been to combined war production. Let us now have uniform standards and thereby strike a blow for peace."

The fundamental differences between British and American screw thread forms were resolved to the point where delegates were prepared to return to their homelands with a specification for a basic thread form that would provide a unified standard for all countries employing the "inch" system.

This basic form retains the best features of the present forms and at the same time a series of associated diameters and pitches were worked out which it is believed will simplify existing practice and yet provide an adequate range of choice for all general requirements. The proposal on a basic thread form was considered by the delegates as the outstanding accomplishment of the conference.

Also important is an agreement reached on Acme and Stub-Acme threads, used extensively on aircraft, machine tools and other mechanical devices where a traverse motion is required. While these specifications will be submitted to industry in the three countries through the national standards bodies, representatives attending the conference believe that what they term an A-B-C standard will be speedily approved.

Differences in drawing practices, particularly between the United Kingdom and the United States, were explored and considerable data exchanged by the delegates.

A meeting held on pipe threads, while not conclusive in its lindings, resulted in an invitation to British and Canadian representatives to continue discussions at the convention of the American Petroleum Institute which will be held in November.

International Standards Group Formed

CONSTITUTION for a new and expanded international standards organization was drafted at a meeting in New York recently, and a new name, the International Standards Co-ordinating Association, was announced.

The meeting had been called by the United Nations Standards Co-ordinating Committee which was organized last year to promote more uniform standards among the Allied nations as a phase of the war effort.

The next meeting is scheduled for London between April 15 and May 15, 1946.

Headquarters for the new organization have not yet been decided upon, but in all probability will be either New York or London where at present the two principal offices of the UNSCC are located.

The meeting in New York followed a

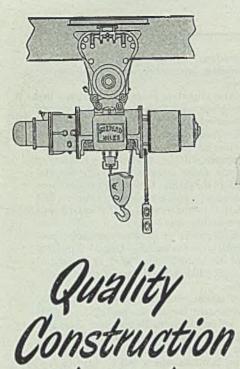
two weeks meeting of the Screw Thread Standards group in Ottawa, Canada, at which considerable progress was made.

While 13 countries were represented, others are expected to be included in the meeting in London next spring. The New York meeting was called before the end of the war and no change was subsequently made in the countries invited to attend. Thus, such neutral countries as Sweden and Switzerland were not invited, nor of course, the enemy countries.

Countries represented at the recent meeting included Australia, Belgium, Brazil, Canada, China, Denmark, France, Great Britain, Mexico, Netherlands, South Africa, United States and Russia. Czechoslovakia, although a member of the UNSCC, was unable to be represented at the conference.



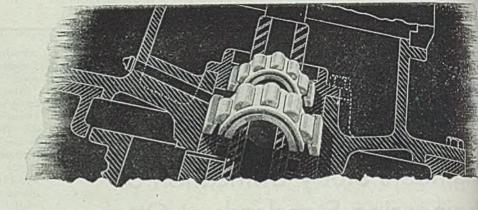
Delegates to the United Nations Standards Co-Ordinating Committee meeting in New York, Oct. 8-10, are shown above. Left to right: 11. J. Wollner, secretary in charge of UNSCC New York office; P. G. Agnew, secretary, American Standards Association; J. Morel, representing Belgium; Col. 11. Wong, representing China; C. le Maistre, secretary in charge of UNSCC London office



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MIRRORS of MOTORDOM

Automotive Council for War Production bows out after lauding wartime accomplishments of industry at Detroit dinner. General Motors president calls for realistic wage-price policy during reconversion period

VALEDICTORY dinner of the Automotive Council for War Production last Monday brought together, probably for the last time, the greatest assemblage of military and industrial brains ever to join in communal feast. A seemingly endless speakers' table shone with 46 top officials of every automobile company (except Ford which was represented by M. L. Brocker, production chief), many of the leading parts manufacturers, government representatives, Army, Navy and Air Force generals, including Lt. Gen. W. S. Knudsen, Lt. Gen. James H. Doolittle, Lt. Gen. Levin H. Campbell, Brig. Gen. A. B. Quinton Jr., Brig. Gen. Gordon M. Wells, Commodore Dixie Kiefer and others.

Sitting before this resplendent array of brass and overflowing from the Book-Cadillae ballroom into adjoining dining rooms were 1000 visitors, representing the cream of automotive officialdom who had willingly planked down \$7.50 each for the victory dinner. Probably the hardest hit of all hostelries here during the war from a culinary and refreshment standpoint, the hotel produced assorted cocktails, roast sliced tenderloin of beef, sauterne wine and other trimmings for a menu in sharp contrast to those served at state dinners the past few years.

The dinner was preceded by receptions for those at the speakers' table and for the press and radio. The ballroom itself was decorated with flags of the United Nations and posters attesting the military production record of the council members, including in all about 550 companies.

Advocates 600,000-Man Air Force

One of the principal speakers was General Doolittle, fresh from an address earlier in the day before the Economic Club of Detroit in which he reviewed the war record of the Eighth Air Force. He made a plea for continued recognition of the might of air power, but paid tribute to all arms of the service which he advocated bringing under the direction of a single department of national defense. He further recommended maintenance of a standing air force comprising 600,000 men and 65,000 airplanes.

Alvan Macauley, Packard chairman, president of the now-defunct ACWP and toatmaster for the evening, was presented with a radio by the council for meritorious service rendered as president since its organization.

General Campbell paid high tribute to automotive members of the industry-ordnance team and warned against a return of the lassitude in respect to preparedness which preceded World War II. He cited need for continued research and development in ordnance, pointing out that if appropriations of \$50 million annually could be made to advance this work for the next 20 years, the total expenditure would be the equivalent of ordnance production in a single month (April) of this year. However, he did not appear overly enthusiastic concerning prospects for such expenditures being made. Many echoed his sentiments when he said, "We are all tired. We are tired of war. We are tired of generals. We are tired of admirals. But we cannot slip again into unpreparedness."

General Knudsen eulogized the industry's efforts at the start of the war in gearing for all-out production, and said it was but the natural outgrowth of the industry's recognized knowledge of and skill in tooling methods.

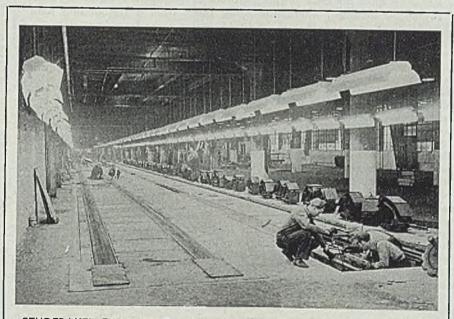
Keynote speech was made by C. E. Wilson, General Motors president, who reviewed the inception and development of ACWP, observing, "Our enemies did not think that free men, in a free competitive society, in a democracy, could co-operate efficiently and effectively in a common cause. The fact we could and did was our real secret weapon."

But the crux of Wilson's comments was in his references to current demands of

union labor for a 30 per cent increase in wages. Significantly, he stated, "The fact that we financed less than half the cost of the war by taxation and more than half by the sale of government bonds. has created the problem of continuing inflation. To millions of Americans the war has looked like prosperity, but to other millions it has been a great hardship. This situation must be corrected in the interests of all Americans. But American industry and business cannot follow the example of government and spend twice what it takes in. For industry, farmers and business generally money does not grow on trees, nor come from printing presses. Over any important period of time, business must take in more than it spends. We cannot solve this postwar problem by juggling with the value of money.

"Only hard work, jobs, efficient production and distribution will solve it. But current and wartime deficit spending and the longer hours worked at high wages during the war created a major postwar problem. Temporarily, while we are liquidating the war, there must be a sound national wage-price policy to stabilize and expand the economy. Unless the facts are recognized and sound measures promptly taken to solve this problem, in a way that is fair to all Americans, our second all-out effort to meet the situation will bog down.

"Briefly summed up, the present OPA formula given the automobile industry for figuring prices on 1946 models assumes that the average profit margins of the years 1036 ihrough 1939 were normal,



STUDEBAKER EXPANDING: More than a half mile of fluorescent lighting is being installed on the passenger car inspection line in Studebaker's \$16 million reconversion and expansion program. Two conveyors of flush-floor type will permit workers to circulate freely around the automobiles as the cars progress through a sequence of final operations

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MIRRORS of MOTORDOM



SPEEDS HEAT TREATING: Adaptation of high-frequency induction heating to production by Studebaker Corp. has reduced the time of heat treating starter ring gears from 2½ hours to 20 seconds. Instead of heating the entire gear in a gas furnace, only the teeth, where high hardness is specified, are subjected to treatment. The ring gear is placed on a brass fixture inside the field of a two-layer coil. As the fixture spins at 75 rpm, current at 540,000 cycles is applied and automatically shuts off once the temperature of the teeth reaches 1500° F (within 13 seconds), whereupon water spray from a surrounding tube quenches the part for seven seconds

and are required to perpetuate our free competitive industry. But this formula compels an increase of more than 50 per cent in production to achieve these same profit margins. This formula means that, even with the increased volume to attain this prewar profit margin, prewar individual worker efficiency must be reestablished, overhead expenses must be reduced to prewar levels and technological improvements in new machines and equipment must be sufficient to cover the added expense of depreciation and taxes on such new machines and equipment. Furthermore the formula makes no provision for reconversion costs or for losses incurred until prewar efficiencies have been regained and postwar capacity production achieved. Nor does the formula have any provision for any current wage increases.

"On the average, factory wages have been increased from 5 to 10 per cent since 1942 car prices were established. They are now the highest wages the industry has ever paid and are materially above the prevailing national wage levels for similar skill and effort.

"As the matter stands, the automobile industry faces a tough job and no additional increases in wages can be made unless corresponding increases are made in car prices. We know that to treat everyone fairly any general increase in automobile wages will sweep through the country—that all of our suppliers and all those engaged in business and industry and distribution must get a corresponding adjustment.

"The industry is in the middle—neither so-called collective bargaining nor shotgun bargaining will solve the problem. A sound national policy must be adopted and subscribed to by all while the critical period of shortages following the war exists, while we are liquidating our tremendous war effort, while we are rehabilitating the casualties of the war and while we are helping peoples in other parts of the world to rehabilitate themselves and avoid starvation.

"Along with many others in the country, the automotive industry stands for . . . equal opportunity for all, personal

responsibility for individual welfare, no leaning on a benevolent or bankmp government, freedom from coercion for all, and no favors by government for any individual or group."

This is a lengthy quote, but it so typifies general industry thinking it should be read into the record. The sad part of it is that Mr. Wilson's sound observation fell on ears which were favorably, if ou enthusiastically, inclined to all he said

There were a few conspicuous absenter from the victory dinner. Among the was George Mason of Nash-Kelvinato under whose signatures invitations ha been sent. Another was Henry Ford II, director of the council.

Concluding speaker on a lengthy list d orators was C. C. Carlton, vice president of Motor Wheel Corp. and a council view president. The hour was late so, when called upon, he merely presented a com of his address to MI. Macauley and said "Here is a good speech, but I am not go ing to give it." The applause was ter rific. However, in his prepared com ment he explained the nation's great ness in industrial production as the result of setting up mass production for the benefit of the masses of consumer and the peculiarly American competition effort to capture the public favor by rep dering it the service it wants. It wa competitive pressure alone which intr duced shorter working hours in industry labor-saving devices and machines, bette plants and working conditions. Ile d clared, "as long as the American peop permit us to compete for their fam through further improvements in the mastery of mass production, no reason exists why the problems of the postwfuture should cause us to fear or doubt All that we need is a better understand of what makes the American way tick

Returning to the subject of Ford again the tip is being passed around Detroit to watch for an atomic bomb to be dropped on the industry in the form of a radcally new approach to labor-managemerelationships. This could take one of several forms—plant-wide incentive sptems supported by the UAW-CIO, somform of profit sharing by employees, of participation in ownership of the company. The younger Ford is extremely sociconscious and there are signs he may b preparing some startling innovations alothe above lines.

Some months ago STEEL described he the Ford management was working of incentive systems for application in t Ford steel mill departments, how the would result in reduced employment he increased earnings for those remain at work, and how the UAW-CIO has accepted the proposals when all the carb were laid on the table. Perhaps such system, extended to all productive a nonproductive departments and "sold" t union leaders, would provide the answ to the serious trouble in which the dustry finds itself today on the score of productivity and efficiency.



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MEN of INDUSTRY-



HOWARD SPENCER

Howard Spencer, inventor of the Amsler-Morton soaking pit, has joined the Salem Engineering Co., Salem, O. After attending Carnegie Institute of Technology, he became associated with Chapman-Stein Co., Rust Engineering Co., Amsler-Morton Co., Loftus Engineering and Spencer Furnace Co. At present Mr. Spencer and Bert Hall, manager of Salem Engineering's Canadian office are spending a short time at the company's offices in England.

Dr. Francis C. Frary, director of research, Aluminum Co. of America, Pittsburgh, has been elected by the American Section, Society of Chemical Industry, to receive the Perkin medal in recognition of his outstanding accomplishments in the field of industrial research. Presentation of the medal will be made Jan. 11, 1946.

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J. J. Smith has been appointed manager of the Schenectady plant, American Locomotive Co., New York, succeeding W. L. Lentz, who recently was promoted to vice president in charge of manufacturing. Mr. Smith's assistant managers are: David T. Coleman, in charge of personnel, and Walter C. Rockenstire, in charge of manufacturing. Mr. Smith has been with the company since 1944 as assistant manager of the Schenectady plant.

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Earnshaw Cook, chief metallurgist, American Brake Shoe Co., New York, is resigning Jan. 1. Mr. Cook has been with the company since 1933, and was appointed chief metallurgist in 1939. He also served as consulting metallurgist since 1943 for the Kellex Corp., New York, which was responsible for an important phase in developing the atomic bomb. Mr. Cook will continue in a consulting capacity with the company and will engage in a limited amount of consulting work on steel mill and foundry problems. Raymond H. Schaefer will succeed him as chief metallurgist. Mr. Schaefer joined the company in 1940 as assistant foundry metallurgist, American



FRANK J. DONOVAN

Manganese Steel Division, Chicago Heights, Ill., and was transferred to the main plant in Mahwah, N. J. in 1943 as assistant chief metallurgist.

Frank J. Donovan has been named to succeed A. Harold Frauenthal as president and general manager, Kaydon Engineering Corp., Muskegon, Mich. Mr. Frauenthal has been elevated to the newly created position, chairman of the board. J. F. Oehlhoffen, formerly assistant to the president, has been appointed to the newly created position of vice president in charge of sales; G. A. Peters, formerly assistant secretary-treasurer, becomes treasurer, and Mrs. Pernelle R. Finch will be secretary. Mr. Frauenthal organized the Kaydon corporation in 1941 and Mr. Donovan has been associated with the organization as secretarytreasurer since its inception.

Fred C. Smith has been named director of quality, Tube Turns Inc., Louisville, Ky. Prior to joining the company in January, 1943, as chief metallurgist, he was field metallurgist for Carnegie-Illinois Steel Corp., Pittsburgh.

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William E. Klingeman has joined Precision Welder & Machine Co., Cincinnati, as chief engineer. Mr. Klingeman until recently was assistant sales manager, Federal Machine & Welder Co., Warren, O.

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H. Vernon Stehl has been appointed district sales manager, Baltimore branch of the Milcor Steel Co., Milwaukee. He succeeds Robert S. Schmieder, who recently was named general sales manager.

Lewis J. Male, assistant general superintendent, Schenectady works, General Electric Co., Schenectady, N. Y., has been appointed general superintendent succeeding Bernhard G. Tang who has retired after more than 45 years' service with the company. Mr. Male was appointed assistant general superintendent of the Schenectady works in June, 1944. Mr. Tang joined the company in l and has been general superintendent Schenectady since 1928.

R. O. Nash has been appointed Louis district manager in charge of s and service activities, Whitcomb L motive Co., Rochelle, Ill. He previ ly had served as special represental Railroad Division, Socony-Vacuum Co. in St. Louis.

C. F. Borden, former manager of general sales service department, Get Steel Co., Geneva, Utah, has been na district manager of sales for nord California, Kaiser Co. Inc., Iron & S Division, Oakland, Calif. Richard Erlin has been appointed manager sales service.

Carle W. Blade has been appoin carbide representative in the south and western Connecticut territory, Fi Sterling Steel Co., McKeesport, Pa. Blade will have his headquarters in H ford, Conn.

Andre Baudat, formerly supervisor equipment engineering, Boeing Airo Co. of Canada, Vancouver, B. C., signed that position to take charge of manufacturing operations for Swa Freezer Mfg. Co., Seattle.

J. M. Livingston has been appoint sales engineer, Standard Transformer Warren, O., and will have the north sections of Illinois and Indiana as his to ritory.

Charles T. Evans Jr. has been appered chief metallurgist, Elliott Co., Janette, Pa. Mr. Evans formerly was mager of the carbide department of the Titusville plant, Universal-Cyclops Ster Corp., Bridgeville, Pa.

Ralph W. Payne has been name southern representative on railway ? cialties, general castings and made work, Pittsburgh Steel Foundry Con Glassport, Pa. He will have offices Washington.

J. E. Grannis has joined Westinghe Electric Corp., Pittsburgh, as sales is velopment manager for the Electric I pliance Division, Pacific Coast distri-He will have headquarters in San Fracisco.

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Casper J. Sengenberger retires as accountant, Waukegan, Ill., works, Amican Steel & Wire Co., Cleveland, & more than 45 years' service. Vincen Hossack has been appointed chief countant at Waukegan succeeding he

Reid B. Gray has been appointed rector of the Reynolds Research Instia subsidiary of Reynolds Metals Co., c ceeding Dr. Warren J. Mead, who resigned to give more attention to

MEN of INDUSTRY

duties as head of the geology department, Massachusetts Institute of Technology. Associated with Mr. Gray will be J. Edward Spike, Boston, and Carl B. Hamlin, Findlay, O. Emil Kern has been appointed chief mechanical engineer of all rolling mills and auxiliary equipment, Reynolds Metals Co., Richmond, Va.

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Nelson J. Reinhold, representing the Hewitt Rubber Corp., Buffalo, and R. U. Jackson representing Robins Conveyors Inc., Passaic, N. J., a subsidiary com-pany, with H. N. Kepler, sales engineer, form the staff of the newly opened Charleston, W. Va. office of the Hewitt Rubber Corp. Mr. Reinhold formerly was associated with the Cincinnati Rubber Co., and Mr. Kepler was transferred from the Hewitt's Washington office.

-0---Winston C. E. Prins, consulting industrial engineer in the midwest for 15 years prior to serving as consultant with the Navy Department, bureau of ships, has returned to Chicago to resume his professional work. During the war, Mr. Prins served as consultant to manufacturers and both Navy and private shipyards, also as special assistant to the industrial survey board of the office of the Secretary of the Navy.

Grant Sturgis has been appointed development engineer, parts and service operations, GMC Truck & Coach Division, General Motors Corp., Detroit. Mr. Sturgis formerly was eastern warehousing manager, Chevrolet Motor Co.

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Junius S. Morgan, member of the board, J. P. Morgan & Co. Inc., has been elected a director, Continental Can Co. Inc., New York.

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Arthur H. Brown, who has been associated with Lukens Steel Co., Coatesville, Pa and subsidiaries since 1930, has been named manager of sales for Pittsburgh and vicinity.

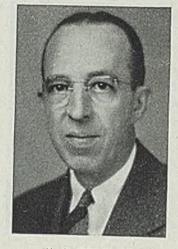
Wayne Brinkerhoff, formerly manager of technical data service, has been named advertising manager, B. F. Goodrich Chemical Co., Cleveland. Mr. Brinkerhoff has been with the company and its parent organization, B. F. Goodrich Co., Akron, for about two years, before which he had for six years been on the advertising and public relations staff, Monsanto Chemical Co., St. Louis.

R. P. Tyler has been elected a director, Macwhyte Co., Kenosha, Wis., succeeding Mrs. George S. Whyte, resigned. Mr. Tyler also is general sales manager of the company.

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R. D. Birge has been appointed Detroit representative, Philco Storage Battery Division, Philco Corp., Philadelphia.

Richard D. Elwell, who recently has been released from the Navy, has joined McKinsey & Co., New York, manage-



M. E. CUMMINGS

ment consultants. Before the war, Mr. Elwell was head of the merchandise preparation department, Montgomery Ward & Co. Inc.

M. E. Cummings, previously manager, Sanderson works, Syracuse, N. Y., has been appointed assistant to the president, Crucible Steel Co. of America, New York, and will be in charge of operations for Crucible's specialty mills. E. T. Walton has been appointed assistant to the vice president and will be located in Pittsburgh. He formerly was associate director of metallurgy. R. K. Warren, previously chief mill metallurgist succeeds Mr. Cummings as manager of the Sanderson works and R. Schempp has been appointed assistant to the works manager, Halcomb works, Syracuse. Mr. Schempp previously served as chief metallurgist of the Syracuse district. L. S. Fulton, previously service metallurgist. Park works, Pittsburgh, has been appointed manager of alloy sales. J. D. White has been appointed consultant to the company and is located at the Chicago branch. He formerly was Chicago branch manager and recently completed 50 years' service with the company. E. K. Streeter, manager, Milwaukee branch, has been appointed Chicago branch manager, and he is succeeded by J. D. White Jr. Mr. White has returned to Crucible Steel after serving nearly five years in the United States Navy, retiring as com-mander. He previously was service engineer at the company's St. Louis branch.

Elmer C. Salzman, vice president in charge of export operations, Robins Conveyors Inc., Passaic, N. J., left Oct. 12 to spend several months in England in an effort to bring the company's activities there up to the prewar level.

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George H. Tulley has been named assistant sales manager, Metals Refining Co., Hammond, Ind., a division of the Glidden Co., Cleveland.

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-0-William G. Succop has been named to succeed his father, the late Clarence F.



CLYDE R. PATON

Succop as president, American Roller Bearing Co., Pittsburgh. Mr. Succop has been associated with the company for several years in sales and administrative capacities. Carl Knaak, general manager, retains that position and in addition has been clected executive vice president.

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Clyde R. Paton, until recently director of automotive engineering for Packard Motor Car Co., Detroit, has been named consulting engineer by the Ford Motor Co., Dearborn, Mich., (STEEL, Oct. 8). In 1942, after 10 years as chief engineer at Packard, Mr. Paton joined Allison Division, General Motors, later going to the African Middle East theater, where he investigated operational failures of aircraft, at the request of the AAF and the RAF. Following this assignment, he was named executive engineer of the Allison Division. In 1944, he was called back to Packard as engineer-in-charge to establish new aircraft engine development and flight test facilties for the AAF at Toledo and Willow Run.

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Frank C. Tippery has been appointed works manager of the Ithaca, N. Y. plant, Morse Chain Co., Ithaca, a division of Borg-Warner Corp. Mr. Tippery formerly was with Ford Motor Co.

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Robert B. Ackerman has been elected vice president and E. B. Williams, vice president in charge of engineering, American Ship Building Co., Cleveland. During the war Mr. Ackerman served as vice president and treasurer, Delta Shipbuilding Co., New Orleans, a subsidiary of the American Ship Building Co. Mr. Williams formerly was vice president in charge of engineering at Delta.

J. W. Kern has been appointed regional manager of the territory which includes California, Arizona and western Nevada, Replacement Division, Perfect Circle Co., Hagerstown, Ind. He re-places Jack Taylor who has been transferred to the factory. Mr. Kern recently has been honorably discharged from the

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MEN of INDUSTRY



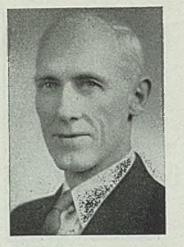
DAVID F. AUSTIN

Who has been elected vice president, sales, United States Steel Corp. of Delaware, Pittsburgh, noted in STEEL, Oct. 8 issue, p. 95.

Navy after serving for almost five years. William E. Hays has been assigned a southwest district and will make his headquarters in Tulsa, Okla.

Dr. Wendell F. Hess, professor of metallurgical engineering and head of the welding laboratory, Rensselaer Polytechnic Institute, Troy, N. Y., has been elected president, American Welding Society. He assumed office at the society's annual meeting held in New York, Oct. 18.

B. M. Davenport, formerly affiliated with Win. Sellers & Co. Inc., Philadelphia, has become connected with A. Milne & Co., New York, as a member of its Philadelphia office sales staff. W. J.



T. F. DORSEY

Who has been appointed general manager, Fort Pitt Division, Pittshurgh Steel Foundry Corp., Glassport, Pa., STEEL, Oct. 8 issue, p. 95.

Perreault has been appointed to the company's sales staff in Chicago. Mr. Perreault formerly was associated with the Wyckoff Drawn Steel Co., Pittsburgh, and for the past three years has served in the inspection department, Chicago Ordnance.

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Abner L. Cohen, M. Cohen & Sons Co., Cleveland, has been elected president, Northern Ohio chapter, Institute of Scrap Iron & Steel Inc., succeeding David C. Holub, D. C. Holub & Co., Akron. Mr. Cohen also becomes a member of the board of directors of the national institute. Other officers of the chapter include: First vice president. Jack Levand, Luria Bros. & Co. Inc., Cleveland; sec-



FLOYD ROSE

Who has been elected chairman of the Firth-Sterling Steel Co., McKeesport, Pa noted in STEEL, Oct. 15 issue, p. 1

ond vice president, Manly R. Ba Summer & Co., Cleveland; secon Joseph B. Horwitz, Joseph B. Horwit Cleveland; and treasurer, Browne A. pero, Max Friedman Co., Cleve David C. Holub, retiring chairman of chapter, was elected chairman of the ecutive committee.

John H. Greenland has been elvice president in charge of manufa ing, Hickok Electrical Instrument Cleveland. Mr. Greenland joined Hickok organization in June, 194 assistant general manager and direct labor relations. Paul Willour, wh been controller and assistant treat has been promoted to treasurer.

OBITUARIES . . .

John D. Croneweth, 84, co-founder and chairman of the board. Great Lakes Foundry Sand Co., Detroit, died in Henry Ford Hospital in that city, Oct. 14, after a brief illness.

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Cordon G. Campbell, 52, president, Oxford Tool Co., Philadelphia, died Oct. 13 at his home in Upper Montclair, N. J. Mr. Campbell had been president of the Oxford company since 1932.

Fred W. Miller, 62, president, Hinsdale Mfg. Co., Chicago, died Oct. 12 in Evanston, Ill.

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Robert L. Spencer, 58, dean, University of Delaware's School of Engineering for more than 17 years, and at one time combustion engineer for the Bethlehem Steel Co., died at his home in Newark, Del., recently.

Whittier Perdue, 76, consulting engineer, Ramapo Ajax Division, American Brake Shoe Co., died Oct. 12 in Chicago.

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Mr. Perdue had served as chief engineer of the Ramapo Ajax Corp., prior to its becoming a division of American Brake Shoe Co.

Harry Guilbert, 63, director of safety and personnel, Pullman Co., Chicago, died Oct. 10.

Cal Sivright, 59, who retired in 1944 as chairman. Oliver Corp., Chicago, formerly the Oliver Farm Equipment Co., died Oct. 10 in Evanston, Ill. 11e became associated with the company in 1930.

Richard W. Pearce, 70, since 1924, secretary-treasurer. Eggers Iron Co., Chicago, died Oct. 10 in Oak Park, Ill.

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Frank II. Otis, 87, Utica, N. Y., who at one time operated the Otis Machine Works, Rochester, N. Y., died recently in Utica.

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John X. Farrar, 56, assistant secretary and advertising manager, Jeffrey Mfg. Co., Columbus, O., died Oct. 11 in that city. He had been with the con for 32 years.

Carl E. Gebuhr, 64, assistant manager, Giddings & Lewis Ma Tool Co., Fond du Lac, Wis., died 13 in a Chicago hospital. Mr. G had been associated with the ma tool company for 35 years.

Edward G. Gustafson, 60, trea Independent Pneumatic Tool Co. cago, died Oct. 12 in that city. Il been associated with the company 1903, serving as treasurer for 30

Alfred J. Klug, 60, sales repretive in the Cleveland area for the ington Pump & Machinery Corp., son, N. J., died Oct. 14 in Clevelan

George V. Blades, 61, co-founded head of Camm Blades Machinery Milwaukee, manufacturers' agent, recently in that city.

Col. Mclvorne J. McCombs, pres and general manager, Buckeye 1 Corp., Dayton, O., died recently.

ITE

ernment's surplus property disposers can settle. At present only one finm bid has been put into writing—that of Colorado Fuel & Iron Corp., which offered to lease the plant providing the govern-

ment would invest an additional \$73 mil-

posed reduction in congressional appropriations for the Bureau of Mines will

result in closing of numerous metal research centers. Among those which probably would be affected in the West

are iron and steel laboratories main-

tained by the Bureau of Mines at Red-

ding, Calif., and Laramie, Wyo., alumina

pilot plants in the Pacific Northwest and

magnesium research centers at Boulder

City, Nev., and Salt Lake City.

Western mining interests fear a pro-

lion for supplemental facilities.

Navy To Maintain Expanded System Of Naval Bases on Pacific Coast

Fleet operation centers to be continued at important points. Training schools, amphibious bases, air stations and repair facilities to be retained on sizable scale. Decision is important to metalworking industries on Coast

SAN FRANCISCO

POSTWAR plans of the Navy assure the West Coast of an expanded system of naval bases, a fact of importance to a large number of corporations engaged in metal production and fabrication.

According to reports reaching here, the Navy plans to maintain fleet operation centers at San Francisco, at San Pedro and at San Diero in southern California, and on the Puget Sound in the Pacific Northwest. In addition it will retain a number of training schools, amphibious bases, air stations, small repair bases, laboratories, reserve berthing sites, ammunition and supp'y depots, hospitals and medical research centers at various points on the Pacific Coast.

It is understood the Navy is seeking full operation of a number of private industrial plants so that immediate conversion to Navy needs can be accomphished if and when such plants are needed. They include the following Califomia companies: American Forge Co. at Berkeley, National Supply Co. at Torrance, Pacific States Steel Corp. at Niles, Phelps-Dodge Copper Co. at Los Angeles and Western Gear Works at Los Angeles.

The Navy plans to retain its interest in several major shipyard facilities on the Pacific Coast, including Bethlehem Steel Co. yards at San Francisco and San Pedro; Ceneral Engineering & Drydock Co. at Alameda; Los Angeles Shipbuilding & Drydock Co., San Pedro; and United Engineering Co., Alameda.

New Plant Expansions

New industrial developments on the West Coast continue to be featured by plant expansion projects in preparation for an increasing slice of postwar business. Latest announcements come from two major California companies, Food Machinery Corp. and Paraffine Cos. Inc.

Food Machinery plans to spend approximately \$3 million on development of new lines, with approximately a third of the amount going for research to find new and improved wys of producing cheaper and better foods.

Praffine Cos., largest West Coast producer of linoleum and an important maker of paints and building materials, plans to invest heavily in research. It has announced plans for an increase in research facility construction,

The Geneva Steel Works near Provo, Utah, has been ordered to close before Nov. 12. The plant is completing all war orders for ship plates and has no backlog of other business. Present payroll of 2100 workers is expected to be cut to 600 within the next week or two.

Whether Geneva ever will open again now is a question which only the gov-

Jobs Go Begging in Los Angeles with Idle War Workers Declining Lower Pay Positions

LOS ANGELES UNFILLED jobs in all categories in the Los Angeles area last week were at a postwar high of 56,212. The best available analysis indicates thousands of workers formerly employed at high wartime wages are refraining from accepting jobs at lower wages.

Metal industries in the area report the labor situration is uncritical, with some workers needed, particularly in unskilled requirements, although in the main plants are adequately manned. The one exception is in foundries.

The outlook for production in general is optimistic. During the next 12 months it is expected automotive manufacture will increase 167 per cent over any previous year's record. Refrigerator makers and builders of small motorized appliances see a 1000 per cent increase in the next few years.

Washing machines and vacuum cleaners will figure in a development having the proportions of a major industry within the next 20 months.

According to industry leaders, about 400,000 cars will be assembled here during the coming year, compared with the highest prewar record of 154,000 a year.

G. T. Bergstrom, plant manager of the American Can Co. factory at 4815 Santa Fe Ave., announced last week that production of cans for vacuum packed coffee for civilians will commence about Nov. 1.

Western steel users are formed into a syndicate with sufficient capital to buy the Geneva mill at Provo, Utah. or the Kaiser Co. mill at Fonlana, Ca'if., and are ready to do so in the event that other groups do not act first, Kenneth T. Norris, president, Norris Stamping & Mfg. Co., Los Angeles, said last week.

The Los Angeles manufacturer said he had conferred with Stuart Symington, Surplus Property Administrator, and John W. Snyder, reconversion director,

as well as others in the administration. "They told me they are cognizant of the West's problem," he said. "They want it worked out. It is generally accepted by western steel men that the best method is to make a cash offer for the Fontana mill, based upon the federal loan on the mill."

This offer, he indicated would be based on an overall loan of \$115,000,000 on the mill, made, however, at the extraordinary costs in operation during wartime. Such costs would need support of a steel price of \$185 a ton in the face of a current \$46 a ton average in the industry—an obvious 'impossibility.

Mr. Norris reiterated the western viewpoint that eastern prices plus water freight computed from Maryland is being charged for steel actually made at Torrance on Pittsburg, Calif.

The syndicate, he said, will insist that old style pricing policies be discarded, regardless of what organization eventually takes over either or both of the new western wartime mills.

J. F. Bone, Los Angeles Chamber of Commerce official, predited that "something very definite is in the making and an announcement may be made within the next ten days."

Other southern California industrialists, including Alden C. Roach, president, Consolidated Steel Corp., and E. S. Dulin, president, Byron Jackson Co., expressed viewpoints similar to that of Mr. Norris.

Mr. Roach said that steel that brings \$40 a ton in Pittsbur, h. sells for \$64.60 when delivered Ly rail to Los Angeles. Shipments by rail and water bring a price there of \$55. The Kaiser Steel Co. mill at Fontana charges the full \$64.60 pribe in agreement with the RFC.

He declared that the West Coast companies are entitled to prices on steel rolled here that would make such steel competitive with that rolled in the East. WING TIPS-

Commercial airlines add 4034 miles to routes in first three quarters, bringing total to 66,971 miles. Additions in past two years exceed total mileage of 17 years ago. Seven domestic carriers involved in major additions made this year

NETWORK of air routes available for the transportation of passengers, airmail, and cargo in the United States was increased by 4034 miles in the first three quarters of 1945. The total number of route miles which the airlines are now authorized to fly by the Civil Aeronautics Board has reached the all-time high of 66,971, according to a survey made by the Air Transport Association of America.

The new routes added to the domestic airline system of the United States up to Oct. 1, 1945, followed the establishment of 8435 miles of new routes in 1944. The total of 12,469 undertaken in these two wartime years substantially exceeded the country's entire system of airways only 17 years ago.

The principal awards of new mileage

thus far this year have involved seven domestic carriers, while others related to comparatively minor terminal changes. The largest single new extension in the history of the Civil Aeronautics Board was made when Delta Air Lines received a certificate to add 1224 miles to its system, both to the North and South. From Cincinnati, Delta was authorized to reach Chicago via Anderson, Muncie, and Newcastle. From Knoxville it was authorized to fly to Asheville and Greenville-Spartansburg. From there, one branch will go to Columbia and Charleston, South Carolina, while another branch will go to Augusta, Savannah, Brunswick, Jacksonville, and Miami.

Other major additions were: American Airlines received a net addi-



ALUMINUM TRUCK: This lightweight hand truck, built by Northrop Gaines Inc. for the peacetime industrial market, weighs about as much as one of the 30-lb aluminum ingots stacked on its chassis. The hand trucks are built by aircraft fabricating methods developed by Northrop Aircraft Inc., Hawthorne, Calif., parent company of Northrop Gaines tion of 653 miles to its system as the result of a reshuffling of three routes in the northeast section of the country. This same company also gained 43 miles as a result of linking Syracuse, Elmira-Corning, Binghamton, and Scranton-Wilkes-Barre.

Mid-Continent Airlines linked New Orleans with Tulsa, via Shreveport, Texarkana, Fort Smith and Muskogee with resulting gain of 584 miles.

Continental Air Lines was certificated for 519 new miles with a route between Hobbs and Tulsa via Lubbock, Wichitz Falls and Oklahoma City.

Eastern Air Lines was a gainer to the extent of 693 miles with an extension from Columbia, S. C., to Detroit vi Charlotte - Winston - Salem, Greensbore-High Point, N. C., Roanoke, Va., Akron and Cleveland.

Colonial Airlines was given a 715mile addition to its system by a combination of route extensions, the result of which was to give this company a link between Washington and New York in this country, with Ottawa, as well as Montreal in Canada. From Washingto, the new set-up will take Colonial through Baltimore, Reading, Scranton-Wilke-Barre, Binghamton, Syracuse and Watetown to Massena, N. Y. Thence our branch will go to Ottawa and the other to Montreal. The line will still operate to Montreal from New York City via Burlington, Vt. From Burlington it is now authorized also to go to Massena thence to Ottawa.

Pennsylvania-Central Airlines gains & miles and a link between Rochester, N. Y., and Washington, with a route that will now tie in Williamsport, Elmin-Corning, Rochester and Buffalo.

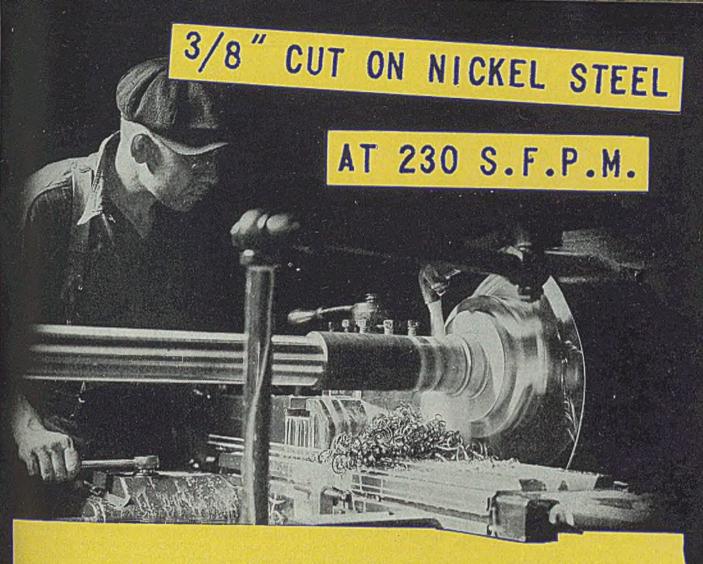
Curtiss-Wright To Build New Model of the Seahawk

Production of a new model of the Seahawk scout plane will be started each in 1946 by the Columbus, O., plant of Curtiss-Wright Corp. To be known as the SC-2, the new plane will be an improved version of the original Seahawk

Commitments for the purchase of a small number of these planes have been received by the company from the Navy Bureau of Aeronautics. Employment for the next few months will not be affected by this development, it was pointed on because production of the plane is n scheduled to begin until early next year

Timm Industries Inc. To Build Vacuum Cleaners

Formation of Timm Industries Inc., wholly owned subsidiary of Timm Arcraft Corp. to take over the production of the Timm vacuum cleaner and to it a large order for the manufacture of set drink vending machines has been arnounced in Los Angeles by Roy B. Buckley, president of the new unit.



SUNOCO EMULSIFYING CUTTING OIL

Proves its Worth Under Severe Operating-Conditions, Lengthens Life of Tools, Cuts Down Re-Grindings

When heavy cuts and heavy feeds are being taken on nickel steel and peak production is to be achieved it is essential to maintain accurate cutting-edges with long intervals between grinds.

Here is a case where a manufacturer's preference for Sunoco Emulsifying Cutting Oil is based on that type of performance.

OperationRough turning forged spindle
Machine Monarch 20" Model "M" engine lathe
material SAF 2350
Surface Cutting-Speed
Depth of Cut
Feed per Revolution
Type of Teel
Type of Tool
Cutting Lubricant 1 part Sunoco to 10 parts water.

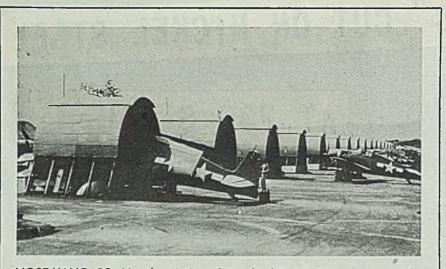
Sunoco has won the approval of leading machine-tool builders and metal-working plants for its outstanding work in a wide variety of tough metal-cutting operations like this on alloy steels, forgings, and other jobs where carbide tools are indicated.

The outstanding lubricating, heat-absorbing, and rust-preventive qualities of Sunoco make possible longer runs between regrinds, greater accuracy, better finish, fewer rejects, and worthwhile savings in production-time, Let a test, run on Sunoco in your own plant, under your own operating conditions, convince you.

SUN OIL COMPANY • Philadelphia 3, Pa. Sponsors of the Sunoca News-Voice of the Air-Lowell Thomas

SUNDCO SUN INDUSTRIAL PRODUCTS OILS FOR AMERICAN INDUSTRY

WING TIPS



NOSE HANGARS: Novel variation of standard Quonset structure provides nose hangars for fighter planes based on Guam. Shelters are used primarily for repair operations. U. S. Navy photo

Find Greater Safety, Efficiency, Economy Made Possible by Reversible Propellers

GREATER safety, greater efficiency, and greater passenger comfort in addition to an impressive saving in operating costs is made possible by the use of reversible propellers on large, high-performance, land-planes.

These are the conclusions of three aircraft engineers who presented their findings on weight reduction of aircraft braking systems to the Aeronautic Meeting of the Southern California Section of the Society of Automotive Engineers in Los Angeles recently.

The trio included: Wendell E. Eldred, landing gear design group engineer of Consolidated Vultee Aircraft Corp.; Henry II. Kerr, manager of aeronautical sales, Hayes Industries Inc., aircraft wheel brake manufacturer; and Harold H. Warden, installations manager of Curtiss-Wright Corp., Propeller Division.

They concluded that by using reversible propellers, airlines could increase payload and safety, decrease maintenance costs, lower initial cost, reduce brake system weight, and achieve greater passenger comfort, all while cutting operating costs.

To conduct their tests, a total of 70 landings and taxi runs were made with various combinations of wheel brakes and reversed propellers on a 100,000-lb Consolidated B-32 four-engine bomber, the first production aircraft to be equipped with reversible propellers.

The report stated that although the weight of the B-32's wheel brake system was reduced by 407 pounds, its landing run was substantially shottened by the use of reversible propellers and the smaller brakes. Based on airline estimates conservatively set at \$30 per year valuation per pound of weight saved the engineers predicted that airlines might thus realize an annual saving of \$12,000 or more for each aircraft of such size in operation.

The capacity for stopping aircraft with reversible propellers and smaller brake system is indicated by figures on one of the test runs. The aircraft employing 100 per cent no mal braking and no reversing of propellers required a landing run of 2230 feet. With reversible propellers and only half brakes the aircraft was landed in 1075 feet.

Brake jerking has been a common pilot and passenger complaint in the past due principally to maladjusted hydraulic system, unequal pressure, brakes of unequal wear, etc. Since these factors disappear when aerodynamic braking is used, the engineers expect that the use of reverse thrust will mean a smoother and more uniform landing-roll stop.

They also said that safety is increased by the presence of two completely independent braking systems. Although the wheel brake system size can be greatly reduced when used with propeller braking, it can serve alone, in an emergency, to stop the aircraft within the specified limit as proved by these tests.

Further, combined braking, they said, cannot be overstressed due to the additional safety when forced to land on small emergency airports or if obstructions accidentaly appear on the runways of adequate size airports. Also, propeller braking is equally effective on icy or wet runways as on dry concrete.

Another major safety factor is the ability to reverse either the two inboard or the two outboard propellers as well as all four simultaneously. In the event of an inoperative engine, the remaining pair of unaffected propellers can be reversed.

Finally, they pointed out that equipping standard propellers with the reverse feature in no way decreases the original aircraft performance efficiency but, rather, improves the performance through weight reduction.

Aircraft Parts Plants Are Offered for Sale by RFC

An aircraft parts plant occupying approximately 4½ acres at Cicero and Devision Streets, Chicago, is being offered for sale or lease by the Reconstruction Finance Corp.

The property, formerly operated by the Minneapolis-Honeywell Regulator Co. adjoins a tract of 2½ acres which may be acquired, if desired. The building, of 210,000 square feet, on the site is fac tory-type, two stories, of brick, reinforced concrete and terra-cotta construction, with monitor-type roof. It contains a sprinkler system and three elevators and is equipped with fluorescent and incandescent lighting.

Equipment consists of machine and portable tools, production items, furniture and fixtures.

The Birmingham (Alabama) plant for merly operated by the Bechtel-McCorr Corp. for aircraft modification, also is being offered for sale or lease by RFC. The property consists of 254 acres of government-owned land and 58 acres under 20-year lease. Buildings include modification, administration, training production, flight operations, paint and 10 minor structures of wood. Total floor area: 1,440,000 square feet.

Equipment includes machinery used in aircraft modification together with furniture and fixtures.

Seek Part of Convair Plant To Build Midget Automobiles

Negotiations for a lease of 45,000 sq ft of floor space in the Consolidated Vulter Aircraft Corp. plant 2 at San Diego, Calif., are reported under way by the Defense Plant Corp. and a newly organized corporation, the Bobbi Motor Car Co. The Bobbi company was formed to manufacture a 2-cylinder midget automobile with plastic body.

S. A. Williams, San Diego, is presdent of the Bobbi Motor Car Co. The proposed car would be powered by the one-cylinder gasoline engines located in the rear and would have a centringuaction clutch and chain drive, eliminating need for differential and transmission assemblies. Its backers say the car would develop about 16 horsepower, travel 50 miles on a gallon of gasoline, have a speed of 60 miles an hour, use standar wheels and tires, weigh less than 500 pounds and sell for \$399.

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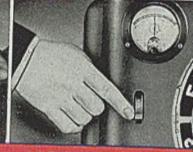
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Work Starts on **Brazilian Steel Plant Foundry**

Dual purpose facility to cost \$1,850,000 and will be one of . most unusual foundries in the Western Hemisphere

CONSTRUCTION of a foundry-one of the most unusual in the Western Hemisphere-for the large Brazilian National Steel project at Volta Redonda, Brazil, has been started.

The foundry, according to Roy I. Jones, head of the Industrial Engineering Division of Giffels & Vallet Inc., L. Rossetti, associated engineers and architects, Detroit, who designed the complete foundry project, will produce ingot molds and stools, iron grain and chilled rolls, steel rolls, miscellaneous iron, steel and nonferrous castings. The foundry which will cost approximately \$1,850,000 will pioneer in many ways the reduction of hand labor and the improving of working conditions in the Brazilian foundry industry.

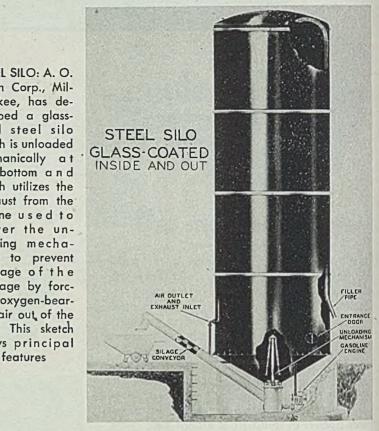
The foundry is a dual purpose facility. Half of the space is devoted to highly mechanized production systems for the regular supply of ingot molds and stools. The remaining half of the foundry is primarily for production of castings to keep the mill equipment in constant operation, and has facilities and equipment capable of producing any casting in the entire steel mill.

The foundry is designed so that ingot molds may be poured with hot blast furnace metal direct from the open-hearth mixers. Its equipment includes a cupola, air furnace, electric furnace, monophase furnace, nonferrous metal furnace, annealing furnaces, pit type ingot mold ovens, a completely mechanized sand conditioning and distribution system, casting and cleaning equipment, roll turning lathes, and ingot mold milling equipment.

The jobbing nature of this foundry's operations requires that it be, in addition to an ingot mold foundry, a steel foundry one week, an iron foundry the next, and perhaps a roll foundry the following week. This gave rise to the requirement that, in addition to the charging of the cupola, the arc furnace and air furnace would need to be charged at various times both with cold charges and with hot charges for duplexing.

The foundry has been designed for ready expansion to provide an additional 150 per cent capacity. Construction of the foundry is expected to be completed in about nine months, about the time when the main portion of the steel mill will be completed.

STEEL SILO: A. O. Smith Corp., Milwaukee, has developed a glasslined steel silo which is unloaded mechanically at the bottom and which utilizes the exhaust from the engine used to power the unloading mechanism to prevent spoilage of the ensilage by forcing oxygen-bearing air out of the silo. This sketch shows principal features



BRIEFS

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

Automatic Temperature Control Co. Inc., Philadelphia, has announced that George Goodman, specialist in industrial instrumentation and control equipment, has opened a new office at 1901 St. Paul St., Baltimore 18.

Clayton & Lambert Mfg. Co., Detroit, has purchased the plant, equipment, and inventories of the Hoffman Gas & Electric Heater Co., Louisville, and will operate it as Clayton & Lambert's Hoffman Division.

Continental Can Co. Inc., New York, has broken ground for a can plant in a model industrial community in Sacramento, Calif. The new plant will employ between 200 and 400 men and women.

-0-

Lukens Steel Co., Coatesville, Pa., was one of 38 firms in the Philadelphia area honored recently for outstanding contributions to American industrial progress in the last half century.

American Locomotive Co., New York, has purchased 11 of the 12 buildings erected by the government on land leased at the company's Schenectady,

-0-

252430

N. Y., plant. Some of the buildings with be devoted to development of a new line of diesel locomotives. The company is 95 per cent reconverted from wat work.

0-Superset Brush Co., Bellows Falls, Vt. has leased its entire production facilties and services for three years to Pittsburgh Plate Glass Co., Pittsburgh to supplement the latter firm's production while postwar demands for brushes are heavy.

Foote Mineral Co., Philadelphia, pro cessor of metals, alloys, ores and chemicals, has announced removal of its entire offices to 12 East Chelten Ave-Philadelphia 44.

Bell Aircraft Corp., Buffalo, has p nounced a contract for more than 1 million for manufacture of 5 hp ont cylinder gasoline engines at its Burling ton, Vt., plant for the Warren City Mg Co., Warren, O.

Dover Industries Inc., Chicago 18, 1 new enterprise organized to do manfacturing and jobbing of metal articles requiring plated finishes, has started operations at its plant, 2929 North Campbell Ave.

-0-

American Welding & Engineering Corp., Milwaukee, plans to build an additional factory building.

Roots-Connersville Blower Corp., Connersville, Ind., is making extensive improvements in its offices at the plant in Connersville.

International Detrola Corp., Detroit, has sold its Indianapolis machine tool plant and equipment to F. L. Jacobs Co., Detroit. International Detrola has transferred production and servicing of Libby turet lathes to its Elkhart, Ind., plant.

Pittsburgh Plate Glass Co., Pittsburgh, plans a \$500,000 addition to its Keene, N. H., plant to increase production of brush handles and staple-set brushes.

Westinghouse Electric Corp., Pittsburgh, has opened a laboratory at 420 South San Pedro St., Los Angeles, where western industry may submit for study its problems in high frequency heating. Director of the laboratory is Dr. Russell A. Neilsen, research engineer.

Chicago Steel Service Co., Chicago, has opened new offices at 757 North Broadway, Milwaukee, under direction of loe Viall, district manager. Hugo Jensen has been appointed assistant district manager. Paul H. Schlei, Fon du Lac, Wis., will resume his former post as salesman upon release from the Army.

Western Electric Co. Inc., New York, will construct an electronic components plant at Allentown, Pa. When operating at capacity the plant will employ 1500 people. A year will be required to complete the plant after construction begins.

Ceneral Electric Co., Schenectady, N. Y., reported that 45 per cent of its stockholders are women, 43 per cent are men, and 12 per cent are business enterprises.

Arms-Franklin Corp. Buys Taylor-Wilson Mfg. Co.

The Arms-Franklin Corp., Youngstown, has purchased control of the Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

New officers of Arms-Franklin are: M. I. Arms, chairman and executive vice president; H. M. Wilson, president; J. A. McCohn Jr., treasurer and assistant secretary; and O. A. Christiansen, secretary and assistant treasurer.

Raymond T. Klempay, formerly with the McKay Machine Co., Youngstown, has been appointed assistant chief engineer of Arms-Franklin, and is located in the latter firm's offices in the Mahoning Bank Bldg., Youngstown. Also located there is Alfred E. Balke, industrial engineer for Arms-Franklin. Mr. Balke formerly was with the Youngstown Foundry & Machine Co. and the Continental Foundry & Machine Co.

Mesta Machine To Furnish Mill for Allegheny Ludlum

Allegheny Ludlum Steel Corp., Brackenridge, Pa., has ordered from Mesta Machine Co., West Homestead, Pa., a continuous mill for cold rolling of stainless and silicon strip steel.

The four-high mill, consisting of four stands, will be installed at Allegheny Ludlum's plant at West Leechburg, Pa. Installation will be completed in about six to eight months.



FOUR STARS: Gent Machine Co., South Euclid, O., has been awarded the fourth star on its Army-Navy "E" burgee in recognition of shipping 110 million fuze parts during the war. Shown at the award ceremony are, left to right: Robert R. Gent, William A. Gent, Richard W. Gent, Capt. George Leonard, Arthur Gent, and Lt. Col. A. F. Witte

Two Steel Corp. Units Planning Improvements

Projects to modernize National Tube Co.'s Lorain, O., plant and American Bridge Co.'s Gary, Ind., plant announced

TWO United States Steel Corp. subsidiaries, the National Tube Co. and the American Bridge Co., last week announced plans to modernize and improve production facilities. Both projects are part of a long-range program begun before the war by U. S. Steel subsidiaries.

National Tube Co. plans to improve facilities for manufacture of buttweld pipe at its Lorain, O., works. The project is designed to improve production methods and to meet requirements of new housing construction. Under the program, production of standard pipe in buttweld sizes, three inches and smaller, by National Tube Co. would be concentrated at Lorain, according to C. R. Cox, president of the company. Improvements which will increase efficiency of the Lorain buttweld mills and related facilities are expected to be completed in 1946. Further development of these operations already is under consideration, Mr. Cox said.

American Bridge Co. plans to modernize its Gary, Ind., plant to meet increasing demands for fabricated steel.

Output of the Gary plant is expected to be increased substantially by the changes that have been planned, according to L. A. Paddock, president of American Bridge Co. Working area of the plant will be increased by nearly 10 per cent. Rearrangement of fabricating facilities and production equipment, increase and centralization of the welding area, enlargement of the under-roof painting area, and relocation and combination of certain service facilities are designed to improve postwar operations and service to customers.

Units of Union Carbide To Build New Facilities

Construction of facilities for distributing oxygen and acetylene is planned for Mobile, Ala., and Miami, Fla., by the Linde Air Products Co., a unit of Union Carbide & Carbon Corp., New York.

Another unit, Carbide & Carbon Chemicals Corp., also has announced plans for erection of a "Pyrofax" gas filling station at the Miami site.

Plans for both the Miami and Mobile projects include space for a warehouse for Union Carbide. The Miami plant is expected to be operating about Nov. 1, and the Mobile plant is expected to be in production about Dec. 1.

Standardized and Simplified

Exceptionally efficient handling methods take care of movement in processing huge quantity and variety of materials. Program is developed for effective plant layout to promote ease and safety in handling operations

FIVE hundred million lb of material pass through the Erie works of the General Electric Co. in the course of a year. As received, it ranges in unit weight from a few pounds to more than 10 tons. During manufacture, it must be carried over ditances ranging from a few feet between machines to more than a mile between buildings.

But more remarkable than the magni-

tude and complexity of the materialhandling work is the simplicity with which it is done. All handling operations are performed according to a wellthought-out and continuously supervised plan which includes a program of simplification and standardization of both handling methods and handling equipment.

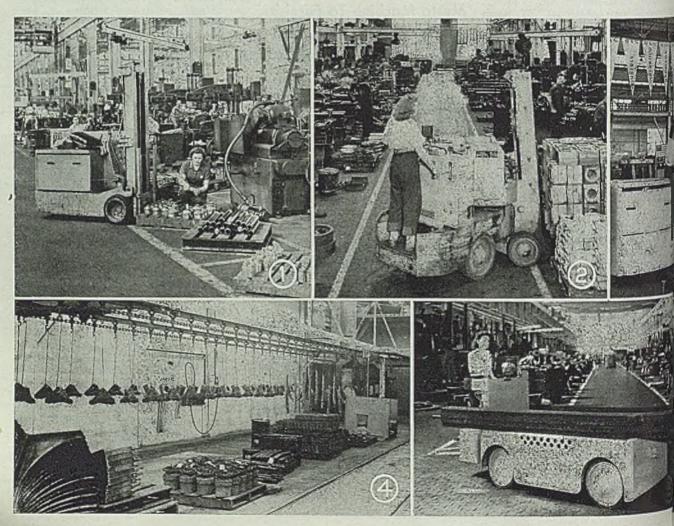
It includes also a program governing

By GEORGE E. STRINGFELLOW Division Manager Edison Storage Battery Division Thomas A. Edison Inc. West Orange, N. J.

the layout of storage and manufacturing areas to insure accessibility of material, safety of traffic, ease of receiving, handling, and di patch within the various division, and the elimination of bottlenecks and delays for loading and unloading the industrial rail cars and the highway-type trucks and tractors used for i..terdivisional hauls.

The operating zone of the Erie Works extends over an area of approximately one-half quare mile. It contains some 27,550 linear feet of paved roadway and 14½ miles of standard-gage railroad connecti..g the various divisions and buildings.

Largely because of the need for expeditious handling between as well as within the various division, standardization of method and equipment brings more than the usual advantages. To avoid needless waiting time and delays at transfer points, some means of quickly loading and unloading the interdivi ional carriers is necessary. To this end, any unit of material dispatched from one building must be adapted for ease of unloading by the handling equipment available in the building to which it is



dispatched. This is more easily accomplished when the methods and equipment throughout are, so far as possible, the same.

Another reason standardization has more than its usual advantages is that the p.oduction is variable. During peace-time many divisions are engaged in different kinds of work at different times of the year. During the war, it was found necessary to convert entire divisions to different work. Thus the amou.t of handling work in the various divisions is not constant. But it can easily be equalized when standard handling equipment is employed, merely by shifting the equipment from one division to another.

The general methods of handling, both based on the unit-load principle, have been adopted as standard. With minor exceptions, material having a unitweight up to 3 tons is handled by the pallet-fork-truck method, while heavier material and material that is too bulky for pallet handling (such as bar stock) is handled by crane.

The use of the pallet-fork-truck method is further simplified by the adoption of two sizes of pallets as standard: 4×4 ft and 3×3 ft. Variations in the bulk of the material result in three general weight groups: One-ton, 2ton, and 3-ton. This has made it possible to standardize on the three corterponding sizes of fork-lift trucks.

Standard industrial-truck equipment

for each division consists of (1) one or more fork trucks of any one, two or all these sizes (2) a varying number of pallet-handling hand-lift trucks, both with and without electric drive, to supplement the fork trucks, and (3) one burdenbearing truck, primarily for maintenance work and the distribution of bar stock.

In general, incoming material is palleted as it is received (if not shipped on pallets) and taken to storage by fork truck. If, for any reason, the car or truck in which it was received cannot be unloaded in the division in which it will be used, it is taken to storage by (*Piease turn to Page* 144)

Fig. 1—Division storekeepers act as dispatchers. After receiving order from dispatcher, truck operator checks order against contents of pallet load. Where operations require continuous trucking, operators receive orders direct from loads

Fig. 2—In old building modernized for ease and safety in handling, 8-ft aisle width was not available. So articulated fork truck is used, permitting placement of loads at 45° angle in narrow aisle as shown here. All photos from General Electric Co.

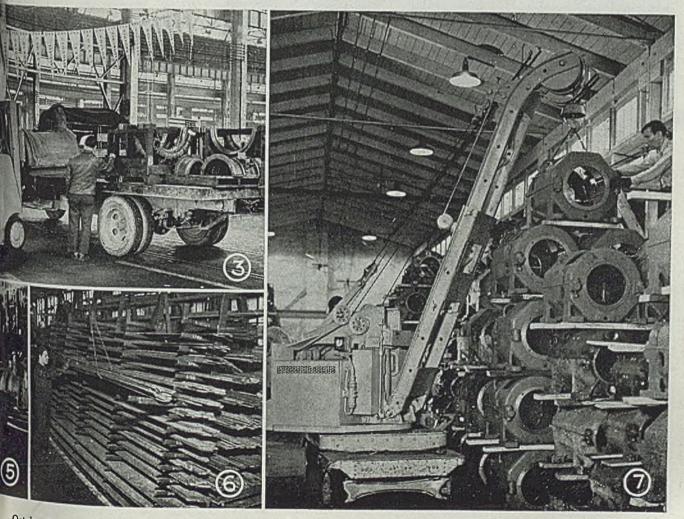
Fig. 3—Pallet loads to be moved from one building to another are quickly loaded by fork lift truck onto flat-bed highway truck. Unloading at destination will be done in same manner. Railcar hauls also are used. Ample loading space is provided at these transfer points

Fig. 4—Continuous overhead chain conveyor serving paint spray booth and drying ovens is arranged to provide convenient co-ordination with pallet-forktruck delivery and dispatch at the point shown here

Fig. 5—Flat-bed truck with narrow operator's station facilitates carrying bar stock. Stake pockets provide safe loading when carrying around stock

Fig. 6—Handling bar stock is simplified by this special type of rack which economizes on floor space and keeps several sizes individually accessible

Fig. 7—Motor frames are stored in building with ro crane service. Units are delivered from manufacturing area by fork-lift truck on pallets, then stored in tiers by crane truck as shown



Special High Production Units Are Featured In . . .

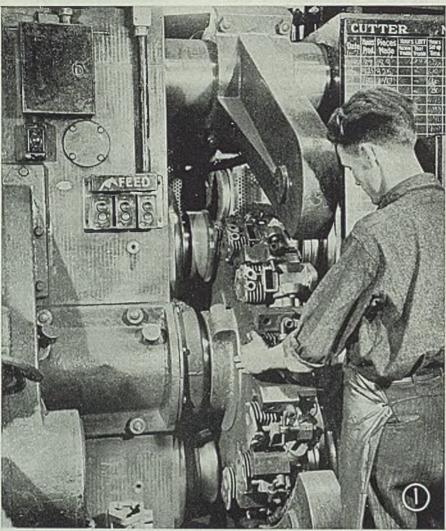


Fig. 2—First Natco special bores inside diameter, works bottom and magneto side of casting; units clamped bottom up here. Locating holes in base are drilled and reamed. Six stations, two castings per station; some stations have both vertical and horizontal heads; total of 34 tools used; facing tools, Carboloy tipped; drills, high speed steel

CYLINDE

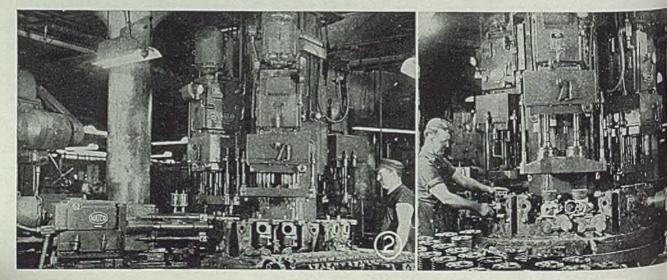
ACCOMPANYING illustrations showe of the most important operation in the machining line set up at Bri & Stratton Corp., Milwaukee, for finding the castings that constitute the m frame and cylinder for that compare well-known line of 4-cycle single-cycle air-cooled gasoline power plants.

From the small fractional horsepo unit used to drive the washing mach for the farmer's wife to the larger us employed to generate electricity for armed forces in out-of-the-way com of the world, these compact self-or tained units perform an increasingly v service.

Made in sizes from 2/3 to 6 hp, th engines employ different frame-and-cy der castings to accommodate vari mounting and size requirements.

Fig. 1—First unit: Special Dati Thompson rotary mill, 12 stations or rotary fixture driven by chain ridin over outside of castings from arms jun above and below loading point. Fixtur revolves continuously, is reloade while moving. Clamping is automatik Four cutters, one each side at top for roughing and one each side at botto for finishing, machine top and botto surfaces of castings. Stellite cutter run 60 rpm, have 28 blades mounter radially on roughing units, and at 10 tilt on finishing heads

Fig. 3—Second Natco special mounts casting top up for wo ing top and power take-off side. Here 62 tools are employ This also is a 6-station unit. From here, work goes to small y waukee mill with a double fixture for milling out valve chancover seats, and then on to broaching press, Fig. 4



MACHINING LINE

machining line shown here was designed to handle 16 different castings. Eight different castings are now being machined on it in regular production runs. Of course, tooling and fixtures are modified somewhat for each different casting.

Maximum output of the line is well toward 1000 castings per 8-hour shift. Present production is limited to less than this, due largely to difficulties in obtaining castings.

While the picture captions detail the operations, the sequence is roughly as follows: Machine top and bottom in vertical rotary mill (Fig. 1); face and drill bottom end and magneto side on first Natco special (Fig. 2); work on top and power take-off side on second Natco special (Fig. 3); mill valve chamber; broach pressure relief grooves, press in valve guides, test for tightness (Fig. 4); more work on top and magneto side in third Natco special; drill and tap in fourth Natco; precision bore main inside diameter of cylinder (Fig. 5); hone cylinder bore (Fig. 6); multiple tap (Fig 8); wash (Fig. 7).

Cylinders are made from a dense, closely controlled, heat and growth resisting cast iron (sand cast) containing copper and nickel additions. Raw castings are checked for location of bosses to assure proper wall thickness as they come in to the plant for machining. Pads are cast on the cylinder to provide locating points for first machining operaFig. 6—After boring, cylinders are honed on this Barnes Drill unit which removes a bout 0.001-in. from the wall in 40 strokes per cylinder under automatic cycle control, using four 400-grit stones (Norton 37-400-0). Photos by Birdsall

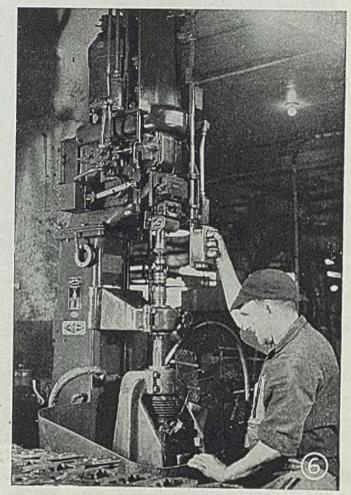
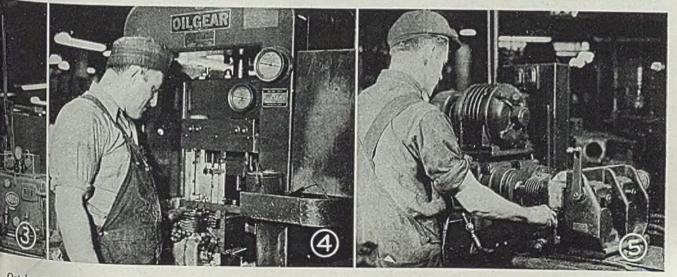


Fig. 4—Special Oilgear hydraulic unit broaches pressure relief grooves and presses in valve guides. At same time, setup is arranged to check the guides for tightness, light automatically indicating correct conditions. Next work goes to third 6-station Nateo where 58 tools work on top and magneto side; then to a fourth Natco for further drilling and tapping

Fig. 5—This Ex-Cell-O 2-spindle precision boring machine employs Carboloy single-tip type tools to finish the main cylinder bore to plus or minus 0.001-in. in preparation for honing. Two castings are handled simultaneously, removing about 0.018-in. on the diameter. Bore is 4½ in. long, requires only 50 sec. Tools work at 700 rpm



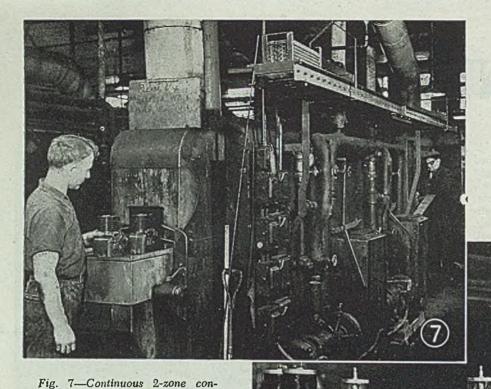


Fig. 8—Special machine taps 21 holes in each casting—4 on magneto side, 7 on top, 10 on bottom. High-speed steel taps, commercial ground, turn out 160 pieces per hour here

rig. 1—00mmatus 1 some conveyor type washing machine (Blikeslee-Niagara) first sprays castings with hot alkaline cleaning solution (at 210° F) and with live steam, from 50 nozzles. Second section employs 50 more nozzles to spray hot rinse. Castings now go to final inspection and on to assembly. This washing machire is also used for other work. Note roller conveyor section at right which is lowered and used for returning work beskets to loading end when handling small parts

tions (Figs. 1 and 2). First Natco, Fig. 2, drills and reams a large hole and a small hole in the ba e of the casting and these are used as locating holes in succeeding operations.

Four special Natco automatics are employed to work on different surfaces of the castings and to handle holes that may be too close together to work on the same machine. These special setups, two of which are pictured in Figs. 2 and 3, work on two castings simultaneou ly at

Atomic Bomb Required Extensive X-Ray Setup

At the Hanford, Washington, division of the atomic bomb development project, one of the largest x-ray inspection programs ever performed was required. Equipment was set up by Triplett & Barton Inc., Burbank, Calif., in a desert waste miles from supplies and with only construction camp accommodations and untrained labor on which to draw. It was necessary to design and manufacture special jigs, x-ray coolers, expansion tanks, power transformers, magnetic and contoured film holders and other devices. each station, the fixtures employing a single clamp for the two castings in Fig. 2 setup and individual clamps in the one in Fig. 3.

As soon as the operator has unloaded the two completed castings and reloaded at his station, he trips a control which causes the machine to index and go through its work cycle automatically at each station. Machines pictured have six stations—five working stations and a reloading station. Rejects from this line run surprising low, considering the amount of we that is done on each casting. Note single machine in Fig. 3 has a total 62 tools working the casting. Only 3 or cylinders per 100 will be scrapped at fully half of these will be classed foundry scrap. Inspection gage setu, are located at each work station at at an overall inspection station at en of the line.

Down time for maintenance is los

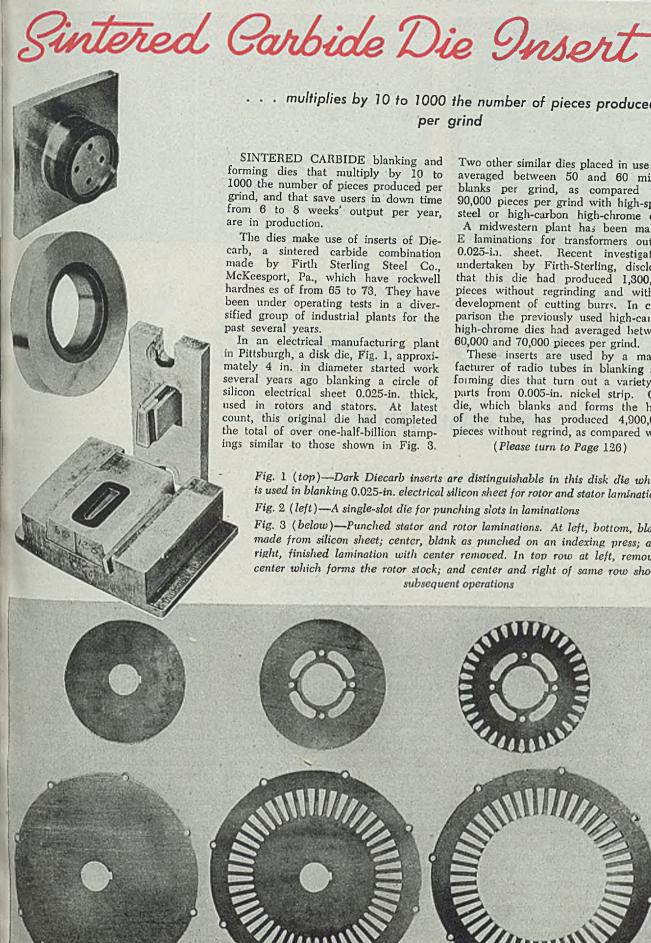
Also a new type of film was manufactured by DuPont Corp. for company's sole use. Plant operated 24 hr a day, x-raying thousands of lineal feet of welds.

Manual Describes Saw Operation

A technical manual entitled "How to Operate and Maintain the DeWalt Saw" offers informative data on use of radial power saws for all kinds of wood cutting operations; is available from DeWalt Products Corp., Fountain avenue, Lancaster, Pa. First part illustrates and explains the three radial saw movements and how they are easily masters. Instructions to set up include diagra of floor plan, attaching extension take and cutoff gages for dimension cuting together with dust collector hooky. Twen!y-four different operations utilize saw blades, dado heads, shaping cutier router bits, and other tools are present

Second section introduces and explain the simple mechanical adjustments the control and maintain accurate setting

Present owners of saws manufactured by the company are asked to forward with their requests the model designtion and serial numbers of machine and meter to help check and bring service records to date.



multiplies by 10 to 1000 the number of pieces produced per grind

SINTERED CARBIDE blanking and forming dies that multiply by 10 to 1000 the number of pieces produced per grind, and that save users in down time from 6 to 8 weeks' output per year, are in production.

The dies make use of inserts of Diecarb, a sintered carbide combination made by Firth Sterling Steel Co., McKeesport, Pa., which have rockwell hardnes es of from 65 to 73. They have been under operating tests in a diversified group of industrial plants for the past several years.

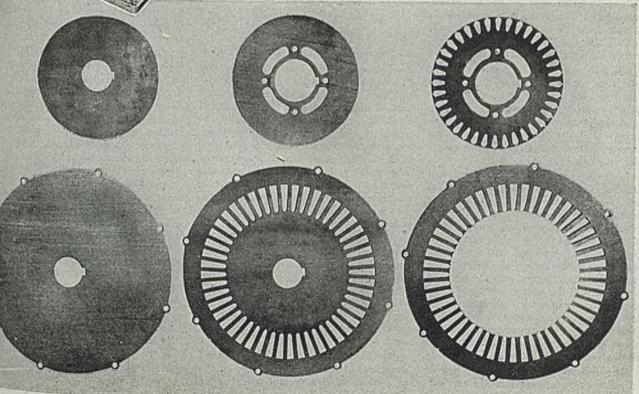
In an electrical manufacturing plant in Pittsburgh, a disk die, Fig. 1, approximately 4 in. in diameter started work several years ago blanking a circle of silicon electrical sheet 0.025-in. thick, used in rotors and stators. At latest count, this original die had completed the total of over one-half-billion stampings similar to those shown in Fig. 3.

Two other similar dies placed in use also averaged between 50 and 60 million blanks per grind, as compared with 90,000 pieces per grind with high-speed steel or high-carbon high-chrome dies. A midwestern plant has been making E laminations for transformers out of 0.025-in. sheet. Recent investigation, undertaken by Firth-Sterling, disclosed that this die had produced 1,300,000 pieces without regrinding and without development of cutting burrs. In comparison the previously used high-carbon high-chrome dies had averaged between 60,000 and 70,000 pieces per grind.

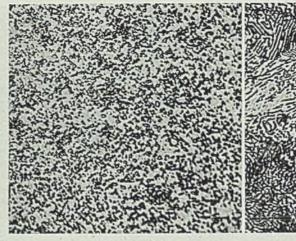
These inserts are used by a manufacturer of radio tubes in blanking and forming dies that turn out a variety of parts from 0.005-in. nickel strip. One die, which blanks and forms the base of the tube, has produced 4,900,000 pieces without regrind, as compared with (Please turn to Page 126)

Fig. 1 (top)-Dark Diecarb inserts are distinguishable in this disk die which is used in blanking 0.025-in. electrical silicon sheet for rotor and stator laminations Fig. 2 (left)—A single-slot die for punching slots in laminations

Fig. 3 (below)-Punched stator and rotor laminations. At left, bottom, blank made from silicon sheet; center, blank as punched on an indexing press; and right, finished lamination with center removed. In top row at left, removed center which forms the rotor stock; and center and right of same row shows subsequent operations







and obtain longer tool life

Practical suggestions are set forth on selection of tool steels, design and preparation of tools, design of the part, method of manufacture and previous treatment of the metal machined

BECAUSE of the fact that most tool steels use a relatively large amount of the critical alloys, the conservation of tools and tool steels is one of the highest importance. The usual high speed steels contain from 15 to 25 per cent of such critical alloys as tungsten, molybdenum, chromium, vanadium and cobalt.

The following are suggested ways in which longer tool life may be obtained and a smaller quantity of alloying materials required. Everyone in industry from the plant manager through the designers to the machine operators can do some part in conservation of such valuable material.

In the conservation of tools and tool materials, attention should not be centered only in the tools themselves, for while the design, composition, and method of use are all important, consideration of the material being cut can also be productive of material savings. This may include the design of the part, the method of manufacture, and the previous treatment of the metal machined. As regards the machining operations themselves, the proper design and proper tool steel properly used can save more critical alloys than any substitution in the alloy content of the tool steel.

The following methods have proved of value in prolonging tool life and cutting down the quantity of alloys required.

By ROBERT C. GIBBONS

How to Conserve Tool

Metallurgical Engineer Eclipse Pioneer Division Bendix Aviation Corp. Teterboro, N. J.

I-Control of the Material Being Cut:

A—Selection of the Proper Steel for the Finished Part. Too many engineers in designing a part neglect entirely the problems of manufacture and the difficulty of machining. Some steels, especially the free-machining grades, machine much more readily than others. An increase in the alloy content generally lowers the machinability, but this can be counteracted by additions such as sulphur or selenium which give free-machining qualities with but little loss in physical properties.

Where the application of the finished parts does not require high physical properties, the selection of materials such as Bessemer screw stock, SAE-1112 or other free machining steels such as SAE-1117, SAE-1137 and the free machining grades of stainless steels will increase the tool life of all machining tools used.

B—Control of Hardness and Microstructure. It has long been known that in a given steel a certain hardness and structure will machine much more easily than others. Careful control of the pur chased material as bar stock, forging or castings will permit the best result of tools used on the job. The particular structures and hardnesses depend of the type of steel in question and is to long a subject for this report.

Specific information can be obtained from various sources in the literature but in general a uniform structure will lamellar pearlite and ferrite is preferable for steels of below 0.45 per cent carbon content, and spheroidized structure for higher carbon steels gives best result on rough machining operations, especially on automatic machines.

Preferred hardness is generally about 180 to 210 brinell. In many cases the desired structure and hardness can b specified on the purchase order or her treated in the individual plant to give the most desirable ranges. Often it has been found much cheaper in the end t give the steel or partially fabricated part a special heat-treatment to put it in the most desirable condition, the extra co of the heat treatment being more that compensated by the reduction in cost of machining. Each job is a special problem in itself and should have the attention tion of the metallurgist, machine ship foreman and heat treater to specify the proper hardness, microstructure and treatment necessary to obtain it.

Once the material is started through the shop it is generally assumed that the structure and hardness is satisfactor for the first machining operation it we be satisfactory for all machining opertions. This is not always true as soft structure that works best in rough



machining operations is usually not the best for later operations that require a fine finish, and a special heat treatment is often advisable to change the structure and provide a slightly harder steel. C .-- Control of Surface. Forgings and castings generally have a heavy scale that should be removed before machining, as the scale is very abrasive and causes excessive wear on the edge of the tool. After most heat treating opentions, even in some cases when done in controlled atmosphere furnaces, a light scale remains on the surface and may seriously reduce tool life. Such scale may be removed by sand blasting, shot blasting, tumbling, pickling or Bullard-Dunn treatments.

D-Choice of Shape of Raw Material. Tool life is frequently calculated as the number of cubic inches of metal removed between grinds. On this basis the design which requires the smallest amount of metal to be machined gives the best tool life. While automatic machines are the favorite of many shops the importance of using forgings, castings and stampings to prefabricate a part must not be overlooked. Relatively less stock need be removed and less tool cost is the result. The lately revived "precision castings" eliminate much machining and is well worth considering for small, intricate parts.

E-Design of Assemblies. Redesign ef assemblies is often possible to permit less machining. The use of brazed assemblies, welded assemblies or press fit assemblies to make a given job out of two or more parts rather than one, will often permit a decrease on total machining of a unit. This is especially true if one of the assembled parts can be made by punch press operations. The recent

(Please turn to Page 150)

Fig. 1-National emergency steel NE-8740 forging with good structure for best machining. Mag. 750X. 3 per cent Nital etch

Fig. 2-Electric furnace steel SAE-3250 microstructures. The spheroidized structure shown at left permits faster machining on rough cuts but the finish is usually poor. The lamellar pearlitic structure shown at right is best for finishing cuts. Both samples etched in 3 per cent Nital, Mag. 750X

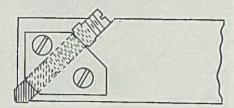
Fig. 3—Free-machining steel SAE-1117. The stringers are manganese sulphide which help to break up the chips. Mag. 100X. 3 per cent Nital etch

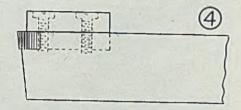
Fig. 4-Side and top view of tool holder used for carbide and cast tool bits instead of brazing tip to shank. Used on light cuts

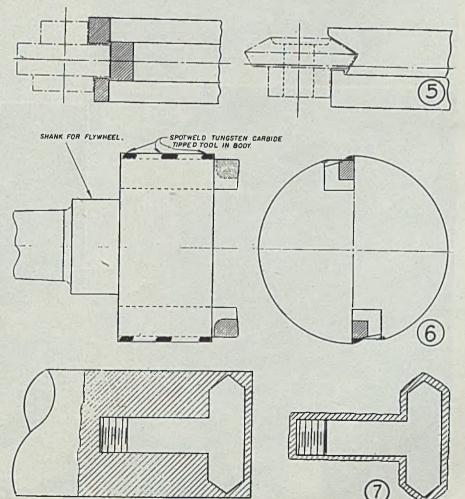
Fig. 5-(left) Form tool made in three parts with brazed tips of high speed tungsten carbide or cast tool steel. (right) Bevel gear form tool in two parts, high speed steel

Fig. 6 - Milling cutter with two tungsten carbide tool bits welded in body for teeth

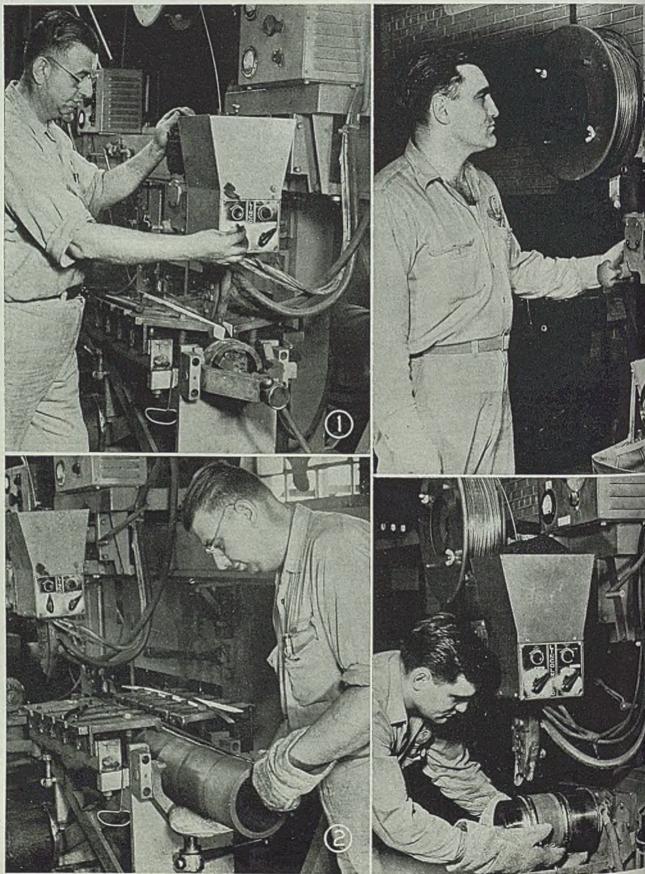
Fig. 7-(left) Bevel gear and shaft cut from bar stock. (right) Same bevel gear and shaft cut from forging, Cross-hatched areas show metal to be removed

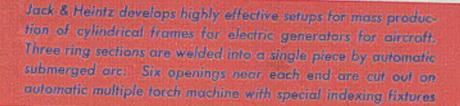






COMPOSITE GENERATO





By G. W. BIRDSALL Associate Editor, STEEL

DEVELOPMENT work never stops at Jack & Heintz Inc., Cleveland, as the search for improved manufacturing techniques goes on continuously. Result is that some exceptionally effective production setups have been worked out there that have not only increased output but cut overall costs as well.

Perhaps typical is the production of the generator frame or housing shown in the accompanying illustrations. The finished frame is a cylinder, open at one end and measuring approximately 6½ in. outside diameter through largest portion. Overall length is about 12 in. It is made from three pieces of material. The top end. closed except for an opening large enough for the bearing, is forged from SAE-4130 steel.

The opposite end is a 3¹/₂-in. length of SAE-4180 seamless tubing, 6¹/₂ in. outside diameter, ⁵/₈-in. wall thickness. It is cut to length on an 8-in. Cleveland automatic screw machine which also rough machines the outside and inside diameters and takes a square cut about ¹/₄-in. deep on the radius and ¹/₂-in. wide on the inside corner of the end facing the center section of the frame, thus forming the female member of the joint diagrammed in Fig. 8. This type of joint is utilized at the two circumferential welds joining the two end sections with the center section. It facilitates alignment of the parts and provides a shoulder that automatically "backs up" the weld.

The center section is made from Armco ingot iron to provide best electrical characteristics since that section forms part of the magnetic circuit, the field coils and poles being mounted inside the generator frame at that point. This is the reason why the entire housing is not made from a single piece of seamless tubing, with perhaps a bolted or welded bearing support at the top end.

The Armco iron arrives at the plant in the form of pickled bar stock, 5 in. wide and %-in. thick. It is cut into 21-in. lengths on a cold saw. Flat lengths are then rolled into a circle in three operations.

All raw materials are strictly controlled here. Each incoming shipment is held on outside receiving dock until two samples selected at random from shipment have been given mechanical and chemical tests and okayed.

After rolling, the two ends of the center section are milled to form a single-V slot for the butt weld. Top or open portion of Vee is on outside, of course. Vee is about ½-in. wide at top, ½-in. wide at bottom.

Longitudinal Butt Welding: Figs. 1 and 2 show setup for making the longitudinal butt welds on the Armco iron center sections. A multiple fixture holds five sections in line. In addition a 2-in. length of tubing is clamped in line at each end of the group to provide start and run-off spaces for the arc, assuring that only perfect weld metal placed under full automatic control will be deposited in the butt welds themselves.

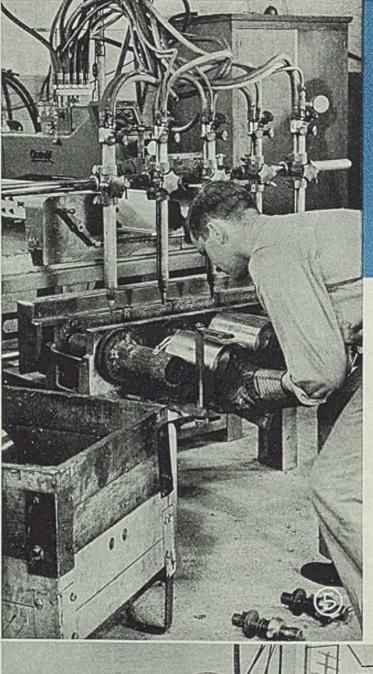
As seen in Fig. 2, the parts to be welded are slid into the fixture from the end where the vise-type screw clamp is hinged, allowing it to fall down to clear the fixture. Fig. 1 shows the parts in place with the vise-clamp holding them se-

Fig. 1—Antomatic submerged arc machine with fixture for welding five center sections by making one long longitudinal butt weld through all five. Sections are subsequently broken apart and ends machined. Lincolnweld machine, Jack & Heintz fixture

Fig. 2—Removing the five sections with the single longitudinal weld. Note how end clamp in Fig. 1 has here been released and lowered to permit removal of the ring sections. End clamp also holds internal copper-faced backup bar in position

Fig. 2—Setup for making circumferential welds between the three ring sections. Note fixture rotating mechanism at right. Automatic welding head does not change its position

Fig. 4—Removing completely welded generator frame. Arrow points to cylindrical wedge used in clamping the work endwise on fixture



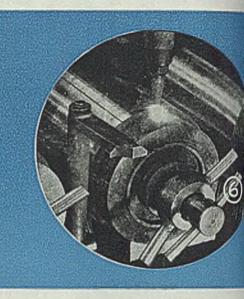


Fig. 5—Inserting rough-machined frames onto mult cutting fixture. Bayonet type locking plugs seen on f hold work secure against flanged back plate

Fig. 6—Closeup of torch starting first cut on top front section

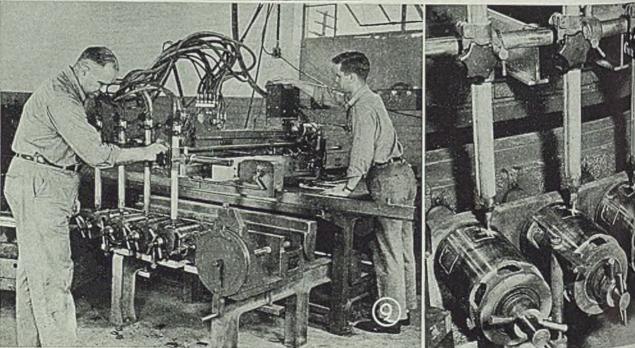
Fig. 7—Closeup of torch starting last cut on bottom rear section. Note pattern of cut just completed. To does not start cut on edge, but away from it as sho

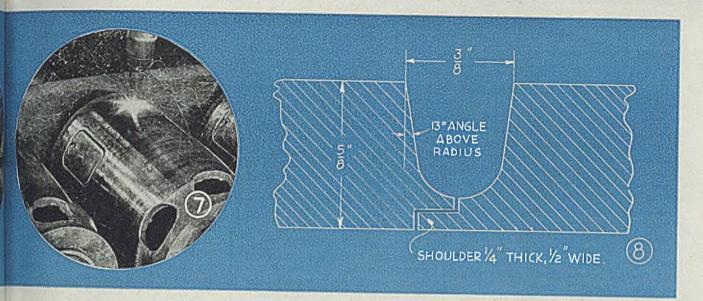
Fig. 8—Schematic diagram showing how the circl ferential joints are prepared for welding. Show automatically forms backing for the weld which the longitudinal weld is made in a single pass on Lincolnweld machines

Fig. 9—Oxweld cutting machine with Jack & He fixture. Indexing wheel is seen here at immedi foreground

Fig. 10—Overall view of multiple torch setup of pleting last cut on rear section

Fig. 11—Closeup view of the two templets and tracer head on the Linde machine





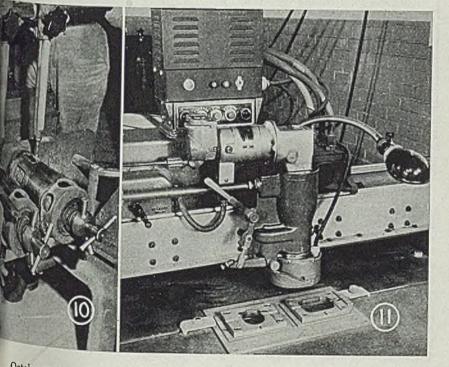
curely in position endwise. The five sections to be welded are held in position radially by means of five pairs of fingers operated by individual air cylinders to provide uniform holding action regardless of slight differences in outside diameter of the parts themselves. A locating bar aids in positioning the parts so the milled slots are lined up correctly. A single air valve operates the radial holding fingers.

The holding fingers press the parts against a heavy copper backup bar positioned inside the tubular sections opposite the weld. Strips of asbestos sheet are placed on top against the fingers to confine the granular fluxing material to the weld area. See Fig. 1.

The Lincolnweld submerged arc welding machine automatically feeds 7/32-in. diameter Lincoln Type E774 welding wire into the weld where a current of 700-800 amp forms an arc at 30-35 v under a covering of granular flux material automatically fed down by gravity from an overhead hopper. Machine welds at a rate of about 17 ipm some 4½ min and 14 ft of wire being consumed in making the five butt welds in line.

The automatic head, hopper, wire feed mechanism and controls are all mounted as a unit on a structure that rides horizontally on a substantial rail, as seen in Fig. 1. The same rail also carries two other heads further along which work at two other stations where the circumferential welding is done on similar setups pictured in Figs. 3 and 4.

Circumferential Welding: After the butt welds have been made, the center sections are broken apart and prepared for assembly to the end sections by rough machining outside diameter and cutting the flange at each end to form the male member of the joints as indicated in diagram Fig. 8. In making this flange, metal is removed from the outside corner at each end of the center section, thus trimming up the weld it-



self at each end where the bead was broken in separating the sections.

Length and outside diameter of this center section are held within plus or minus 0.010-in.; outside diameter must be a true circle within 0.010-in.

In positioning the three ring sections for the circumferential welds, the three parts are slipped over a drawbar, locating from bearing bore and end section holding the three parts in position radially. Flanges at the joints are close fitting to assure proper alignment. Parts are clamped endwise by an air cylinder that operates a draw bar extending through the three sections to the front.

The top or front end section of the assembly is centered on the draw bar and engaged lengthwise by means of a thick circular plate or cylindrical wedge, slotted to fit quickly over the draw bar and tapered to center the work. In Fig. 4 where the operator is removing a completely welded assembly, an arrow points to the wedge as it sets on the case covering the drive which rotates the fixture.

Preparation of joint edges is shown in diagram Fig. 8.

Circumferential welds are not quite so heavy as the butt welds so require only about 400 amp of welding current at about 26 v. Some 27 ft of ¹/₈-in. diameter wire are consumed in making each circumferential weld. Time per weld is 150-160 sec. Automatic welding head is identical with that making the butt welds. Two stations are provided for the circumferential welding since considerably more time is required per frame than in making the butt welds.

Melt material is fed down both ahead and behind the weld. The curvature of the work requires this double feed to assure proper coverage of the weld at all times. To confine the melt to the weld area as much as possible, an asbestos guard is slipped over the work. Braces and springs hold it securely in position as the work rotates. See Fig. 3. The guard has been removed in Fig. 4 to show the work better. At all welding stations, excess melt falls through a screen into a vacuum recovery system.

Fig. 4 also shows the air valve at

right for controlling the air operated fixture, and the variable speed control for adjusting the rate at which the fixture turns during welding. Speed usually employed is ½ rpm; that is, it takes 2 min to make a complete circumferential weld.

After first circumferential joint is made, entire fixture is slid lengthwise under the welding head for the second circumferential weld. The automatic head at this station continues to remain positioned exactly on a vertical line through center of the work.

Multiple Gas Cutting On Cylinders: Multiple torch cutting machines for producing outlines in flat plate are quite common. However, it is not so often that one sees multiple torch cutting setups working on cylindrical pieces such as these generator frames.

After circumferential welds are completed, a rough machining cut is taken on the outside diameter, and the inside diameter is bored and rough undercut. Then the work goes to the flame cutting setup pictured in Figs. 5, 6, 7, 9, 10 and 11. Here a multiple fixture holds five frames for simultaneous cutting. Six oval holes are cut in the top or front end and six rectangular holes at the other end of each generator frame.

When each hole is cut, the work is positioned on the fixture so that the center of the hole is on a vertical line that intersects the axis of the frame. Thus the walls of each hole are at a 60° angle with walls of adjoining holes.

Bayonet Positioning Plugs: The cylindrical frames are positioned radially on the fixtures by a shoulder on the back plate over which the open end of the frame fits snugly. See Fig. 5 where op-erator is loading the fixtures. In this illustration two of the bayonet springbacked locking plugs can be seen on the floor. These plugs fit into the core of the fixture, having a pin which engages a slot in the core to lock the plug in place endwise. Then the work is clamped against the back plate by means of a large nut with two spokes for hand manipulation. Turning this nut tightens a spring which pushes a plate against the end of the generator frame.

This spring provides the floating action required because the work gets quite hot during the cutting operation and expansion would break off the nut if it were screwed up solidly against the end of the generator frame.

Precision Indexing Provided: After one hole has been cut in each frame, all five fixtures are indexed to the next position by turning the hand indexing wheel seen in center foreground of Fig. 9. All five fixtures are connected to this index wheel through fully meshing gears which eliminate any backlash. The large hand indexing wheel is also geared down in a 2:1 ratio so that it makes two complete revolutions to one revolution of the work. Since the hole centers are spaced 60° radially from each other, the notches on the perimeter of the indexing plate are 120° apart.

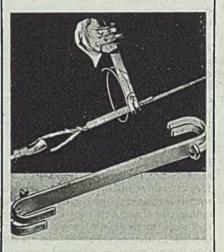
But sequence of hole cutting is to

cut one hole, then skip one and cut the next hole, and so on. Thus sequence of holes becomes 1, 3, 5, 2, 4, 6. This involves turning the indexing wheel 240° for each new cut. A tapered spring-backed locking wedge seen just above the indexing wheel in Fig. 9 fits into slots in edge of index wheel to securely hold each position as desired.

Since the holes must bear a certain relation to the butt joint in the center section, each fixture is served by a gage which is swung over the fixture to allow

New Mousing Tool

An additional method for deadending guy strand has been made po sible by the development of a mousing tool by Copperweld Steel Co., Glassport, Pa. This tool enables the lineman to place about 50 closely wrapped turns around the free end of the strand and the main strand, thus binding them



securely together. This type of dead-end will develop the full rated strength of the strand and is applicable for attaching the strand to the various guy fittings. It provides an alternate method to serving the individual wires of the strand and to dead-ending with guy clamps. The tool is provided with two small J hooks which maintain tension on mousing wire.

positioning the weld directly over axis of fixture before the frame is clamped in place. These gages can be seen in Figs. 5, 6, and 10.

Fixture cores are protected against slag, burned metal and the cutting flame itself by guards placed over the cores as shown in Fig. 5. These guards are made from scrap sheet metal and are easily replaced with new ones as it becomes necessary.

Automatic Shape Cutting: The Oxweld cutting machine is a standard unit supplied by The Linde Air Products Co., New York. As shown in the overall views, Figs. 5 and 9, it is furnished with a large bed for cutting shapes up to some $4 \ge 8$ ft. However, the entire cutting job here requires movement of the miltiple torches through a maximum distance of only 8-10 in.

The automatic follower mechanism shown in the closeup, Fig. 11. He also are the two guide templets or paterns for the two cuts—the circular or for the front row of holes, the square or for the back row. The head inclumagnetic follower element that engage the inside wall of the templet path causing the multiple head carrying the torches to travel back and forth ar lengthwise as the small rotating for lower element rolls around the we of the templet. Pushbutton contro on the head enable the follower to run in either direction or stopped at wi

Method of operation is to make a the holes in the front row first, indexin the rotatable fixture till the complerow is finished. Then the follower her is shifted to engage the back templand the back row of holes cut in a sin ilar manner, following the same so quence of hole numbers (1, 3, 5, 2, 4, in order to prevent distortion from her buildup that would occur if consecutiv holes were cut.

In making any hole, the cut is a started exactly on the edge of the bol but back a short distance from the in of the finished cut. This pattern ca be seen readily in the cut section show in the closeup, Fig. 7.

Cas for the oxyacetylene cuttin torches is obtained from a bank cylinders, assuring a continuous supply

Accuracy Of Cut Is High: Cutting tips shoot forth a jet of gas that cut a narrow path through the metal, usu cut here being about 1/32-in. with Edge of flame cut holes is comparative smooth. Dimensions of holes are accurate to plus or minus 1/64-in.

Finishing operation starts with burns the holes to knock off any slag that my form rough spots at the edges of the flame cut holes. This is done with hand grinder.

Heat treatment is done in batch by gas-fired furnaces, 50 frames at a tim heing heated to 1575°F for about 1 hr, quenched in oil and drawn 1 1050°F. This gives a hardness of 28rockwell C, the tendency being to kee to the low side to as ure good machiability. Every frame is given a rockutest, two or three points being checkat each end. Frames are sand black after heat treat.

Finish machining starts on a lar-Midland which first machines the outsi diameter, finishes the band on the ors'de diameter at the bottom end, iar bottom end, and centers the pieceabove being done in a single setup at ra of 70 per 10-hr day, using carbide too

Frames then are put on an expander arbor, bottom face sparked out and a side diameter ground to minus 0.00 plus zero to provide a locating surface for remainder of finishing operation After finish machining, critical surface are covered and unit is sand blasted to burr off all holes, etc. Parts then go a to assembly.

- A soldier on a troopship ... A secretary on a factory-floor ...
- A secretary on a factory floor ...
- A foreman on a refinery tower . . .
- An oiler on a locomotive deck . . .

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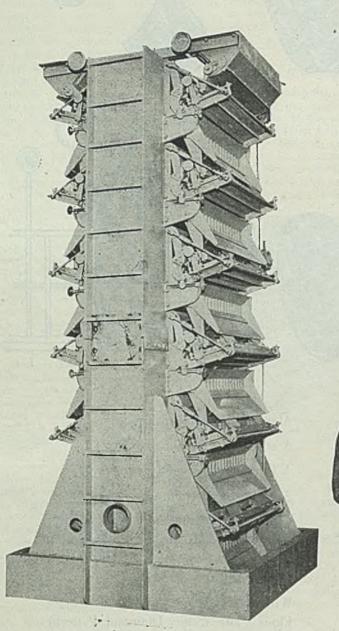
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Cleveland



This well-known method of segregating materials is finding many new uses in industry



By R. H. STEARNS President Stearns Magnetic Mfg. Co. Milwaukee

INDUSTRY today would be seriously handicapped if were not for the advantages that magnetic separation of Experience, engineering skill, and expert supervision, as as a rescarch laboratory are required to meet the new a varied demands of industry.

Magnetic separation may properly be considered necess today under four important, yet separate and distinct da fications as follows: (1) Purification, (2) Protection, (3) a covery and (4) Segregation.

In considering the four classifications, the first suggests need for separation in many important fields of industry. If example, breakfast foods become contaminated with rust so or iron oxide while in the process of conversion from raw meterials to finished products. Other foreign materials such stick pins, hair pins, pieces of wire, small screws, nuts a bolts which work loose from the processing machinery, or fin the clothes of the operators, must be removed by me netic separation. Even salt used for seasoning of butter a cheese, today is cleansed and purified, before use, by the process of magnetic separation.

> The second classification, protection applies properly to industries where reterials are handled and processed various uses in large capacities, such coal, rock, ore, etc. Such materials usually handled by belt conveyors a delivered to crushers, grinders and reverizers where the material is reduce to the required sizing. Tramp iron in form of mule shoes from the mines, re-

Fig. 1 (left)—For treating "reluctant" mater or in solving difficult magnetic separation prolems, a separator of the gravity or deflector w shown here works well in obtaining higher covery and a sharper division of values, such in segregating minerals and ores

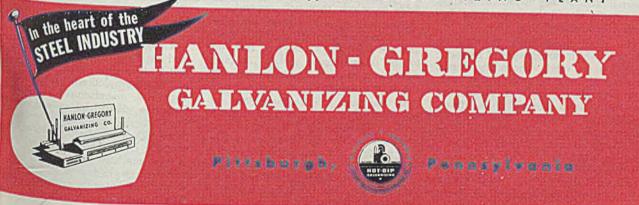
Fig. 2 (below)—In the mining field, this the of separator is used for high concentration where several different mineral or ore values involved

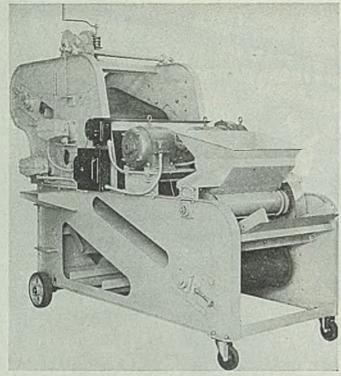


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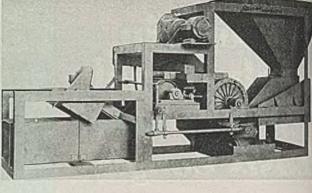


Fig. 3 (left)—This separator contains two magnetic pulleys is used for the large-capacity segregation of nonferrous f ferrous materials

Fig. 4 (above)—This magnetic separator automatically was and cleans material from tumbling barrels

road iron such as spikes, coupling pins, and broken parts of machinery find their way in such materials and if not removed by magnetic separation result in damage, breakdown and delays in production before repairs can be made.

Many types of magnetic separators are used for this service. The type most generally applied is the magnetic pulley which replaces the head pulley in the conveyor system. Other magnetic separators used for this purpose are the suspended and spout types.

There are many other forms of protection where magnetic separation plays a very important part in industry. Explosions and fires, for example, which usually result in loss of life and property damage, as well as serious delays in necessary manufactured products, may be the result of a spark from tramp iron coming in contact with operating process machinery. The brewery, the feed mill, powder mill and chemical plant, are a few places where such hazards exist. There are so-called standard mag-netic separators which solve many of such problems. On the other hand, there are many problems in this class which must be given special attention through research and testing before a solution can be offered and the proper type separator recommended.

The third classification, recovery, is a field in which varied types of magnetic separators are used. Secondary metals, for example, must be processed by magnetic separation to recover the nonferrous metals from iron and steel. Brass, bronze, and aluminum chips and also scrap metals are processed in this manner, usually on drum and magnetic pulley type separators.

Other worthwhile recoveries are made from iron foundry refuse formerly considered as waste and carted to the dump. Such waste is now treated for iron recovery by magnetic separation. The drum type or magnetic pulley separator is, in most instances, the most practical for such service.

The fourth classification, segregation, applies principally to ores and minerals, especially to the latter of which there are many varied complexities. Magnetic separators or ore concentrators are classified in the following categories: The lift method, the induction method and the deflection method, all of which are by the dry process. There are also several forms or processes wherein the wet treatment is best applied.

Several Fields of Separation

Ores and minerals in most instances are made up of many values which invariably are of a reluctant, variable magnetic nature, and, therefore, require magnetic separators having more than the usual single field of separation—sometimes as many as nine of such fields in a single machine. Each of such fields is made increasingly stronger and subject to variable mechanical adjustment and electrical regulations so that the values which usually vary in magnetic permeability can be recovered or segregated from each other as they move into the fields to which they will respond.

Sometimes several magnetic separators or ore concentrators are used in a series and the minerals or ores pass from one to the other thereby making as many separations as are required to segregate the several values.

In the past half century closer attention has been given to magnet design and manufacture, and the demand for separation equipment has grown to meet the needs which today make possible the broader use of materials in industry which were formerly considered waste or valueless. For example, silica sands containing impurities, such as oxides, biotite, garnet and other similar in bearing compounds are now treated magnetic separation and the sands p fied to a grade which permits their for the finest of table and other glasswa The ceramic industry employs both and dry magnetic separation to impuand make possible a ware of the finest grade.

The chemical industry applies metic separation to a very consideral advantage for eliminating detriment impurities, as well as to provide proprotection for crushing grinding and proverizing process equipment.

There are manufactured today manufactured today manufactured today manufactured today manufactured provide the necessary protect and other service required, such as manufactured, magnets, cricular and rectangular limmagnets, magnetic clutches, combinate clutch-brakes, magnetic brakes, hold magnets for welding and other purper In fact, a magnet or magnetic device special magnetic separator can be splied to meet any and all problems we such device can be made useful or piled to a definite problem.

Heat Treated Steel

A new heat treated steel, with gun teed tensile strength of 125,000 ps better, is readily machinable, and uniform cross-sectional hardness. En Type A-2, manufactured by Horace Potts Co., Philadelphia, is intended be applicable for stressed or wer parts with unequal cross sections. In used for crank shafts, gears, and me laneous machine parts. Proper harder and strength are assured by the comp no matter what wear or stresses derely on the teeth.

/TEE

Adaptability

Adaptability

Adaptability



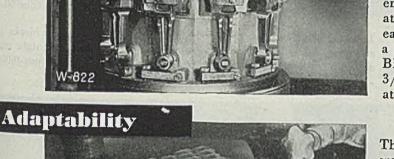
This picture clearly demonstrates the adaptability of the Blanchard. Here are a variety of pieces of cast iron, steel, and bronze ready to be ground on the No. 18 Blanchard Surface Grinder. Most of the pieces are to be ground on two sides, the usual limits being $\pm .0005^{"}$ and the amount of stock removed from .015" to .020" per surface.

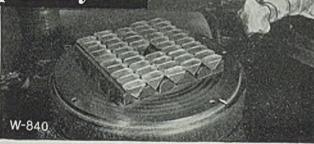
BLANCHARD

In adapting this work to the grinder, a Blanchard designed fixture holds ten pieces on the chuck at one time. These housing poles for magnetos have .140" stock to remove from steel laminations, and 30 pieces are finished per hour. This job also demonstrates Blanchard's ability to carry through from roughing to finishing operation.

This is an excellent example of increased production through adaptability. Formerly these master rods for an 1830 H.P. radial engine were milled and finish-ground one at a time at the rate of 15 to 20 minutes each. Now they are ground 10 at a time in a Blanchard special fixture on the No. 18 Blanchard Surface Grinder, which removes 3/8" of metal and turns them out finished at the rate of four minutes each.

The versatility of a Blanchard Grinder is well demonstrated in the adaptability of Blanchard No. 11 Surface Grinder. The illustration directly opposite shows a special fixture load of 48 glass prisms ready for grinding the hypotenuse. The "V" block fixture is held magnetically on the chuck. Grinding time is less than 3 minutes and stock removal .085".







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Sendzimir Mill

Employs Caster Backing Principle

ADDITIONAL details of a precision cold strip mill embodying new and to some degree radical principles in the reduction of steel, aluminum, copper and their alloys, for which much is claimed and proven in production, were disclosed at the final fall regional meeting, Association of Iron and Steel Engineers, Philadelphia, Oct. 6. T. Sendzimir, vice president, Armzen Co., Middletown, O., designer of a cold strip mill, first of which in this country is operating at American Rolling Mill Co., revealed basic features. The equipment is called the Sendzimir mill.

This mill has no backing rolls, utilizes work rolls of smaller diameters, has deflection compensating features and in design, due to smaller enclosed heat-treated and ground parts, has slight resemblance to conventional equipment.

Adjustable backing elements utilizing a caster bed principle, fundamentally employed on a punch or drill press in mak-ing holes in boiler plate, is basically applied to cold reduction of strip. Casters are mounted on a shaft, supported on a series of spaced spots on the same plane. Between are gaps which permit space for attachment of supports, or saddles, permitting precision adjustment of the mill.

The Sendzimir mill is being constructed by Waterbury-Farrel Foundry & MaWork rolls 21/2 inches diameter are employed for rolling strip 50 inches wide. No backup rolls are involved. Mill is compensated for deflection. Strip free from camber. Ten mills of this type soon to be operating in this country. Lubricating system maintains rolls at uniform temperature

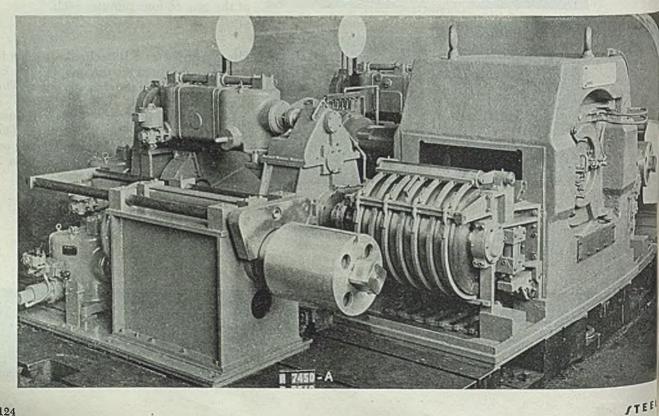
chine Co., Waterbury, Conn. Indications are about 10 units will be in operation in this country within the next few months. These will be somewhat smaller than six operating in Europe, several of the latter being 50-in. units.

Sendzimir mill employs no backing rolls. Basically the unit consists of one solid steel housing comprising the upper and lower beams which give support to spaced casters, which are connected with solid vertical columns. Depending on rolling conditions, a Sendzimir mill has two, three, four or more caster shafts per work roll and may use one or more sets of intermediate rolls, between the casters and work rolls. Although larger in diameter than the work rolls, these intermediate rolls are not backing rolls in any sense. They simply transmit the roll pressure, inch by inch from the w rolls, on to the casters, always in a plan perpendicular to the work rolls.

With the caster backing principle mill can use small work rolls even relatively wide strip. The roll diame does not depend on the length of strip. Mills for a 50-in. wide strip w 214-in, diameter work rolls are in ope tion; one is under construction with I in. diameter work rolls, for making in. strip. For foil gages of hard all still smaller diameter rolls are possi Since rolls are small, caster diamet

are also relatively narrow, the hous also being compact. Distance between the roll-bite, where the roll separat force is generated to the nearest spot the beam of the housing where it is ally taken up, approximates 20 in., sli

This view of a Sendzimir mill for 25-in. wide strip shows winder blocks, guides, and other details. Crown adjusting apparatus (not shown) is at right rear. For accuracy in parallelizing bearing surfaces to within plus or minus 0.0001-in, ground jigs and Johansen gage blocks are used



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PRACTICE SAFETY

The photographs show the production of parts for car-hauling trailers. Front and back stops make it easy to produce the several bends in each plate accurately and quickly.

This Steelweld handles $12^{\circ} \times 36^{\circ\circ}$ steel plates between housings and $14^{\circ} \times \frac{1}{16}^{\circ\circ}$ over entire length of bed and ram.

For six years a Model K5-12 Steelweld Press has been in continuous operation at the Whitehead & Kales Co., River Rouge, Mich., for nearly every type of forming operation in steel plate.

Much of the work is on plate ³/₈-inch thick and heavier. Bolt holes and larger holes are frequently punched. Recently oval-shaped holes approximately 5 x 7-inch were punched in ¼-inch plate. Hundreds of special conduit boxes made of 14 gauge steel have been produced to tolerance limits of .005 inch.

New ways of using the machine are continually developed as problems arise. It has proven to be one of the most generally useful all-around tools to The Whitehead & Kales Co., who specialize in automobile-hauling trailers and other structural work.



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compared with tall housings of a 4-high mill. Consequently housing can be made more rigid; total deflection is usually 0.0003 to 0.0007-in. After stretch in the two columns, center of the mill deflects a mere 0.0001 to 0.0002-in., rather more in the center than toward the edges of the strip.

Caster backing principle permits a means of compensating even this small difference in deflection by introducing into the backing system another elastic element with inverse deflection characteristics, i.e., having the highest deflection opposite center of the strip and smallest deflection opposite edges.' This is an important feature.

Side deflection of the outlying caster shafts is controlled; slots are provided in the housing to render independent that portion of the beam which is subject to side deflection. The mill, thus compensated for deflection, improves in accuracy, but another advantage is that heavy passes can be alternated with light ones with no effect on flatness or rolling characteristics. A heavy reduction pass can be followed by a light sizing pass and the strip is not damaged or distorted.

All rolls and casters on the Sendzimir are not necessarily strictly cylindrical. Casters are each crowned or have slight reliefs at edges without which they would cut the intermediate rolls. Small rolls and all backing elements are contained within a relatively small cavity in a rigid solid steel housing, a heavy ringlike structure with slots for the passage of strip.

Cylindrical Bores Enclosed

Enclosed are cylindrical bores for spaced supports of individual caster shafts machined to gage precision, parallel to within 0.00015-in. Same accuracy is achieved in larger housing mills for rolling of rather wide strip. Thus the foundation is established for ultimate mill accuracy. All small mill parts are heattreated and ground to close tolerances. Also spaced supports are individually ground to close limits, insuring strict parallelism of all rolls. Pressures carried are small compared with most conventional mills, contributing to higher speeds and heavier reductions.

Lubrication system surrounds all small sections with a circulating bath. Lubricant is uniformly delivered under pressure to each of the spaced backing casters, escaping into the general oil bath within the mill cavity, maintaining rolls at uniform temperature. Oil is filtered, cooled and recirculated.

On most 4-high mills, the last roll support is the bearing chock of the backing roll. Corresponding parts on a Sendzimir mill are inner races of roller bearings within individual casters. Parallelism is assured as they are slipped over caster shafts and are in turn supported accurately at close intervals by "saddles" seated in the machine bores within the cavity. Saddles are ground inside and out for precision and thus all caster shafts are parallel.

Elements permitting easy control of minor differences are these spaced saddles. There are usually six, eight or more caster shafts in a mill, but only one, in some cases two, have to be adjusted for purpose of crown control. Shaft saddles are provided with eccentric bores that carry the caster shaft. These eccentric saddles have a mechanism by which they can be individually released and rotated at limited angles, not over 3 or 4 degrees. Saddles may then be fastened in the new position.

Effective height of support at this spot is raised or lowered in a new position and more or less pressure is placed on the two casters adjacent to that saddle. Any crown effect is quickly and easily obtained since the entire width of strip is subdivided into spaces between these supports.

Small Diameter Work Rolls

Unique design of this mill makes possible effective use of work rolls in considerably smaller diameters for a given width. Work rolls when they flatten at the contact area with strip are too large if materially diminishing the reducing power of the mill, and since flattening depends on roll separating force, a certain diameter of roll may be acceptable for some soft metals, but too large for harder materials.

Small work rolls reduce the pressure area between roll and strip; also the bite angle is increased. This means that the total pressure a mill has to take is considerably smaller than mills operating with large-diameter work rolls. The mill itself and its bearings and other parts can be constructed much lighter. Nature of frictional contact between rolls and strip is also changed by the larger bite angle.

With small rolls, average angle of roll bite is more open and tension is more effective in further reducing the roll separating force. Roll bite being relatively short length over which slippage occurs is much less, lowering the heat generated by friction and reducing wear on rolls.

Relative lightness of frictional contact between roll and strip also has marked effect on tension in the strip, especially front tension contributing in production of flat strip. Deviation from flatness immediately translates itself into minor differences in tension, across the strip. These are compensated for by slight adjustments with bite of rolls, making it relatively easy to produce flat strip even in finer gages.

Freedom from camber is another result. Also with these small rolls is improvement in the edge of strip. Conditions at the edge do not vary greatly from remainder of the roll bite. Width of the edge zone is in most cases but twice or three times thickness of the metal and even those sensitive in this respect can be rolled with smooth edges that need no trimming.

Reduction of wide strip of relatively hard steel and alloys down to foil gages is done by this mill, to 60-in. widths, low carbon to high tensile alloys. Stainless and Monel down to 0.0005×24 -in. can be reduced on a suitably designed unit with this caster backing principle. Accuracy of 0.0001 to 0.0003-in. tolerance, depending on gage and metal also claimed; strip can be entirely palel with edge tapers less than 3/16wide. Strip is free from camber and a row widths can be economically produced by slitting in addition to operating straight on winders, there being no tedency to produce camber after slitted As a reversing mill for tin plate strahigh production type of work is class passes can be saved and schedules revised.

Heaviest reductions are the last or and power demand is rather unifor High speeds, coupled with heavy redutions, are apparent advantages with heat distortion of working element These considerations apply even no strongly when material is heavy. Se eral mills abroad are reducing long shee produced on 3-high mills, pickled ze welded into strips. These are 3/162 and are reduced to usual tin plate gage the last pass being between 30 and a per cent.

An annealed strip of medium gage i certain metals has been reduced 70 85 per cent in a single pass, the result strip being flat, smooth and accura Some steels, aluminum, copper and oth alloys are being reduced similarly, 0.020 to 0.003-in. aluminum alloy; fro 0.013 to 0.003-in. alloy steels; and 0.00 to 0.002-in. high-carbon steel.

(Editor's Note: Characteristics, rangement of roll backing elements, eco omies and application of the Sender mill were presented in the Nov. 30, 1s issue of STEEL.)

Carbon Die Insert

(Concluded from Page 111) an average of 20,000 to 30,000 p^{ise} achieved with alloy steel dies.

Another application has been to of a fabricator for punching to armor plate.

William C. Uecker, chief engines the company's Diecarb Division, str that a number of die-makers also he co-operated in experimenting with tered carbide inserts, and applicate are now in existence where the mateto be stamped includes paper as as most of the common metals.

The fundamental advantage of the serts, according to Mr. Uecker, lies the vast increase in number of blanc or formings per grind, which suboth down-time and maintenance. As burring, distortion, dimpling, buckand chipping or breaking, even in a of mis-cuts, are reduced.

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/ TEE

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CURRENT



PRACTICE

Third article in series presents fundamental chemistry of cyanide type zinc baths; and data on the zinc-mercury process and "bright" zinc plating

CYANIDE zinc plating baths possess several inherent advantages over the acid batus, specifically high throwing power with good covering power at low current desities, and more recently the capacity for production of truly "bright" deposits which make them applicable to plating of finished articles. 'The most important recent line of development in cyanide tine baths has been the introduction of several "bright" plating processes that give deposits ranging from a bright luster to a brilliant surface resembling chromium. This development has resulted in new applications for cyanide zinc plating in which good appearance is combined with excellent rust protective qualities.

It is expected that cyanide zinc plating will continue to expand in the future as the advantages of the cyanide bath are more fully appreciated. Cyanide baths use now used to a limited extent for conthrows strip plating^{*2} and it is believed that this use will continue to grow. "Bight" zinc plating exclusively from spanide baths has filled an important industrial need as a companion process to "bright" cadmium plating, which due in put to war time metal shortages it has replaced in some instances to good ad-Tantage. Many more metal parts are now plated in zine cyanide type baths than ever before and the rust protective value of the combined with the added excelert appearance of "bright" zinc offer an electoplated finish of wide application.

Fundamental Chemistry of Cyanide Type Zinc Baths

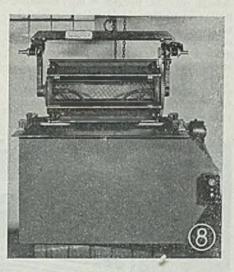
C. H. Proctor" was among the first to recommend cyanide zinc baths and to

Fig. 8—One type of cyanide zinc barrel plating machine with cylider, superstructure, tank motor. reducer and electrical conidions. (Courtesy Udylite Corp., Detroit)

tig 9-Typical pretreatment section for burrel cyanide zinc plating. slowing cleaner, pickle, rinse and terup for loading plating barrel. (Courtesy Lasalco Inc., St. Louis)

BY DR. ALLEN G. GRAY E. L. du Pont de Nemours & Co. Inc. Cleveland

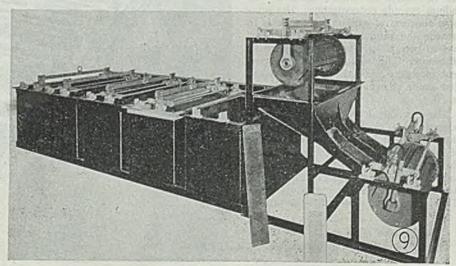
give compositions for specific uses. Probably the first authoritative investigation of cyanide zinc baths was that of Blum, Liscomb and Carson³⁴ of the Bureau of Standards who developed the pertinent fundamental chemistry and made definite recommendations with respect to bath composition and operating conditions. Their bath remains one of the best from

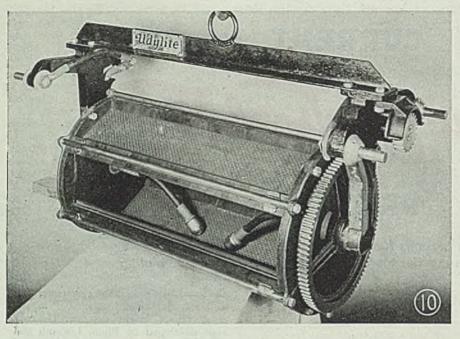


the standpoint of operating characteristics although not readily amenable to the production of "bright" deposits. The concept developed by Blum, Liscomb and Carson³⁴ (also see Blum and Hogaboom¹⁴) was that since from cyanide solutions zinc can be deposited satisfactorily only from a mixture of sodium zuscate and sodium zinc cyanide with an excess of sodium hydroxide or sodium cyanide, or both, all of the following components may be considered present in such solutions: Sodium zinc cyanide (Na,Zn(C-N),), sodium zincate (Na.ZnO.), sodium cyanide, sodium hydroxide and more or less sodium carbonate resulting from cyanide decomposition. It is evident from the above that the cyanide zinc plating solution is complex since the various solution components are in equilibrium with one another and the states of equilibrium are dependent upon the respective concentration of these components. The following chemical equations show these states of equilibrium:

- (1) Na Zn(CN) + 4NaOH \implies Na ZnO + 4NaCN + 2H₂O (2) Na ZnO $\implies 2Na^{+} + ZnO =$ ZnO₃ = + 2H₂O $\implies 2Na^{+} + 4(OH)^{-}$ (3) Na₂Zn(CN) $\implies 2Na^{+} + Zn(CN) =$ Zn(CN)₄ = $\implies Zn^{++} + 4(CN)^{-}$

While few fundamental studies have been made of the equilibrium involved in cyanide zinc plating baths it is, however, possible empirically to control solu-





tion constituents for which chemical analysis can be made with sufficient accuracy to insure continuously satisfactory bath operation. The composition of the solution is controlled by specifying a definite range of concentration for sodium hydroxide together with a prescribed range of the arbitrary ratio *M* of total sodium cyanide to zinc metal, where the total sodium cyanide equals the sodium cyanide plus the sodium cyanide equivalent of zinc cyanide. It has been found that all zinc cyanide plating baths, especially the bright baths can best be controlled using this representation³⁵.

It is essential for all three primary constituents, namely, zinc, sodium cyanide, and sodium hydroxide to be present in solution to produce good quality deposits at high cathode efficiency. The functions of the sodium cyanide are:

- 1-To combine with zinc compounds to form soluble complexes and
- 2—To provide a control medium for appearance of deposits.

Careful regulation of the sodium cyanide content is necessary to combine good quality deposits with high current efficiency, since the current efficiency of the electrolyte is closely related to the sodium cyanide concentration. The principal function of sodium hydroxide is to provide the primary source of zinc-ions and to permit operation at high current efficiency. The sodium hydroxide content increases or decreases to the extent that anode or cathode efficiencies are not equal.

The zinc metal concentration must be controlled in cyanide zinc baths, since this factor not only establishes the rate of deposition and current efficiency, but the two complexes that zinc forms determine the concentration of the cyanide and hydroxide components of the bath. Thus, it has been shown that the ratio M

Fig. 11—An eight station multiple barrel plating shop. (Courtesy Lasalco Inc.) of total sodium cyanide to zinc is of greater significance than the actual zinc metal content, assuming the customary sodium hydroxide limits of concentration. Thus it becomes apparent that cyanide zinc baths can best be controlled by maintaining a definite range of sodium hydroxide concentration which is not critical within that range, together with a definite ratio *M*. Because a high concentration of sodium hydroxide is essential to good cathode efficiency no other salts need be added to improve bath conductivity or to buffer the solution with respect to pH changes.

Cyanide type zinc plating baths at present in successful use may be divided into four general classes: (1) The conventional straight cyanide bath, (2) straight Fig. 10 — Details of the cylinder and superstructure assembly of the machine shown in Fig. 8

cyanide baths, for the production of du tile deposits, (3) the zinc-mercury proess, (4) the "bright" zinc processes.

The Conventional Straight Cyanide Zine Bath

Given below are two formulas that: extensively used in zinc plating from t straight cyanide type bath³⁶:

No. I		1.5
	Conce	entrati
Constituent	g./l.	OZ D
Zine Cyanide	60	8
Sodium Cyanide	23	3
Sodium Hydroxide	53	1

Operating Conditions

 Temperature
 40-50°C (104-158°)

 Current Density
 10-20 amp/aj

 Cathode Efficiency
 90-8

 Ratio M maintained
 2.0 ta

No. II (For Higher Current Density)

 Zinc Cyanide
 90
 12

 Sodium Cyanide
 37.5
 5

 Sodium Hydroxide
 90
 12

Operating Conditions

 Temperature
 40-70°C (104-158°

 Current Density
 .55-110 Å

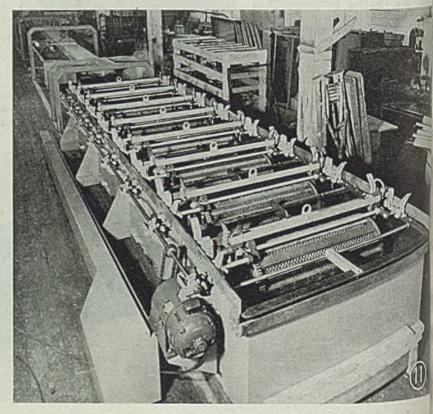
 Cathode Efficiency
 85-40

 Ratio M maintained
 .2.2 minimized

If bath operation is expected at here is a single second density ranges, solution constitutes should be maintained within 10 per resolution of the amounts given.

Straight Cyanide Bath for Production Ductile Deposits

The following bath formula has be



A	N	A	L	Y	S	I	S	

EED

TEEL

Carbon			.8085
Chromium .			3.90-4.40
Tungsten			6.00-6.75
Molybdenum			4.75-5.25
Vanadium			1.75-2.05

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Disston 6N6(M2) type High Speed Tool Steel was developed to combine extra toughness and wearing qualities with ease and certainty of heat treatment. It is a result of extensive laboratory work and long testing, including a twoyear run in the cutting chisels used in making Disston Files, one of the severest jobs a tool steel has to do.

Results showed that in most high speed applications Disston 6N6(M2) type is equal to the best 18-4-1 steel for toughness, wear and high cutting efficiency. This has been confirmed by customers who cooperated in the testing.

There are no finer steels than Disston Steels. All are sound, clean, uniform-thoroughly dependable in every way—and represent the latest developments in metallurgy and engineering. Each is made in accordance with our special steel practice . . . in electric furnaces . . . of carefully selected materials . . . with every process under rigid control.

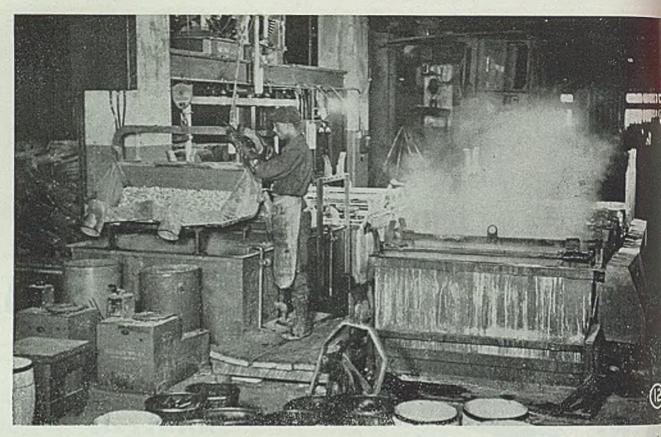
SEND YOUR TOOL STEEL PROBLEMS TO DISSTON ENGINEERS

Whatever your tool steel requirements, there is a Disston Steel that will assure maximum efficiency and

economy. Put your tool steel problems up to Disston engineers. They will gladly advise you, without obligation, as to the particular steel that will best suit your needs.



HENRY DISSTON & SONS, INC., 1026 Tacony, Philadelphia 35, Pa., U. S. A.



given for straight cyanide with deposits possessing extreme ductility^{s1}:

	Concentration		
Constituent	g./l.	oz gal	
Zine Cyanide	90	12	
Sodium Cyanide	37.5	5	
Sodium Hydroxide	82,5	13	
Sodium Sulfide	0.75	0.1	

Temperature Current Density . 90-95% Current Efficiency

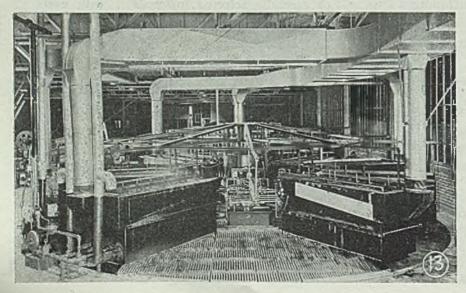
In operation solution circulation of cathode rod agitation is highly desirable to insure high efficiency at reasonable high cathode current densities. Higher temperatures may be used with correspondingly higher current densities. However, at higher temperatures cyanide decomposition is greater and throwing power is not as good; at lower temperatures lower cathode current densities must be used. Very soft ductile deposits are produced Fig. 12-Zinc plated screws and bolts coming out of final hot water rinse and going into centrifugal dryer prior to packaging. (Courtesy Lasalco Inc.)

which can be deep drawn or bent without cracking or chipping of the deposit even with relatively heavy coatings. The deposits are matt white in appearance.

The Zinc-Mercury Process

The zinc-mercury process³⁵ operates on the principle of production of a zincmercury alloy deposit which is smooth, white and in general somewhat more pleasing in appearance than the straight cyanide bath deposits. In 2-column table at top of p. 134 is a recommended formula for operation of this type solution³⁹.

When properly operated the zinc-mercury cyanide bath contains from 0.1 to 0.2 g./l. of mercury cyanide. The anodes used in the process contain from 0.5-



1.0 per cent mercury. During shutdow most of the mercury in the solution posits on the anodes by displacem reaction making it necessary to replen the mercury in the bath before operation is resumed. As in the case of the of cyanide baths discussed, all constitue of the bath should be maintained with 10 per cent of the recommended typ

The "Bright" Zinc Process

The several "bright" zinc processes the subject of numerous patents com ing addition agents, purifying agents a alloy anodes. However, in general t fundamental bath compositions are proximately the same and fall with concentration ranges given in secu 2-column table on p. 134.

The operation of "bright" zinc plat baths depends in a large part on the of commercially available materials, 18 ally patented, as addition agents while are effective in one or more of the full ing ways: (1) Brightening effect up deposits; (2) improvement in coven power at low current density, particula for barrel plating; (3) lowering of current density limit at which bright d posits are produced, thereby permit a low ratio of M and increasing the thode efficiency; and (4) permitting

Fig. 13 - Rotary type fully automatic machine which processes a load of parts at a time. In cyanide zinc plating, the time cycle is de termined by the number of tanks (Courtesy Udylite Corp.)



Our facilities for stretch and compression forming of difficult curved parts, for major industries, are unusual.

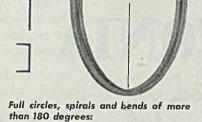
Parts are being formed in steel, aluminum and stainless steel from bars, strips, sheets, tubes, extrusions and rolled sections. Typical parts now in production are illustrated below.

The Metal Form Division of **THE CYRIL BATH COMPANY** is devoted to forming to customers' requirements the difficult curved parts dictated by modern design ...

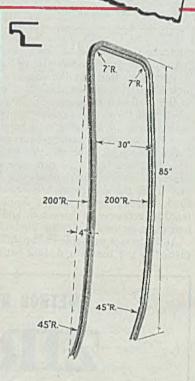
Z'OFFSET P'R. ZO'R. IOO'R. IOO'R. IOO'R. ZO'R.

Varying Contours throughout the bend:

BATH forming methods are particularly adaptable to inconstant curves varying in radii through the bend. Shallow or tevere bends formed practically without springback and with constant part to part duplication, each part accurate to template. Bus Bumper illustrated is formed in high alloy stock. Radius bends in flanged sheets: Most such bends are made without notching at corners or buckling of flanges. Metal is forced to flow with the bend, inner edges are compressed, outer edges stretched.



Bends of more than 180° are formed economically and to close tolerances with virtual elimination of springback problems and without expense of collapsing die arrangements. Such bends can be formed in constant radii or with varying degrees of curvature throughout the part.



Contouring in two planes:

Door frame illustrated for use in motor coach follows the contour of modern coach body. Special aluminum extrusion is formed from straight length to inverted U Shape with simultaneous variation in plane of leg. BATH forming methods make possible production of parts Involving changing radii, reverse bends, and curvature in more than one plane.

We are especially well equipped to produce more Turret Rings, Bumpers, Carlines, Roof Rails, Ribs, Body Posts, Wheelhouse Angles, Mouldings, Trim, Spar Attach Angles, Door Frames, Rub Rails, Channels, Sash, Cabinets, Tube Frames. Write, wire or phone us today for quick action.

THE CYRIL BATH COMPANY MUCH States Outdows

	and the second second	till osition	Ba Comp	rrel osition
Constituent	g./l.	oz/gal	g./l.	oz/gal
nc Cyanide	37.5	5	60	8
dium Cyanide	22.5	3	30	-4
odium Hydroxide	30.0	4	45	6
lercury Salt (added after dissolving m sodium cyanide).	0.25	0.03	0.25	0.03
Operating Condition	ons			
emperature			0-50°C (8	6-122°F
urrent Efficiency urrent Efficinecy				.85-95%

Zinc Cyanide	60-82	8-11	60-82	8-11
Sodium Cyanide	18.7-64	2.5-8.5	34-75	4.5-10
Sodium Hydroxide	75-112	10-15	75-97	10-13
Corresponding Zinc Metal	34-45	4.5-6.0	34-45	4.5-6.0
Total Equiv, Sodium Cyanide	68-135	9-18	82.5-142.5	11-19
Ratio M (Total NaCN/Zn)	M = 2.0-	3.0	M = 2.5 - 3.2	
Operating C	onditions			
Temperature	45°C (68-1	113°F) extrem	ne; (82-100°F p	referred)
Current Density				
Current Efficiency				

production of bright deposits without bright dipping. When the plating bath is in operation, the addition agent is depleted and the rate of depletion, based on the particular operation, can be established and thereafter readily maintained on the basis of the weight of zinc deposited or number of ampere-hours passed through the bath. The selection of addition agent and hence the particular commercial process to use depends in a large part upon the degree of brightness desired, whether or not bright dipping is feasible, economy of operation, and various other factors.

An important principle in "bright" zinc plating is the use of a plating bath virtually free from heavy metal impurities and employing high purity anodes". The fact has long been recognized that even minute amounts of some heavy metals markedly affect the color and brightness of deposits. There are two methods of purification in general use: (1) Addition of 0.25 to 2.5 g./l. sodium sulfide in the form of a concentrated solution; this treatment precipitates lead but not copper; (2) addition of zinc dust in approximately the same amount as above, followed by thorough stirring and filtering.

Another important point in "bright' zine plating is careful control of solution composition with particular note of the value maintained for the ratio M of the total sodium cyanide to the zinc me

In general, a low M value requires use of a high current density and increase ing the value of M lowers the "big plate current density range. If all operating factors are to be maintained their optimum it is also well to note the ratio M is somewhat dependent u the temperature of the bath. Tabl shows the influence of temperature optimum M values":

	Table II	
Optimum	M Values vs. Temperat	ures
Ratio M		
Optimum	°C	
2.6	27.8-30.6	82
2.8	31.1-33.3	83
3.0	33.9-37.8	93

The caustic soda content is in get less critical than the M factor but necessary to maintain at least the mum concentration shown in the range bath compositions to insure good ficiency and "bright" deposits.

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Plating Solutions, Natl. Bur. Stablaute at Paper No. 195 (1921). ²⁰Hull and Wernlund, "Modern Electu ing," Electrochem. Soc., p. 363 (1942). ²⁰See Reference 35, p. 365; also see F

ence 14, p. 331. ²⁷Bregman, *Iron Age*, 152, 51 (1943); covered by Du Pont U.S.P. 2,075,623 146,439.

146,439. ³⁸Van Winkle, U.S.P. 901,758; Prodet Wernlund, U.S.P. 1,435,875; Haas 1 1,451,543 and 1,497,265. ³⁹See Reference 35, p. 366. ⁴⁹See Reference 35, p. 369. ⁴⁰Oplinger, U.S.P. 2,075,623; 2,146,433 ⁴⁵See Reference 35, p. 368

⁴²See Reference 35, p. 368. (Continued next week)



THE structural disintegration of refractory shapes made from zirconia can be eliminated by the addition of certain oxides that "stabilize" the crystal form of the material, and by special heat treatment, according to R. F. Geller, National Bureau of Standards, Washington, who has been working on this problem.

Although zirconia has been used for several years as an opacifier in enamels and to some extent in glazes, its use as a refractory has not increased, even though it is available in a very pure state at comparatively low cost and possesses many valuable properties such as high melting point, chemical stability, hardness, and other physical characteristics.

Its disadvantage is that when made into refractory shapes these are inclined to disintegrate rather rapidly. This manifests itself by progressive cracking until the entire shape has broken up into small cubical pieces. The cracking is caused by large and very rapid changes in volume that accompany alterations in the crystalline structure of the material.

As published information indicated that the addition of certain oxides would change this crystal form to one of greater stability, experiments were made at the Bureau using the oxides of cerium, yttrium, silicon, magne-sium, and calcium. The specimens of these mixtures were heated to various temperatures and their length changes determined during both heating and cooling.

The results show that irregular thermal length changes were pre-vented. However, expansion during heating and contraction while cooling was always relatively high, and a though the tendency to structural disintegration is overcome, the resistance of the material to severe thermal shock is still comparatively 10%. This is to be expected, because of the poor heat conductivity of zirconia as compared with other materials of high thermal expansion, such as alumina, magnesia, and beryllia.

GEARED TO PROGRESS

Alloy Steels Designed for the Job

• This cluster gear takes a terrific beating in a truck transmission. Added to the grinding stresses of gear meshing with gear are the strains of temperature changes -broiling heat and bitter cold. It takes a specialized alloy steel manufactured under precision control to stand up under these conditions-a steel that is designed for the job.

Co-operating with motor truck engineers, Wisconsin Steel metallurgists developed an alloy steel that was just right. In this and countless other applications, they engineered the steel for the job it must do.

Constant experiment, constant scientific investigation make possible these masterpieces of metallurgy. Infinite care in production results in a uniformly excellent product. Together these factors have built Wisconsin's reputation for progress in alloy steel development.

Take your problem to our sales and metallurgical staffs. You can be sure that topflight scientific skill will be applied to your specific steel requirements. Wisconsin is geared to progress!

WISCONSIN STEEL COMPANY (Affiliate of International Harvester Company,

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Chicago 1, Illinois



, 135

STEELS

it took an

to finish these 5-year-o B & W Insulating Firebric

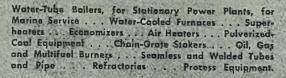
If you were to read through the service reports on B&W Insulating Firebrick, you might be surprised to learn how long these brick stand up. Case after case shows five years' life where only two or three years' life would be expected or had been realized with other brick.

There are a few spectacular cases too. For instance, the large stress-relieving furnace that was lined with B&W Insulating Firebrick that stood up for five years—still in excellent condtion—and failed only because an explosion wrecked the furnace.

Naturally, the same B&W Insulating Firebrick were ordered for replacement. And here again B&W Refractories Service came to the rescue on a vital rush job. The order, phoned to the nearest B&W office on a Saturday, was shipped the following Monday.

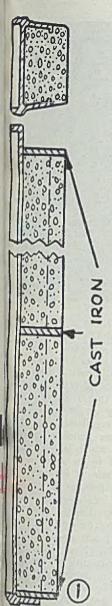
A notable—and characteristic—example of B&W dual service; service in the product, service in emergency deliveries. And an excellent reason why it will pay you to specify B&W.

R-218





/TE!



Developments in the Use of LUMNITE CEMENT

Liberal portion of coarse fire brick aggregate is beneficial to coke oven door linings. Clean used fiber brick such as come out of blast furnace stoves provides better aggregate than new brick. Thorough soaking of aggregate prior to mixing prevents a false quick set. Concrete lined coke oven doors installed on cold ovens give longest service lite

> By JAMES E. LUDBERG Carnegie-Illinois Steel Corp. Gary, Ind.

by a variety of disappointments. When a few simple principles governing the application of refractory concrete came to be recognized and applied in practice, it became a routine matter to work the material in the majority of applications with common labor.

The earliest experiments with refractory concrete in this plant were in the lining of oven doors, a troublesome item of maintenance in almost any coke plant. It is one which involves not only the cost of the linings, but also loss of appreciable amounts of coal into coke screenings, and formation of objectionable quantities of "black butts" at the door ends of the coke mass, when linings are permitted to deteriorate.

In the original experiments where monolithic linings were cast into conventional cast-iron doors, many failures were experienced from the shearing off of large pieces of the concrete projecting beyond the metal body of the door. It was finally recognized that concrete linings of this character were failing because of stresses to which the individual blocks of a bricklined door were not subjected. A cast-iron door body goes through a cycle of flexure in the course of the coking period, due to the differential heating of its inner and outer parts. This flexure is of sufficient magnitude to rupture a rigidly attached and inflexible monolithic lining, while it does not adversely affect a brick lining door because no matter how carefully

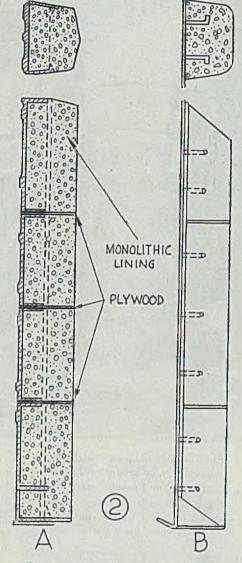


Fig. 2—(A) Coke oven door with cast-iron lining retainers. (B) Coke oven door of fabricated steel with hook lining retainers

the blocks of such a lining are laid they are still relatively free of each other and the body of the door.

When this had been recognized the first remedial step taken was to subdivide the door into two separate blocks by means of metal (either iron or steel) plates. Considerable improvement in performance of the linings resulted from this practice. The present practice is to subdivide the linings into three or four blocks with pitch-coated 16-gage plates or plywood fillers. Further improvement, to the extent of consistent success, resulted from heavily coating the inside faces of the door body with pitch and pasting roofing paper over this before pouring the lining. The pitch and paper burn out when the door is put into use, creating voids which leave the lining consisting of several individual blocks each sufficiently free to prevent setting up of destructive stresses when the door flexes or becomes bowed.

Another problem recognized in early experiments was that of properly supporting and reinforcing the blocks of lining. The first attempts at reinforcement were

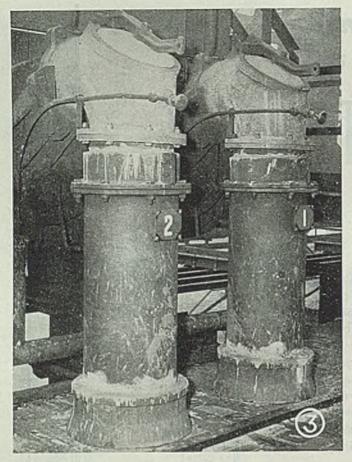
Fig. 1—Early design of monolithic coke oven door lining

EXTENSIVE use of Lumnite refractory concrete in the Gary Works Coke Plant, not only for a great variety of maintenance uses but increasingly in heavy construction work, had its beginning in 1928.

From time to time it has proven invaluable merely for its quick setting property, but in the majority of specific instances it has been used on account of its refractory properties. When combined with suitable aggregate it has in certain usages advantageously supplanted high-grade refractory bricks and shapes otherwise used; and has replaced portland cement concrete in numerous locations where this had been found to disintegrate under the influence of elevated temperatures.

When used to replace high-grade refractory bricks and shapes, it has generally resulted in lower cost of materials, economy of highly skilled mason labor, and in expediting the work.

The present highly satisfactory results were not arrived at without much experimentation, attended in the earlier years



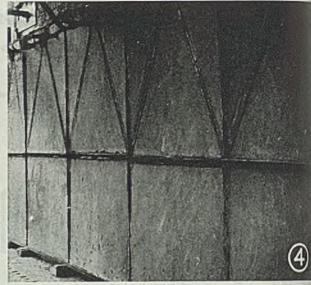


Fig. 4 — Insulating shields for protecting workmen making repairs to coke oven walls before their refractory service life a reached. This was especially true in case of linings for doors for high over In the first attempts, heavy castings w bolted to the bottom of the door, but was later realized that a 1-in, cast in plate supported by gusset plates we serve the purpose excellently.

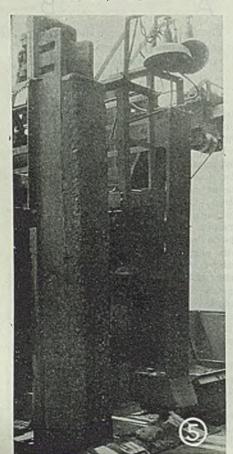
While the proper handling of the mechanical factors which have been a cussed was found to be necessary successful manufacture of refractory of crete oven door linings, as the develment progressed other consideration came to be recognized as significant.

One of the most important of the had to do with the size gradation of fire brick aggregate. Numerous faile of linings made from small size aggress led to trials with increasing proporti of larger sizes. The results of such periments showed that, at least under conditions, a liberal proportion of con aggregate ranging up to 21/2 in. or mot decidedly beneficial. It was also lean that the best results were obtained o by the inclusion of a considerable prop tion of finely ground materials. These are necessary to achieve the greatest of sity and impermeability in the concr The finest sizes are believed to re chemically with the high-alumina cent when burned at high temperatures and this reaction, certain highly refract minerals are produced which increase refractoriness of the matrix, and crystallizing add to the mechani strength of the concrete.

The fact that all of the aggregate prepared in a dry pan mill may have bearing on our success with refract concrete method of preparation. It results in the production of an ample portion of finely ground material who might not be the case where another for of crusher was employed.

The achievement of proper proper ing of the large and small sizes of sky gate has been arrived at through a course of practical experimentation. The present practice is to tak product from the grinding mill, separ this over a ³/₄-in. square mesh arr and use 2 cu ft of each of the plus his

Fig. 3—Ascension pipe and bend extension of by-product coke oven lined with Lumnite cement
Fig. 5—This coke oven door of type shown in Fig. 1 was in continuous service for 9 years



naturally based on experience with reintorced portland cement concrete for structural purposes. It was soon found that such reinforcement was actually detrimental rather than helpful because of the effect of the heat reaching the reinforcing members.

One solution to the problem was to design the door body to provide for holding of the concrete without the use of any actual reinforcement. The design to accomplish that is shown in Fig. 1. This design worked well and some of the doors made in this manner have been in constant use for 9 years without failure.

A more recent modification of this design is shown in Fig. 2A. This type of door was used throughout the DPC unit built at Gary Works in 1943. In this design, the lining receives additional support from the horizontal ledges, yet these ledges are not adversely affected by the heat because they extend to the back of the lining and are kept cool by the air.

In a new all-steel fabricated door, designed and built at Gary Works, the attuchment and reinforcement problem was solved in a different manner. As shown in Fig. 2B it was solved by the utilization of seven pairs of 1-in. hooks welded to the back plate and extending into the concrete. As with the ledges, these hooks are cooled by extending to the back and hence do not become overheated. With this design of door and lining, refractory concrete only, and no metal, extends into the oven.

It was also found necessary to support the concrete lining, by some means, at the bottom. Without such support, the linings tended to fail mechanically long

The office manager, the artist, and the photographer!

(AND WHY THEY VISITED THE DRAFTING ROOM)

First time any of them had visited the drafting room!

But they'd heard that an Ozalid machine-recently installed to reproduce engineering drawingscould also reproduce-and simplify -much of their own work.

The Chief Draftsman obligingly listened to their accounts of varied problems and said:

"Ozalid can save you man-hours and dollars . . . as it does us."

He demonstrated how anything

drawn, typed, printed, or photographed on translucent material could be reproduced in seconds-not minutes. AND be reproduced-not as a negative-but as any one of ten types of positive, Ozalid prints.

In different colors – black, blue, red, or sepia; on different base materials – paper, cloth, foil, or film.

He showed how these Ozalid prints could be used in many unique ways—for jobs beyond the scope of any other reproduction process.

THE ARTIST was intrigued by the manner in which advertising displays and folders could be made, and at the speed with which a layout could be altered and a new effect created.

Now, he said, he could do twice the work. (He wondered if he could collect twice the pay.) THE PHOTOGRAPHER was speechless when he saw Ozalid Dryphotos (continuous-tone photographic prints) produced in 18 seconds flat from a positive-film "master." Not one bath was necessary-just the same two steps employed to make all Ozalid prints-Exposure and Dry-Development. THE OFFICE MANAGER, a man of great reserve, examined an Ozalid Rapid Black print of a typewritten report and said

print of a typewritten report and said; "I'd swear this is the typed original... except that I can't smudge it."



DIVISION OF GENERAL ANILINE & FILM CORPORATION JOHNSON CITY, NEW YORK Ozalid in Canada—Hughes-Owens Co., Ltd., Montreal

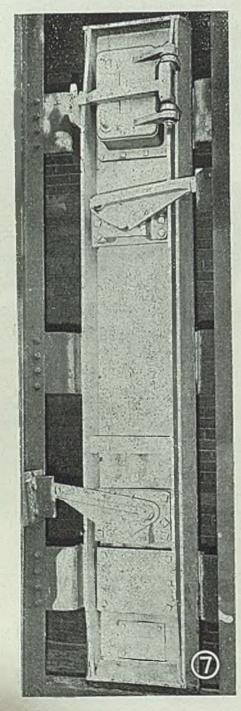


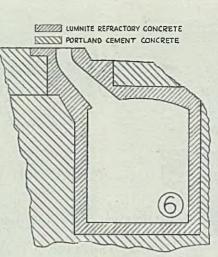
Suggestion :

If you have an Ozalid machine in your drafting room, stop by and ask for a demonstration. If you haven't adopted Ozalid as yet, write for Simplified Printmaking. It tells the whole story and contains samples of the 10 types of Ozalid prints you can make. and the minus ³4-in. sizes with one bag of Lumnite cement. While the screen analysis of the mixture may vary within reasonable limits, continued attention and control are necessary if the best results are to be obtained. One definite requirement is that there should be present at least 15 per cent passing through a 100mesh screen. The sieve analysis of a grab sample of the aggregate gave the following results:

A	Accumu-
	lation %
Screen Size	retained
2"	. 5.9
1½"	. 15.8
1"	. 34.6
%"	. 51.2
1/8″	. 60.4
20 mesh	. 71.6
100 mesh	. 85.4
Passing through 100 mest	h 14.6

Another important consideration is





that of the composition of aggregate. It has been our experience that clean, slagfree, used fire brick which has been severely burned in service provides better aggregate than does new brick. Old blast furnace stove brick has been found to be particularly satisfactory. Practically all fire brick undergoes more or less shrinkage when burned at high temperatures, hence, the use in refractory concrete of aggregate derived from reburned bricks prevents the development of internal stresses in high temperature service, which in the case of at least some new brick might be sufficient to promote disintegration of the concrete.

The procedure for lining the doors has become a routine of well established practice. The first operation is to prepare the door castings and forms. The castings, and in the case of the steel fabricated doors, the back plate and hooks are coated with a thick layer of pitch and covered with roofing paper. The forms are painted with a light mineral oil prior to assembling to prevent the concrete sticking to them. Whenever possible, metal forms are used because they give a smoother finish to the concrete and there is no chance for absorption as in the case of the wood forms.

The concrete is prepared in a conventional type concrete mixer. The aggregate is carefully measured in measuring boxes provided for that purpose and is then placed in the mixer drum in which approximately half of the required mixing water for the batch had been added previously so as to soak the aggregate thoroughly during the first few turns of the mixer. Then the Lumnite is added and the mixing continued for 1 to 11/2 min. During this mixing period additional mixing water is added as needed. Prolonged mixing should be avoided because it will cause the concrete to become too quick setting.

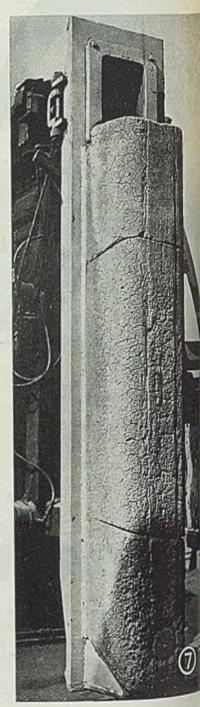
One detail of our practice believed to

Fig. 6—Waste heat tunnel of byproduct coke oven showing position of Lumnite refractory concrete

Fig. 7—Interior (left) and exterior (right) views of coke oven door with hook lining retainers of fabricated steel shown in Fig. 2b be vital to the successful performance the refractory concrete is the thorous soaking of the aggregate prior to is be ing put in the maxer. Such soaking re duces the absorption of the mixing wat by the aggregate and prevents a fal "quick setting" of the concrete what otherwise appears to take place.

In the earliest experiments attemp were made to work with a concrete or taining a minimum of moisture. In our pacting it in the forms an objectional amount of voids resulted. In the press consistently successful practice, the or crete is mixed with sufficient water pour readily and is densified in the for by the use of compressed air operat vibrators until voids are practically dis inated.

Particular attention is given to cur the concrete by keeping the surface with a fine spray as the setting progress Concrete lined doors placed on cold on





year on cleaning costs alone,

SAVE

METAL WORKING OIL Think of it! Literally thousands of hard cash

... by sensational new

SOLUBLE

Think of it! Literally thousands of hard cash dollars saved on a single operation by new Shell Views Oil Here's how it happened: A West Coast manufacturer found that in the deep drawing of his aluminum parts a great deal of time and labor were being eaten nn by having to use an of his alumnum parts a great deal of time and labor were being eaten up by having to use an elaborate system of washing in order to remove the drawing lubricant used. the drawing lubricant used.

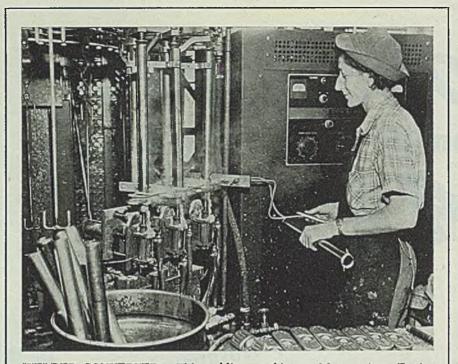
Shell Lubrication Engineers were consulted. Snew consumers and the second net al working oil entirely new. A lubricant that

metal working on entirely new. A moricant that can be removed with warm water, leaving the constant and a morial to main and that can be removed with warm water, leaving the metal surface clean enough to paint ... one that is a surface to be the surface to be surface to be the surface to be surface to be the surface to be the surface to b metal surface clean enough to paint ... one that combines excellent lubricating properties with high soaling officiency is non-corresive gives combines excellent lubricating properties with high cooling efficiency, is non-corrosive, with good rust protection with high wetting character, istics that makes it extremely economical to use

good rust protection with nigh wetting character-istics that makes it extremely economical to use. Since their introduction scores of perform-Since meir introduction scores of periorna ance records have been broken by versatile, new chait Winn Oil Free Call Jassillo on this constantional ance records have been broken by versatue, new Shell Virgo Oil, For full details on this sensational time of oil Company Incom-Shell Virgo Uil. For full details on this sensational line of oils, write: Shell Oil Company, Incor-porated, 50 W. 50 St., New York 20, N. Y. Or 100 Bush St., San Francisco 6, California. Have you your E. C. Calculator? If not, send to Shell today. It's free.

ELL VIRGO OIL

0



WELDER CONVERTED: This welding machine at Monroe Auto Equipment Co., Monroe, Mich., is brazing bases to tire pump barrels, three at a time, in order to help the factory attain the 10,000 units per day scheduled

and heated up with the battery have proven to have the longest service life. If doors must be put on hot ovens, the practice is to let them air set for 10 to 14 days and to charge the oven immediately after the door is affixed so as to retard the flow of heat into the lining and thereby temper it.

As these problems of oven door linings were being solved, many other uses for Lumnite cement in maintenance and construction were being found around the coke plant. While relatively small as to the quantity of cement used, one of the most helpful of these uses has been its use in patching around inspection and charging holes on the battery tops and in general keeping the top air and watertight. Applying by means of a brush and/or trowel, a thin mortar of Lumnite and finely ground fire brick, it has been found easy to maintain inspection hole blocks and similar tools at an appreciable saving.

Manufacture of Special Shapes

Another use has been that of the manufacture of special shapes. Its ease of use and its adaptability to many different types of uses made it the ideal materia! for inspection hole casting blocks, charging hole blocks, lintels, ascension pipe seat blocks, etc. The war-time shortages of some special shapes and even some castings have been met effectively by this material.

One of the most satisfactory of all uses of Lumnite cement concrete around the coke plant has been its use in ascension pipe linings. In this usage the complete ease and speed of application are in direct contrast to the difficulty and tediousness of applying certain plastic refractory mixtures which have been used for this purpose. Perhaps even more important, the refractory concrete linings give every indication of being permanent in this service, while the rammed plastic materials have burned out and have required replacement. Recently 35 refractory concrete lined ascension p.pes which had been in continuous service for 10 years, were removed to make extensive oven repairs. They were found to be in excellent condition, though not one of them had ever been patched or repaired in any way.

In the construction of nine large batteries of underjet ovens during a period of 10 years, the concrete slabs upon which the regenerator walls rest have been poured with refractory concrete composed of Lumnite cement, lake slag (blast furnace slag originally dumped on the lake front and after protracted washing on the lake shores, reclaimed by dredging, screen sized and freed of fines) and washed torpedo sand. This material was used to prevent the disintegration observed in the pads of earlier batteries which had been poured with portland cement concrete.

Several years ago it was found necessary to make emergency repairs to an old, badly deteriorated battery in which large areas of the fire brick lining of the stack flues and of numerous waste-gas connections to the stack flues had fallen down. Time would not have permitted the replacement of the fire brick linings even if the special shapes necessary had been available. It was decided to replace these linings with refractory concrete made of Lumnite cement and crushed fire brick. Using movable metal forms, the necessary repairs were made expeditiously and when the battery was torn down 4 years later this concrete was found perfectly intact, even though it had been subjected to extraordinarily severe condition throughout that time.

In view of this service, complete she flue linings of refractory concrete (Fig. 6) have been used in five new b teries of ovens in this plant, as well several more in other plants.

Also based upon this experience been the highly successful use of refr tory concrete in the roof arches of waste-gas canals at open-hearth fuma in this works.

The use of Lumnite for a constant purpose of a different nature has a that of making heat insulating shi When making extensive repairs of an ber of walls of an operating battery, it been found desirable to insulate the jacent walls in some manner to prothe workmen and to prevent an unloss of heat. Excellent results were tained by the use of large shields were against the walls. The shields are un of angle iron and wire screen cover with a 34-in. thickness of a paste of Dnite cement and shredded asbestos. shields in place are shown in Fig. 4.

Uses In Combatting Corrosion

No discussion of coke plant uses Lumnite would be complete without re ence to its many uses for combatting rosion.

Stacks carrying gases from waste flues operate at temperatures which mit dilute sulphuric acid condensate form, and over a period of years such o densates attack the mortar of the b linings. Under the reconstruction prog which has been rather extensive at Gary Works considerable Lumnite mo has been used for repointing the lin of some of the stacks, and as gunite lin in others. Where new brick linings installed, the mortar for the joints made with Lumnite. In these app tions, it is important to use an aggre which will also be corrosion resistant mortar for joints, siliceous sand is w for the gunite, either Haydite or traps screenings.

In the production of ammonium phate, various means have been tries the past to protect regular concrete mortar-coated steel from the destruccorrosive attack of sulphuric acid ammonium salt. Concrete floors foundations for saturators, pumps, dryers, storage rooms, etc. have be source of fairly constant maintenance Lumnite was used for such purpo Here again the aggregate used with la nite is of extreme importance. Ordin sand and gravel in this area, while cellent for regular concrete, is not part larly corrosion resistant. Materials these uses should be of a highly slice nature, or otherwise resistant to d sulphuric acid and ammonium salt. success of various installations has the early trials of such concrete mortars.

This paper was presented before a met of the Blast Furnace and Coke Association the Chicago District. It was awarded farf in the coke plant division of the fourth and technical papers contest sponsored by the sociation. Now-a silicone varnish that cures at 300°F

Dow Corning 996 is an electrical impregnating varnish for low temperature baking.

CONFS

Dow Corning 996 was developed to provide manufacturers of new equipment and rewinders of old equipment with a heat resistant, waterproof silicone varnish which can be cured at temperatures obtainable in ovens now used for curing organic insulating varnishes.

Dow Corning 996 is used as the dipping or impregnating varnish for equipment wound with typical silicone insulation components. These include Fiberglas cloth, tape and sleeving varnished with IIC 993; silicone bonded mica-Fiberglas for ground insulation; silicone bonded Fiberglas served magnet wire; silicone-Fiberglas laminated coil separators and slot sticks, and Silastic* coated lead wire.

Electrical equipment, wound with silicone insulating components and sealed by impregnating with ID 996, will have the high order of thermal stability and retention of waterproofness characteristic of silicone insulation.

Dow Corning 996 thus enables all types of electrical shops to realize the advantages of silicone insulation. It is recommended for use in equipment which is to be operated at temperatures up to 175°C. (347°F.). For higher operating temperatures, or extremely severe service conditions, ID 993 should be used throughout. The same methods of dipping, spraying, or vacuum-pressure impregnating that are used for applying conventional organic varnishes can be used with ID 996.

VARNISH

PROPERTIES—Dow Corning 996 is furnished as a 50 per cent by weight solution in an aromatic solvent and has a viscosity of 2 to 5 poises. In this consistency DC 996 is suitable for impregnating electrical equipment. It can be reduced to any desired viscosity with aromatic naphtha.

Dow Corning 996, when coated on metal, air dries to a slightly tacky, soft film. Baking the coated panel at 150°C. (302°F.) for a period of four hours will cure the coating to a non-flowing, tack-free, flexible film. DC 996 has ample heat stability for continuous use at temperatures as high as 175°C. or for intermittent use at higher temperatures.

ELECTRICAL PROPERTIES OF ID 996—(measured on coated panels at 25°C. and 50% relative humidity.)

Dielectric Strength, volts per mil	0 2000
Dielectric Constant, at 1000 cycles	30
Pov er Factor, at 1000 cycles	0.70%

DOW CORNING CORPORATION

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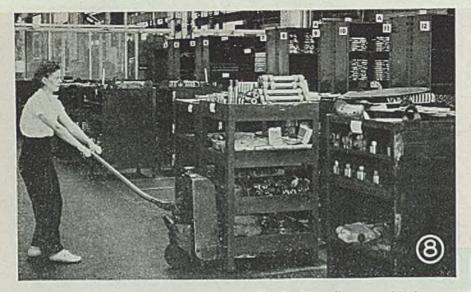
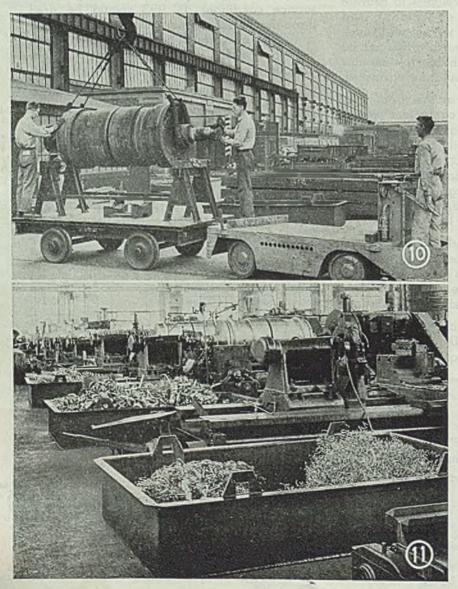




Fig. 8—Manually operated hydranlic lift trucks handle assortments of finished small parts being moved from storerooms to assemblu on accumulating trays pictured here

Fig. 9—Special highway type trailers then move trays to salvage department



Standardized Handling

(Continued from Page 107)

the co-ordinate use of fork trucks a either rail-car or highway-type truc and trailers, the fork truck serving load and unload.

Immediately adjacent to the building of the various divisions are paved and age yards which are provided with crasways and adequate space for storage palleted materials. Both the roadwiand railways intersect these cranewiand connect with craneways within i buildings. A common method of morheavy work from yard to shop crane how within the building is by means dirailcar pushed or pulled by the burdbearing truck assigned to the particudivision.

Space underneath the yard-crane re ways, amounting to one-eighth to exsixth of the total craneway area, a useless for crane storage, is utilized b pallet storage. In laying out pallet stage yards, one of the major aim is allow enough space to make it necessary to stock more than one b of material in one pile, thus keepeverything accessible.

Both 3 x 3 ft and 4 x 4 ft pallets r used for storage, depending upon bulk and loading. No rules are r scribed for loading except safety, \pm ility, and a 3-ton weight limit.

Since the loads in storage range up 3 tons and are tiered 2 to 4 ft high, 3fo k trucks are used for receiving and carrying them inside to the start of p duction.

The layout of the individual plant planned for ease of handling, ease receipt and dispatch, and afety traffic. This is largely a matter of lowing adequate space in the replaces.

For ease of handling, space is r vided for storage of incoming mater finished parts and sub-a semblies, between each work a ea and the a room for two pallets or pallet loads a 45° angle to the aisle. This reduct the turn necessary to pick up and down. The size of the pallet allow for is, of course, the one best su to production convenience. The m location of the in-process storage sp has to be individually determined.

For ease of receipt and dispatch and is provided inside the doors the which roadways and railways of building so that loading and unloc can be done promotly.

For safety of traffic, adequate

Fig. 10—Forged 12-ton turbine to tor is moved from storage to rel car going into manufacturing are where an overhead crane can react it for assembling

Fig. 11—Special welded steel trays are used to accumulate turnings m machine shop



on Chrome Nickel Steel Rough turned very scaly chrome nickel forging -2' diameter x 10' long — in 30% less time, and with triple the tool life obtained from other tools, which could not stand up under the and with triple the tool life optained from other tools, which could not stand up under the plunge cut through scale.

In other words -- Kennametal Tools were up to In other words—Kennametal Tools were up to 6 times as serviceable—a fact of utmost sig-nificance to all who must now mainfacture posterior products—economically

SUPERIOR CEMENTED

KENNAMETAL Suc., LATROBE. PA

nucance to all who must now r post-war products—economically.

AADA MARE BE

connecting work and storage are the principal requirement. New buildings are laid out for 8-ft aisles and space adjacent for the 4×4 ft pallets at 45° angle. When older buildings are revamped at the time of changing to a new kind of work, these standards are approached as closely as possible.

For convenience in controlling trucking movements, all divisions are zoned, and one or more trucks are assigned to each zone. The storekeeper is responsible for dispatching trucks. In zones having relatively light traffic density, the truck operators receive move orders from the storekeeper and execute them individually. In zones having relatively dense traffic, the truck operators work from orders moving with the loads.

The complement of trucks already assigned to the several divisions, in addition to 3-ton fork trucks already mentioned, is determined by the work.

For example, in certain manufacturing operations, it has been found that handling motions can be saved by doing the work directly on pallets resting on work benches. In such cases, the forklift truck used to bring and remove the work may have to travel beyond the main aisles. This puts a premium on maneuverability and favors use of one of the smaller sizes.

Narrower Aisles Necessary

As another example, in a plant built prior to the inception of the present handling plan, space may not permit the standard 8-ft aisle and the 45° placement of pallet loads. It may be necessary to compromise with a somewhat narrower aisle, and to place the pallets at 90°. Here again, one of the smaller sizes of fork truck is indicated. Or if tiering is not a factor, a motorized hand-lift truck may be best.

In-process storage of assorted small lots of material so that they will be individually accessible yet not occupy excessive space, is a problem common to a number of divisions. For pallet loads, shelves have proved the most generally satisfactory solution, in conjunction with a fork-lift truck, as shown in illustrations.

For bar stock, classified storage racks proved very satisfactory, in conjunction with cranes. From the storage-yard craneway into the building, the bars are carried by burden-bearing trucks. A handling short cut used with the storage racks is a pair of extension arms which can be applied to the angle-iron supports. Stock can be lowered by crane upon arms, then pushed on the supports.

Also common to number of the plants is the problem of making up assortments of small finished parts and delivering them to assembly areas. For this purpose, "accumulating trays" are used. The type used in the assembly of turbines is illustrated. They are designed so that they can be picked up by hand-lift trucks and carried past the stock bins while the assortments are being made up, then carried to the assembly area by either hand-lift or fork-lift trucks.

In the foundry, castings are carried

through rough grinding and inspection operations in skid boxes by platformlift trucks. This method is employed in preference to the pallet-fork-truck method principally because loads are heavier and bulkier and tiering is not a factor. Yet the method is readily integrated with pallet handling at the time castings are dispatched from the foundry by the simple expedient of putting the castings into pallet boxes at the last inspection.

Although not assigned to any of the plants as standard handling equipment, a crane truck is kept available for special duties. Such a job was created recently when need for additional manufacturing space in the motor plant encroached upon space formerly used for

Electropolishing Unit

To aid fabricators of stainless steels in preparation for production of civilian goods by evaluating electropolishing process in their own plants, Market Development Division of Rustless Iron & Steel Corp., Baltimore 13, is making available without cost electropolishing demonstration units based on a patented process.



Its engineers will direct installation of models and assist in initial use of the citric-sulphuric process which is particularly applicable to finishing complex formed and welded wire products and other small items difficult to finish mechanically.

storage of armatures and motor frames while awaiting delivery to assembly.

Neither armatures nor motor frames lend themselves readily to storage on pallets. They had been stored in an assigned area under the craneways. On the other hand, no crane was available in a nearby storage shed which was otherwise the most convenient space for the purpose that could be pressed into use quickly. By a co-ordination between fork-lift and crane trucks it was made to serve.

At the final operation, the armatures and frames are put on pallets and delivered by fork-lift truck to the storage shed. There the crane truck picks them up, setting the armatures in racks and elevating the frames for piling. Saddleshaped, padded racks are used to protect the armatures while they are being carried on pallets. For engaging the hoist hook of the crane truck, a lifting ring is screwed on the ends of the armatu: shafts.

Although the unit-load method is most commonly applied to material handled by industrial trucks on skids or palletu at the Erie Works it is being applied also to the handling of considerable larger units in salvage and waste dis posal.

Machine turnings, for example – d which approximately 350 carloads as returned to steel mills in the course d a year — are accumulated in the various machine shops in steel trays which as loaded on industrial flat cars, and the some cases on highway-type trailers, as der the craneways for delivery to the salvage department.

Another example is the method a handling plant rubbish. It is done blarge semi-trailers having steel bodie 16 ft in length and 7 ft clear inside width with 6 ft high roof which ar parked at approximately 75 pickur stations. On arrival at the salvage de partment, they are turned at any desired angle to the tractor up to 90° and hoisted to a 40° dumping angle.

Responsible for the application d modern handling methods to the salvage and waste-disposal work is F. E. Bliva supervisor of salvage.

Waste Time Unloading

But there remains one general source of waste which Mr. Bliven is now 20 tacking. It is the time wasted to us load incoming cars and trucks becaus the shipper could not load in units on 1 to 3 tons on pallets. It is also be time wasted to load outgoing cars as trucks because the consignee is p equipped to receive in unit loads.

Nevertheless, progress is being met One of the best examples is the applition of the unit-load method to be shipment of malleable-iron field-fram castings to the River Works at Lym Mass., Motor Mfg. Division.

With arrangements as worked out we the transportation department at Lyr a 4 x 4 ft single-face pallet was adopted on which was assembled a four-side bin, the corners being dove-tailed held together with large corner staps Two steel straps were applied girthwe and two fore and aft running in the direction of the stringers. These co tainers hold up to 3 tons of castings.

The loads are generally placed is wide and two high in the cars by for lift trucks, 24 containers per car. Rupper and lower tiers are fastened side strapping in the car but, genera speaking, the load is free to float it has been found that no damage sustained in a free movement.

The containers are easily known down for return and re-use merely is freeing the straps and removing is staples. Some 1600 tons of castings wer shipped last year in this manner. The time required for loading a car average around 12 manhours compared to some 112 manhours when the castings wer handled individually.



Take it from Dusty-The New Vertex is a Honey!

J. R. Rhoades, our arc welding super, is strictly the Conservative Type. Get him used to a swell electrode like Metal & Thermit's Vertex, and you have one heck of a time selling him on an improved version of it. I know, because I'm his assistant and I undertook the job.

"You can talk till the cows come home, and then talk to the cows," Dusty told me. "I still will not believe that the Vertex rod I've been using for ages can be made still better. So now let's go to lunch." We went to lunch, and I kept at

him. Finally he agreed to try the new

Vertex rod and compare it with the old. Vertex, you know, is an allposition, general purpose electrode for mild steel work that can't be positioned—piping, structural steel work, ship construction, and so on.

Right after lunch, Dusty borrowed a helmet and gloves, took a handful of the old and the new Vertex, and made some sample welds. He must have been at it half an hour before he lifted his helmet and gave me this sheepish grin.

"Tom," he admitted, "I would not have believed it. This new Vertex handles even better than the old. It has better arc action. It produces even less spatter when used at maximum amperages. In fact, it's a honey. Stock a batch of it right away."

I did, and it's made a hit with everyone in the department. If you haven't tried the new Vertex yet, you're missing a good bet.

METAL & THERMIT CORPORATION

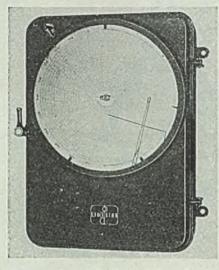
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INDUSTRIAL EQUIPMENT

Running Time Recorder

A new instrument for recording machire running time has been developed by Bristol Co., Waterbury 91, Conn., for checking machine performance. It records



the operating or "on" time of production machinery and other similar equipment. The chart record gives the total "on" time in hours, minutes and seconds for a given period. "Off" periods are also shown on the chart as well as the time at which they occurred.

Running-time readings are magnified in such a way that total operating time of a machine can be easily and accurately determined to within a few seconds.

Three-Way Machine

For boring, facing and tapping heavy duty valves for use in oil fields, a threeway machine is offered by Snyder Tool & Engineering Co., 3400 East Lafayette avenue, Detroit 7. Boring and facing is done with a 4-speed, single spindle head which is driven and advanced into the work by one of the company's selfcontained hydraulic guide bar units.

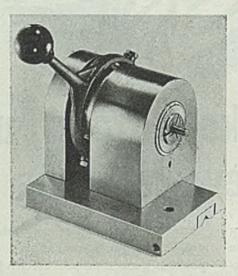
To the left of the operator and in front

of one of the two boring units is installed a lead screw tapping device which has also a variable tool spindle speed. Entire tapping unit is mounted on a guide bar slide for hydraulic rapid advance. Spindles are equipped with a breech lock and special tapered holes to make exchange of tools quick and easy.

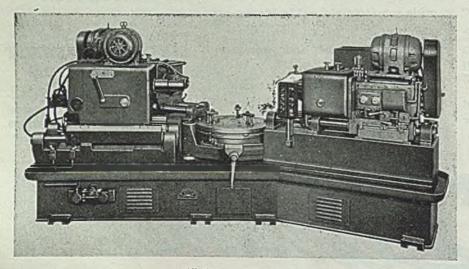
Index table is mounted on a manually operated elevating m.chanism which compensates for the various sizes of work and also brings tools concentric with boss on workpiece. This table is indexed for 180° with an intermediate index for tapping operation.

Collet Speed Chuck

A collet chuck is offered by Zagar Tool Ltc., 23880 Lakeland boulevard, Cleveland 17, to fit on a Sheffield grinder for grinding studs and other work to be



held in a collet. This is entirely a special tool adapted only to their machine, but it is independent insofar as its own bearings and all of its own collet closing mechanisms are concerned. Most of the collet closing mechanisms are standard parts of the company's 1 in. collet fixtures.

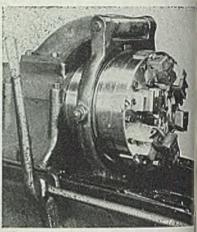


All claims are those of the manufacturer of the equipment being described.

Collet of the 5-c Hardinge type embodie all basic principles of the company standard collet tool. It does not more lengthwise in opening and closing,

Die Head

Landis Machine Co., Waynesher, Pa., annouces the new Lancn 4-in. sem receding six-chaser die head. It has capacity from 2¹/₂ to 4 in. pipe siz this range being covered by charholders mounted on slicles of heavy corsection to assure maximum rigidity Chaser holder slides are gibbed to be



head body to provide compensation wear. Interlocking design of hole and slide assures a rigid clamping act of two mating parts with only o clamping screw.

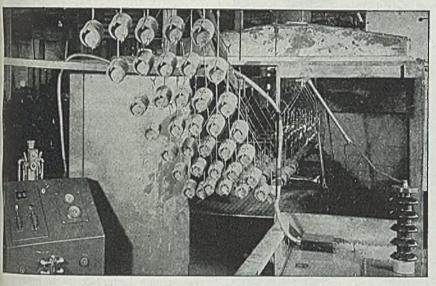
Unit uses the new Lanrac char which provides a rapid method of terchanging and setting the char Die head is of internal tripped type which a six blade, insert blade by reamer located within bore of he reams and chamfers the pipe during threading operation and opens head any predetermined thread length. The semireceding action on head eliminat possibility of any chaser leave off man on thread as head opens up. Reamer adjustable by an adjusting and class ing rod which extends through the m chine spindle. Any desired thre-length can be obtained by releas locking rod and turning adjusting right or left hand to increase or crease thread length. Any thread length within the thread length standards 2½ to 4 in. pipe sizes is obtainal All parts of the chaser head are man

All parts of the chaser head are main from either high carbon or special is steel, depending upon their function are heat treated or case carbonized precision ground to assure maxim accuracy. All parts of this die head is throughly protected against wear. Zetype fittings provide a means of fining heavy grease into the chaser disand other operating parts for lubricaing purposes.



SECOND SERIES - NUMBER THREE

DIPPED PARTS HAVE BETTER FINISH WHEN ELECTROSTATICALLY DETEARED



Fragmentation bomb parts passing over the detearing grid on a Japan Company conveyer line.

Electrostatic detearing, a method developed to remove e::cccs paint from the drain-off points of freshly dipped objects, has considerably broadened the scope of the dip-painting process.

When practical, dipping is naturally the preferred method of finishing. It is laster and more economical than spraying and it assures complete coverage with a minimum of wasted material. Its chief disadvantage has been the accumulation of tears at the drain-off points, complusing the baking procedure and often spoling the appearance of a product.

Hectrostatic detearing removes all exress material shortly after dipping has been place, and thereby makes possible the dipping of many parts which once required spraying. This new process consists of passing the work over a metal grid

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which is charged with 130,000 volts of electricity. As the dipped parts enter the electrostatic field above the grid, the powerful attraction between the work and the grid draws the excess paint off in thin streams. The work is then conveyed through the oven at a baking schedule properly suited to the entire coating, and a smooth, even film results.

While speedy and automatic in function, the detearing process requires considerable skill and experience if optimum results are to be obtained. The Japan Company, long a pioneer in the industrial finishing field, possesses that skill and experience in this as in other finishing processes. If you are using older methods, why not compare your costs and quality with ours? Perhaps you will want to make a change.



HENDERSON 5153



Before, during and after. These photos show a graphic demonstration of electrostatic detearing in action.

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Send for our IRON AGE article, "Electrostatic Spraying and Detearing". It contains full data on both electrostatic detearing and electrostatic spraying. --Reprints of other advertisements in this series sent free upon request.

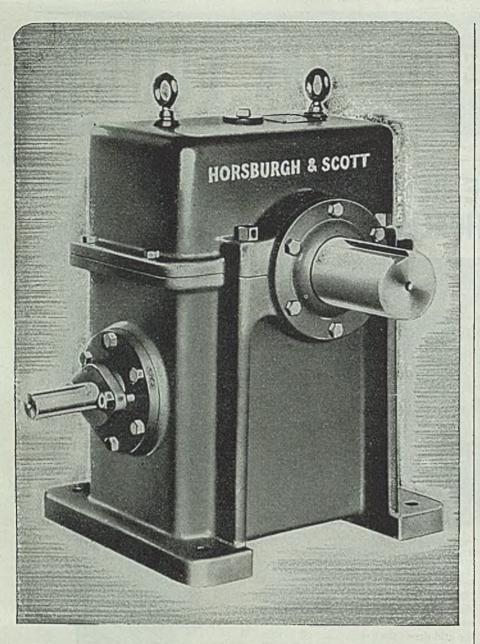


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How To Conserve Tool Steel

(Continued from Page 113)

developments in welding, silver soldering and copper brazing has made possible designs in assemblies that were not possible before.

II-Selection of Tool Steels:

Of the numerous grades of tool stead on the market there are usually one of two that are more satisfactory on a given job than the others. Experience often indicates the preferred grade but when experience is lacking on any particular job it often pays well to experiment with different grades. Thus it is generally true that most hand tools, as hand taps, hand reamers and other slow cutting tool as well as such tools as chisels and staking tools, do not require a high speed steel.

Good grades of straight carbon steel or the low alloy tool steels will serve excellently if properly hardened. The saving in cost is important as well as the saving in critical alloys. The main advantage in the high speed steel grades is to insure that the cutting edge will not soften at the temperatures used in cutting, and where the operation does not develop enough heat to soften the metal the straight carbon grades or the low alloy grades give excellent service.

Exactly the opposite is true in tools that are subject to severe service. Often the best grade of high speed steel available. containing up to 30 per cent alloy, will give enough better service to justify it use, not only from a cost basis but a a conservation of critical alloy. A few cases have been reported where high alloy grades containing cobalt have given two to three times as many pieces between grinds as the usual grades of high speed steel. While such cases are not too frequent they occur where finish cutting reaches speeds where the temperature of the tool is heated considerably. Under these conditions it is easy to see from ! mathematical standpoint that 1 h of tools will last two to three times as long and actually conserve the critical alloys as well as saving money.

Such cases are exceptional in the average shop and generally the use of the lowest alloy composition, or the composition containing the least amount d critical material is the best to use, providing the tool life is not out of line with the other steels. The molybdenum and the molybdenum-tungsten types have shown excellent results in most cases, and many instances have been recorded when a \$2-per-lb tool has been replaced by tools costing \$1.12 per lb with negligib change in tool life. Why pay extra in special grades when they are not needed In general, the molybdenum or mohb denum-tungsten grades give excellent results on roughing cuts requiring heavy feeds at medium speeds, give good results on old machines; or on jobs where a tough tool is required such as on I long overhang. The cobalt grades, either molybdenum or tungsten base, give best

How do americans KNOW HOW?

Hitler probably would have given much for the answer to this question because it was American know-howin battle and back homethat spelled swift disaster for Naziism.

American industrial and business knowhow is the wonder of the world and the voice of that know-how—the medium which brings you a never-ending flow of ideas and sound advice with which to profitably increase your knowledge of your work—is your business paper.

Your business paper has but one job in the world: *it must help you*. Its editors



and writers work twentyfour hours a day for you. They are skilled observers and reporters. They know your difficulties and they are constantly finding new and better ways

to help you whip those difficulties. Americans know how because we have the

greatest system of know-how dissemination in the world—our business press. If you want to constantly increase and enlarge your know-how, read and re-read every issue of your business paper. Remember this: the business paper reader is a better business man!



One of a series of messages prepared by the Business and Industry Department of St. Joseph's of Indiana, college for men, at Collegeville, Indiana.





HE compactness and portability of the Self-Contained Unit is made possible by the Roto-Clone with its exclusive feature of combining the functions of exhauster and dust precipitator in a single operation. The Roto-Clone and motor are mounted directly upon the dust hopper which also serves as a housing for the air filter. Filtering the exhaust air eliminates any need for outside duct connections that might limit the mobility of the unit. The dust collected by the Roto-Clone is deposited in a dust drawer to facilitate disposal. Servicing can then consist of installing an empty dust drawer, and transferring the loaded drawer to a central disposal point. Send for Bulletin No. 275D.



results only on very rigid set-ups, on steels hard to machine, where the speed is such that the chips come off blue or black. (Often it is better to cut the speed of the machine to get the best from the tool, even under such conditions.)

III-Use of Composite or Tipped Tools

A-Carbide Tipped Tools. The recent boom in carbide tipped tools needs little comment. Suffice to say that in jobs where these tools can be used the increased speed of operation has well repaid those who have had the patience to study how these tools should be used. Increased speed, greater power, and a rigid set-up are the main secrets. Of greater importance to the war effort was the fact that 1 lb of tungsten did 16 times as much cutting in a carbide tipped tool than in a solid high speed tungsten tool.

B-Cast Tipped Tools. The well-known cast tools such as Stellite, Rexalloy, Tantung and other tools became more popular in the days of increased production. But there has been a big boom in new types of cast tools. These usually contain above 30 per cent alloy and are so brittle that they are seldom used as solid tools. Brazed to low alloy or straight carbon steel shanks they give excellent tools at low cost and conserve the critical alloys, since less total alloy is used in the given tool. These alloy tools usually can be run at higher speeds and give longer tool life than the solid high speed steel tools, even of premium grades. Of the dozen or more grades of cast tools on the market today several have been proved to be enough superior to standard high speed steel that considerable reductions in machining costs have been made possible by their use,

C-Brazed High Speed Steel Tipped Tools. Born partly of necessity, and partly because toolmakers are always interested in salvage, the high speed steel tipped tools are the answer to many an operator's prayer. When difficulties developed in securing new tools on time, scrap tools have been brazed on to carbon or low alloy steel shanks and the job fini hed. The cheapness of the method and the conservation of high speed steel have added to the advantages and now many shops are using this method to prepare a major portion of tools that are used.

While scrap tools of short length have furniched a major portion of the tips in the past, some shops are now buying high speed steel for the purpose of making tipped tools only. Both lower cost of the tools and a conservation of the alloys used in high speed steel have furnished the motive.

Precautions should be used in this method. The silver solders generally used for this work flow at about the same temperature as the tempering temperature of the high speed steel, and unless care is used in brazing, the high speed tup may be overheated and softened in the process. One method of combined brazing and hardening in a single opera-

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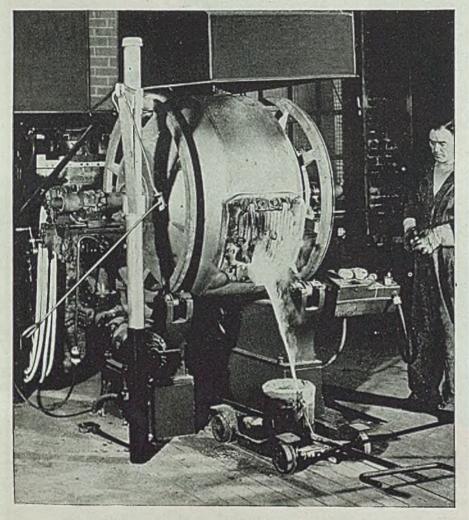
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700 lbs. every 40 minutes! That's the productive speed of a Detroit Rocking Electric Furnace which was clocked during a typical day's operation melting bronze for valve castings. Melting time was approximately 30 minutes; charging and pouring time approximately 10 minutes per heat. Over all average power consumption 275 Kw. Hrs. per ton. Records like this are being made in scores of brass and bronze foundries using Detroit Electric Furnaces. They can be duplicated in your own foundry with this fast melting, flexible furnace Write for complete information.

DETROIT ELECTRIC FURNACE DIVISION KUHLMAN ELECTRIC COMPANY . BAY CITY, MICHIGAN tion has been reported which overcome this difficulty.

This method of brazing tools with sver solders has become so satisfactory that at least one company has developed a large scale program of salvaging bruen drills, reamers and other tools by sike soldering them together and putting then back into service. Don't throw broke tools away.

IV—Redesign of Tools:

In the rush of the war productin program there were many plan where a redesign of tools permitte considerable saving in tool steel. For tools have often been made that us an extra large amount of metal, some times of one piece when a two pier job with a shim between would be mon satisfactory. In designing such tools the original shape of the tools is not the only thing of importance, but the amount of metal to be removed in grinding to size and shape should also be considered. It is a discouraging thing to se a form tool that can only be reground once or twice before it has to be dis carded.

This "off-design" is partly the result of old time thinking when the amount of high speed steel used was of minut consideration, and partly the result of the fact that inexperienced "tool design ers" were pressed into service to speed the war effort. A check-up of tool design will often result in a large number cases where high speed steel consumpting can be reduced.

Typical examples are the use of small er tools, which if set close to the won will permit the required rigidity. Ma tools are larger than required. The u of special tool holders or carbon ste supports on tool blocks will permit a # duction in the size tools used in some lathe jobs. A check-up of the design used in boring bars often shows her tools can be used longer, often by ust two or more tools instead of one. It search in designs used for milling of ters will sometimes show an improve shape that may be superior for certajobs, and expansion reamers use metal in the life of the tool than other reamers. Salvage by regrinding won tools such as reamers to a smaller is practiced in many shops, but the hun of war production schedules made preferable in many cases to out new tools than to regrind old ones. L possibilities of such savings should be forgotten now.

V-Surface Preparation:

Several types of special surface pr aration of tools have shown enough white to justify wholesale changes in practi-Improved tool life resulting from the changes have been reported in numero articles.

A-Nitriding. The treatment of here speed steel tools in salt baths containing cyanides at temperatures of about 100-1050° F gives a thin nitride case while is extremely hard and has a low coefficient of friction. Tools treated in mo We are constantly striving to maintain our long established reputation to have available for immediate shipment the most complete line of FINISHED STEEL, principally;

COLD REDUCED STRIP and SHEET STEEL in HIGH and LOW CARBON. HIGH CARBON SPRING WIRES, TEMPERED & ANNEALED. TUBING—both SEAMLESS and WELDED. COLD FINISHED BARS. POLISHED MUSIC SPRING WIRE.

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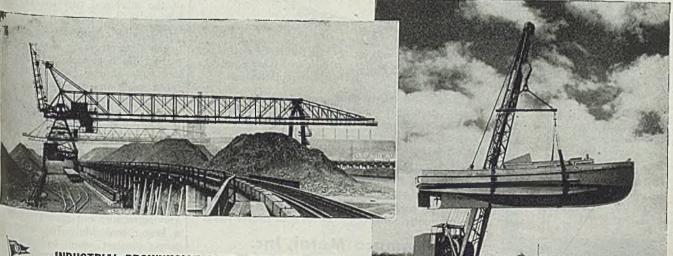
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on the waterfront—or inland—I.B. equipment is doing a top-

riom Atlantic docks to Pacific ports, and at practically every major industrial point in between, industrial Brownhoist Cranes, car dumpers, and coal and ore bridges are speeding production schedules—slashing man hours—with their swift, economical handling of heavy, bulky materials. No matter where or what your material handling problems are -get the facts first from 1.B.

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Below left: I.B. 17-20 Ton Traveling Ore Bridge with 344 ft. bridge span and raisable apron extending 114 ft. from pier leg center line on dock side. Below: This I. B. 40-Ton Diesel Locomotive Crane easily swings an army craft from water to flat car after trial run. Patented Monitor type cab allows operator 360° visibility.





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maintenance men for fast, convenient replacement of bronze bushings and bearings, carry this stock of Ampco Metal solid and hollow bars

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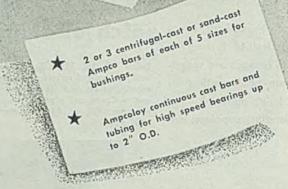
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You can avoid costly delays and tie-ups of machines due to bearing or bushing failure, by having on hand this stock of Ampco bars for fast replacement.

Ampco Metal is a superior aluminum bronze of closely controlled quality, with exceptional wear resistant and bearing characteristics. It lasts several times as long as ordinary bronzes under severe conditions of wear, impact, fatigue, and corrosion.

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Field offices in Principal Cities Specialists in engineering - production - finishing of copper-base alloy parts.

baths usually give noticeable increase tool life. The cost is low and the op eration is simple. This nitriding tra-ment, known by several propriety names, has been used by a number d tool companies for several years but the average machine shop has been shy to take advantage of the savings possible The thickness required is only abc 0.001-in. and it is usually ground e each time the tool is sharpened as should be re-treated. However, and tools as gear cutters, milling cutter hobbing cutters, and taps, which a ground on one face only, may only quire one treatment for the life of t tool. Increases of 100 to 400 per ce in tool life after nitriding have been reported, although the average increase may be less.

B-Chromium Plating. The use d chromium plated tools is less well know but recent reports have shown that on siderable increase is possible in certain cases. The hard chromium plating # only protects the tip of the tool, h the reduced friction is said to keep l tool cooler and decrease cratering.

While best results have been reporte for machining nonferrous metals, co siderable increase in tool life has been found in machining steels. There a numerous publications in the literatur in recent months on this treatment. general this plating also should be newed after each grind, but the co is low, the time of treatment is sh and the operation is not complicate Undersize taps, drills, reamers are som times built up by hard chromium plate

C-Superfinishing of Tools: The rot ground surface of the average tool is the most efficient cutting surface. I proving the finish of the tip of the t by lapping, honing or other metho of improving the polish and the conta of the cutting edge have paid dividen to those who have tried out the metha thoroughly. While actual figures are D always consistent, some reports of to 75 per cent increase in tool life been noted. The improvement in first of the machined part has also create interest in the method.

The value of superfinishing is of P ticular interest since the improvement in tool life is possible regardless of t tool material used. Carbide tools, it speed steels and cast alloy tips all b longer tool life wi'h a highly polisi cutting edge. Superfinishing of tools fore nitriding or chromium plating + shows improvement of tool life.

D-Cold Treatment: The rea publicized treatment whereby tools. chilled to 75-120° F below zero several hours to improve the har and increase the cutting life has show varying results but generally does P a longer tool life. The improvement scems greatest where tools had only rily been given only a single temperi treatment after quenching.

VI-Use of the Tool:

Time spent in studying the best and

for grinding tools is never wasted. Sometimes slight changes in rake, clearance, cutting angle, or angle at the tip of a tool will show that a particular design will give improved results. Even the best machinist will find a particular grind to be preferable to one he used before.

Where designs are made up by a central department the tool designer may not always know the best shape for the tool. Experiment will sometimes show a definite improvement with a slightly rew shape.

Where this has been discovered by a machine operator the new design should be incorporated in the tool drawing. Usually experimentation should be done first on jobs where there is a heavy production of one part or onetype of cut, as these will show the greatest savings in tool life.

Changes in feeds and speeds will often show improvements. For example, on a certain roughing cut, the feed was increased and the speed reduced slightly. The tool ran the same number of hours between grinds but an increase of 30 per cent in metal removed between grinds resulted. In another case the opposite was Ime; a reduced feed and an increased speed tripled the tool life alhough a slight decrease in production rate resulted.

The frequency of regrinds often affects the total length of life of a tool. With carbide tools it is advisable to resharpen as soon as the tool shows signs of becoming dull, but with high speed tools m mughing work a slightly dull tool then works very well. In any case, nowever, sharpening before the tool benomes too dull, will permit less metal to be removed per grind resulting in more regrinds possible before the tool and or becomes too short for use. requently one runs across a machine operator that carries a hone in his pocket and dresses off the tip of a lathe tool frequent intervals. "It increases the number of pieces I can get on a toul grind", he will say.

17-Cutting Fluids:

The choice of the best cutting fluid a difficult tack and each shop has been ideas. Suffice to say that manuaturers' recommendations are the best pades as to type, but that the sulphurred one give best results on the tough alley stels. It must be remembered that net because oil A is best on one job t may not be best on other machines of the other types of cuts.

VII-Salvage:

Don't throw away old tools or broken tak Some can be brazed into good tok Some can be cut up to form new tok Some can be reground to be used as smaller tools. Gather them up and return them to the tool crib, and at regular intervals when a tool-maker is out of a job temporarily put him to took at salvaging them. Salvaged tools are money. In fact, anything that reures your tool costs saves critical alloying metals.

HANDLING+Processing+HANDLING+Assembling+HANDLING + Packing+HANDLING+Storage+HANDLING

HANDLING—the Common Denominator of PRODUCTION



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Human effort increases in direct proportion to size and weight of loads moved by hand. With mechanical handling, no extra manpower is needed as loads get bigger. One man directing power equipment, can, for example, move four times as much, faster and more easily.

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THE BUSINESS TREND Indicators Are Erratic In Adjustment to Peace

VARIOUS industrial barometers are pursuing erratic courses as segments of the nation's economy shrink here and expand there in adjusting to peacetime conditions.

Such performance of the indicators is inevitable while various units of the nation's industrial machine undergo changes in finding their proper relative positions in the peacetime economy. Just as the nation had its growing pains in converting from peace to war it now is having its difficulties, such as labor unrest and unbalanced sup-

plies of materials and components, in reconverting to a peacetime status.

STEEL-The steel ingot production rate, for instance, rose steadily after V-I week until it was affected slightly by labor strife within the steel industry. However, that labor trouble ended and the steel rate resumed its climb, only to be cut severely to its low current level by a coal shortage resulting from a strike of mine supervisory employees. This downward trend in the ingot rate obviously is not a reflection of market demand for steel.

COAL-The coal production rate continues downward too, not because of a lack of demand but because of a widespread strike of miners. In the week ended Oct. 6, bituminous coal output dropped 25 per cent below that of the previous week and 30 per cent under that of a year ago.

AUTOMOBILES-Output of automobiles in the week ended Oct. 13 edged up to 10,175 units from the previous week's low of 9500. Until some settlement is reached on labor's demands for increased takehome pay the automobile production barometer will act erratically.

ELECTRICITY-One indicator, however, that is registering a true trend is production of electricity. Although there have

INDUSTRY

TRADE

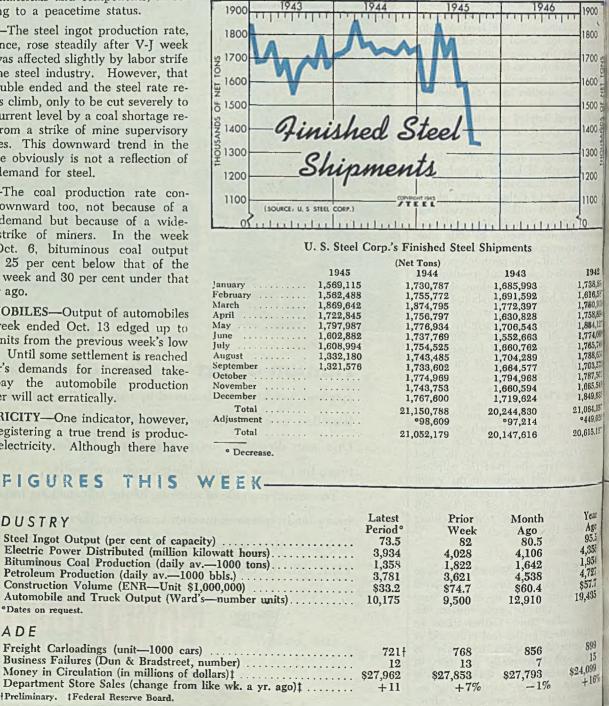
^oDates on request.

-FIGURES THIS

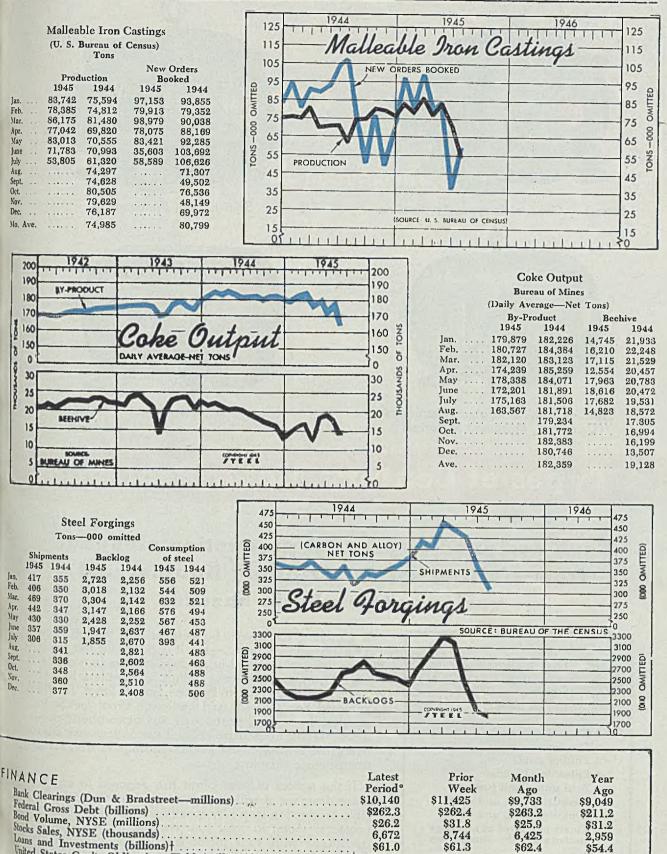
been some fluctuations, the general trend of electricity production has been downward since V-J day when the need for huge amounts of electricity for the nation's colossal way production ended. Now, output per week is about 8 per cent less than in the week preceding V-J day.

TRADE-Savings accumulated from war work and a pentup demand for war-scarce commodities whose supply i now increasing are causing weekly department store sale to run ahead of last year. In the week ended Oct. 6, sale were 11 per cent greater than in the corresponding week a year ago, and the four-week moving average on Oct. was 10 per cent above the same period of 1944.

COKE-Production of coke in August was 7.5 per cent under that of July. Both by-product and beehive output showed declines, with the latter showing a greater percentage of decline.



THE BUSINESS TREND



Mumber banks, Federal Reserve System.	\$45,143	\$45,140	\$46,182	\$40,506
PRICES				
STEEL's composite finished steel price average All Commodities; Industrial Raw Materials; Manufactured Products; IBureau of Labor Statistics Index, 1926=100.	100.2	\$58.27 105.0 115.7 101.8	\$58.27 105.0 115.3 102.0	\$56.73 103.9 113.7 101.2

\$61.0

\$61.3

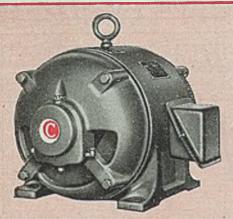
\$45,140

\$62.4

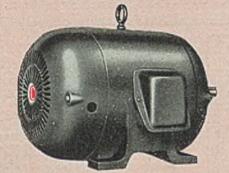
\$46.182

\$54.4

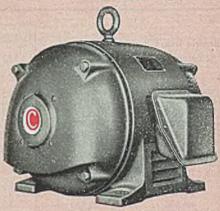
\$40,500



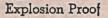
Form J -- General Purpose Application



TEFC — Protects Against Destructive Dust, Grit, Powdered Materials



Splash Proof Protection



4 Types of Century Motor Protection

Each designed to prevent production stoppage from—falling solids, dripping liquids, and various atmospheric hazards

One of these four types of Century motors will provide protection against one or more of these conditions in your plant.

- Normal surroundings
- Dampness

OTORS

- Falling solids
- Splashing liquids
- Acid and alkali fumes
- Destructive grit and dust
- Explosive dusts and gases
- Finely powdered or explosive materials in the atmosphere

Matching the motor characteristics to the job to be done is important—but it is only half the job if there are unusual and hazardous surrounding atmospheric conditions. Century offers a complete line of Open Protected General Purpose, Splash Proof, Totally Enclosed Fan Cooled, and Explosion Proof motors to meet the hazards of practically any atmospheric condition. When necessary, special insulations are also available to protect the motor windings in abnormal atmospheric surroundings.

If the motors in your plant are exposed to any of these dangers, it will pay you to guard against possible production losses by specifying the right Century protected motor to meet your conditions. If you want assistance with your motor application problem, a Century engineer will be glad to put his experience at your disposal. Call him in.

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Contary

NO WONDER

M-H Rolls break performance records

M-H knows rolling mills—like no one else

Of course, Mack-Hemp knows rolls, *loo*. They have originated most of the major roll developments of the United States—but equally important they know mills—*intimately*. As a matter of fact, there are more M-H blooming mills now in operation than all other makes put together. What does all this mean? It means just this—that Mack-Hemp knows exactly which type of roll will do each particular job best. And they also know how to build that particular roll better . . . The importance of this experience may be judged by the fact that M-H Alloy Steel Blooming Mill Rolls are breaking tonnage records in at least 7 different plants.

Mackintosh - Hemphill Company, Pittsburgh & Midland, Pa

TWO FAMOUS NAMES POOL 134 YEARS OF EXPERIENCE

Announcing the consolidation of Hewill and Robins

to offer you the only complete materials handling service in America

BECAUSE any belt conveyor system consists primarily of two main units-a BELT to carry the load, and a MECHANISM to move the beltthe engineering of these two vital units requires the closest kind of cooperation between equipment designer and belt manufacturer.

That is the kind of cooperation that produces the best results for you. Therefore, it is only natural that HEWITT, a name backed by 85 years

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quality rubber products for industry for 85 years. Precision-built, **JOB-ENGINEERED** conveyor belts for half a century.

from ROBINS

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the finest JOB-ENGINEERED materials handling machinery for 49 years.

in producing quality rubber products . . . and ROBINS, a name pre-eminent in the field of materials handling machinery for 49 years ... should combine their 134 years of industrial ex perience. By combining their efforts . . . poolin. their research . . . merging their resources and distribution facilities, they can offer you the only complete job-engineered materials handling service in America.

> now, from HEWITT and ROBINS the only complete JOB-ENGINEERED materials handling service in America.

EWITT RUBBER of Buffall

ROBINS CONVEYORS INCORPORATED. Passaic, N. J. /TEEL

MARKET SUMMARY

Coal Strike End Leaves Steel Mill Load Heavy

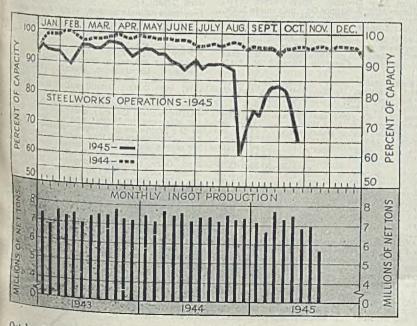
Time needed to regain good production rate . . . Deliveries further extended by low output . . . Pig iron output cut deeply

ALTHOUGH striking soft coal miners are scheduled to retum to work Oct. 22 it may be two weeks or more before steel production begins to show appreciable recovery, due principally to the time required to get coal moving to steel plants and to get cold ovens ready for coke production.

Action ending the strike came when steel production had dropped to about 65 per cent of capacity and would have undergone another sharp cut within a few days. As a result of this breathing spell in the soft coal controversy, steel demand has taken a renewed spurt, only to find many producers still unable to offer definite delivery promises in certain products, such as sheets and carbon bars, in which some sellers are completely out of the market for some time on the more popular grades.

Recent curtailment in steel production, principally because of the soft coal dispute, has thrown producers further behind on current commitments than at any time in months. This, combined with as high demand as prevailed before the coal strike, had led to further extension of deliveries on various products. Hot-rolled pickled and cold-rolled sheet deliveries run late into second quarter next year, with galvanized and slicon sheets in practically the same position. Plain hot-rolled, however, can be had early in first quarter, at least early in February.

Last week the estimated national rate of steel production reached 65 per cent of capacity because of coal shortage, nearly buching the low of 60 per cent in the week of V-J Day. Pittsburgh dropped 13 points to 49 per cent, Chicago 13 points to ⁷³, Buffalo 25½ points to 60½, Youngstown 3 points to 47, eastern Pennsylvania 4 points to 71, Wheeling 4 points to 84,



Percentage o in	Leading	Capacity Districts	Engag	ged
	Week		C	
	Oct. 20	Change	Same 1944	
Pittsburgh	49	-13	92	101
Chioago		-13		
Eastern Pa	71	- 4	93	95
Youngstown		- 3	88	98
Wheeling	84	- 4	92	101
Cleveland	80.5	-1.5	95.5	
Buffalo		-25.5	88.5	
Birmingham		None	90	67
New England		- 3	92	95
Cincinnati	71	- 6	84	90
St. Louis	68	None	75	90.5
Detroit		None	84	87
	3-1-1			01
Estimated nationa	al			
rate	65	8.5	96.5	99.5
		capacities		

Cincinnati 6 points to 71, Cleveland 1½ points to 80½ and New England 3 points to 79. Rates were unchanged at Detroit, 84 per cent, St. Louis 68 and Birmingham 95.

As a result of coal shortage and deep cuts in coke production pig iron output has been reduced heavily and producers have been careful in its distribution, shipping to foundries which had coke supplies with which to melt. No severe distress has resulted from the shortage as labor is still in too small supply to allow full foundry operation.

Scrap has gained added strength recently as heavier demands were made on it to replace pig iron in many cases. Ceiling prices prevail and full springboards are paid in most instances. No winter reserves are being accumulated by most melters and the situation is far from comfortable. Some war steel is being released, notably landing mat steel, which commands top price.

Structural steel demand continues heavy and mill schedules are filled into next year in most cases. Tonnage would be much heavier if fabricators could figure all the business offered. Lack of estimators and draftsmen causes much delay.

Railroads are in the market for new equipment and streamlined trains are being placed. The Missouri-Kansas-Texas and St. Louis-San Francisco have placed two 12-car stainless steel streamlined trains and dieselelectric locomotives and the Western Pacific, Denver & Rio Grande Western and Chicago, Burlington & Quincy have placed a joint contract for six ten-car stainless steel streamlined trains for Chicago to San Francisco service.

Further spread of the basing point extension came last week when Carnegie-Illinois Steel Corp. set up Youngstown as a base for hot-rolled carbon steel bars and small shapes, alloy hot-rolled bars and spring steel flats, alloy bar strip and alloy strip. This company also has made Pittsburgh a basing point for ferromanganese and Pittsburgh and Chicago for spiegeleisen.

Average composite prices of steel and iron products are unchanged, ceiling prices ruling.

COMPOSITE MARKET AVERAGES

and the second			1. T	Month Ago	Months Ago	Year Ago	Years Ago
at the base of the	Oct. 20	Oct. 13	Oct 6	Sept., 1945	July, 1945	Oct., 1944	Oct., 1940
Finished Steel	\$58.27	\$58.27	\$58.27	\$58.27	\$58.27	\$56.73	\$56.73
Semifinished Steel	37.80	37.80	37.80	37.80	37.80	36.00	36.00
Steelmaking Pig Iron	24.05	24.05	24.05	24.05	24.05	23.05	22.05
Steelmaking Scrap	19.17	19.17	19.17	19.17	19.17	16.50	20.20

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, Chic ago. Cleveland, Neville Island, Granite City and Youngstown. Steelwook Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsb urgh, Chicago and eastern Pennsylvania. Finished steel, net tons; othe, gross tons.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for last Month, Three Months and One Year Ago

Finished Material Steel bars, Pittsburgh Steel bars, Chicago Shapes, Pittsburgh Shapes, Pittsburgh Shapes, Chicago Plates, Pittsburgh Plates, Pittsburgh Plates, Chicago Sheets, hot-rolled, Pittsburgh Sheets, hot-rolled, Pittsburgh Sheets, No. 24 galv., Pittsburgh Sheets, No. 24 galv., Cary	$\begin{array}{c} 1 \forall 45 \\ 2.25c \\ 2.57 \\ 2.257 \\ 2.257 \\ 2.210 \\ 2.215 \\ 2.210 \\ 2.215 \\ 2.215 \\ 2.25 \\ 2.25 \\ 2.25 \\ 2.25 \\ 2.25 \\ 2.25 \\ 2.20 \\ 2.20 \\ 2.20 \\ 2.20 \\ 2.20 \\ 2.20 \\ 2.20 \\ 2.20 \\ 3.05 \\ 3.70 \\$	945 19- .25c 2. .57 2. .25 2. .10 2. .215 2. .10 2. .25 2. .30 2. .25 2. .30 2. .25 2. .30 2. .20 3. .20 3. .70 3. .20 3.	$\begin{array}{rrrr} 25c & 2.15c \\ 57 & 2.47 \\ 25 & 2.15 \\ 10 & 2.10 \\ 215 & 2.215 \\ 10 & 2.5 \\ 2.10 \\ 25 & 2.10 \\ 25 & 2.10 \\ 20 & 2.15 \\ 25 & 2.10 \\ 20 & 2.10 \\ 20 & 2.10 \\ 20 & 2.10 \\ 20 & 2.10 \\ 20 & 2.10 \\ 20 & 2.5 \\ 10 & 3.55 \\ 70 & 3.55 \\ 10 & 3.55 \\$	Pig Iron Bessemer, del. Pittsburgh Basic, Valley Basic, eastern del. Philadelphia No. 2 fdry., del. Pitts., N.&S. Sides No. 2 foundry, Chicago Southern No. 2, Birmingham Southern No. 2, Birmingham Southern No. 2 del. Cincinnati No. 2 fdry. del. Philadelphia Malleable, Valley Malleable, Chicago Lake Sup., charconl del. Chicago Gray forge, del. Pittsburgh Ferromanganese, del. Pittsburgh	$\begin{array}{c} 24.50\\ 26.34\\ 25.69\\ 25.00\\ 21.38\\ 25.80\\ 26.84\\ 25.00\\ 26.84\\ 25.00\\ 25.00\\ 37.34\\ 25.19\end{array}$	Sept., 1945 \$26.19 26.34 25.69 25.00 21.38 25.30 26.84 25.30 26.84 25.30 26.84 25.00 25.00 37.34 25.19 140.33	July, 1945 \$26.19 24.50 26.34 25.69 25.00 21.38 25.30 26.84 25.00 25.00 25.00 25.00 25.00 25.00 140.33	Oct., 1944 \$25.19 23.50 24.69 24.69 24.69 24.89 25.84 24.89 25.84 24.80 25.84 24.00 37.84 24.19 140.33
Bright bess., basic wire, Pittsburgh Tin plate, per base box, Pittsburgh Wire nails. Pittsburgh	. \$5.00 \$5	5.00 \$5.	75 2.60 00 \$5.00 90 2.55	Scrap Heavy melting steel, No. 1 Pittsburg Heavy melt. steel, No. 2, E. Pa. Heavy melting steel, Chicago Rails for rolling, Chicago No. 1 cast, Chicago	$\begin{array}{c} 18.75 \\ 18.75 \\ 22.25 \end{array}$	\$20.00 18.75 18.75 22.25 20.00	\$20.00 18.45 18.75 22.25 20.00	\$16.95 14.50 17.50 22.25 20.00

Semitinisned Material

Sheet bars, Pittsburgh, Chicago \$36.00	\$36.00	\$36.00	\$34.00	
Slabs, Fittsburgh, Chicago	36.00	36.00	34.00	C
Rerolling billets, Pittsburgh	36.00	36.00	34.00	C
Wire rods, No. 5 to 31-inch, Pitts, 2.15	2.15	2.15	2.00	C

Coke \$7.00 7.75 13.55 Connellsville, furnace, ovens Connellsville, foundry ovens Chicago, by-product fdry., del. \$7.50 8.25 13.35 \$7.50 8.25 \$7.50 8.25 13.75 13.35

STEEL, IRON RAW MATERIAL, FUEL AND METALS PRICES

Following are maximum prices established by OPA Schedule No. 6 issued April 16, 1941, revised June 20, 1941, Feb. 4, 1942 and May 21 1945. The schedule covers all iron or steel ingots, all semifinished iron or steel products, all finished hot-rolled, cold-rolled iron or steel product and any iron or steel product which is further finished by galvanizing, plating, coating, drawing, extruding, etc., although only principal stablished be asing points for selected products are named specifically. Seconds and off-grade products are also covered. Exceptions applying to individu companies are noted in the table. Finished steel quoted in cents per pound.

Semifinished Steel

Gross ton basis except wire rods, skelp. Garbon Steel Ingots: F.o.b. mill base, rerolling qual., stand. analysis, \$31.00. (Empire Sheet & Tin Plate Co., Mansfield, O. may quote carbon steel ingots at \$33 gross ton, f.o.b. mill Kaiser Co. Inc., \$43, f.o.b. Pacific ports.)

Alloy Steel Ingots: Pittsburgh. Chicago, Buffa-lo, Bethlehem, Canton, Massillon; uncrop, \$45. Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, \$36; Detroit, del. \$38; Duluth (bil) \$38; Pac. Ports, (bil) \$48. (Andrews Steel Co., carbon slabs \$41; Continental Steel Corp., billets \$34, Kokomo, to Acme Steel Co.; Northwestern Steel & Wire Co., \$41, Sterling, III; Laclede Steel Co., \$34 Alton or Madison, Ill.; Wheeling Steel Corp. \$36 base, billets for lend-lease, \$34, Ports-mouth, O., on slabs on WPB directives, Gram-ite City Steel Co. \$47.50 gross ton slabs from D.P.C. mill. Geneva Steel Co., Kaiser Co. Inc., \$58.64, Pac. ports.) Forging Quality Blooms, Stabs, Billets: Pitts-Alloy Steel Ingots: Pittsburgh, Chicago, Buffa

\$55.64, Pac. ports.)
Forging Quality Blooms, Slabs, Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, \$42. Detroit, del. \$44; Dutuh, billets, \$44; forg. bil. f.o.b. Pac. ports, \$54.
(Andrews Steel Co. may quote carbon forging billets \$50 gross ton at established basing points; Follansbee Steel Corp., \$49.50 f.o.b. Toronto, O. Geneva Steel Co., Kalser Co. Inc., \$64.64, Pacific ports.)
Open Hearth Shell Steel: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Youngstown, Birmingham, base 1000 tons one size and section; 3-12 in., \$52; 12-18 in., excl., \$54.00; 18-in. and over \$56. Add \$2.00 del. Detroit; \$3.00 del. Eastern Mich. (Kalser Co. Inc., \$76.64, f.o.b. Los Angeles.)
Jonen Heits, Slabs, Bloons: Pittsburgh, Chi-

I.o.b. Los Angeles.)
Alloy Billets, Slabs, Blooms: Pittsburgh, Chi-cago, Bulfalo, Bethlehem, Canton, Massillon, S54, del. Detrolt S56, Eastern Mich. S57.
Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Polat, Youngstown, S36. (Wheeling Steel Corp. \$37 on lend-lease sheet bars, S38 Portsmouth, O., on WPB di-rectives; Empire Sheet & Tin Plate Co., Mans-field, O., carbon sheet bars, \$39, f.o.b. mill.)
Sheep: Pittsburgh, Chicago, Sparrows Polnt, Youngstown, Coatesville, lb., 1.90c.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, $5-\frac{1}{3^2}$ in inclusive, per 100 lbs., \$2.15 Do., over $\frac{1}{3^2}-\frac{1}{3^2}$ in, incl., \$2.30; Galveston, base, 2.25c and 2.40c, respectively. Worcester add \$0.10; Pacific ports \$0.50 (Pitts-burgh Steel Co., \$0.20 higher.)

Bars

Bars Hot-Rolled Carbon Bars and Bar-Size Shapes under 3: Pittsburgh, Chicago, Gary, Cleve-land, Butfalo, Birmingham base 20 tons one size, 2.25c; Duluh, base 2.35c; Younstown, base, 2.275c; Detroit, del, 2.35c; Eastern Mich, 2.40c; New York del, 2.59c; Phila, del, 2.57c; Gulf Ports, dock 2.62c; Pac, ports, dock 2.90c, (Calumet Steel Division, Borg-Warner Corp., and Joslyn Mfg, & Supply Co., may quote 2.35c, Chicago base; Sheffield Steel Corp., 2.75c, f.o.b. St. Louis.) Ball Steel Bars: Same prices as for hot-rolled

Rail Steel Bars: Same prices as for hot-rolled carbon bars except base is 5 tons. (Sweet's Steel Co., Williamsport, Pa., may quote rail steel merchant bars 2.33c f.o.b. mill.)

Hui,) Hot-Rolled Alloy Bars: Pittsburgh, Chicago, Canton, Massillon. Buffalo, Bethlehem, base 20 tons one size, 2.70c; Youngstown, base, 2.725c; Detroit, del., 2.80c. (Texas Steel Co. may use Chicago base price as maximum f.o.b. Fort Worth, Tex., price on sales outside Texas, Oklahoma.) AISI (°Basic AISI (°Basic

AISI			(°Basic
Series	O-H)	Series	O-H)
1300	\$0.10	4100	(.1525 Mo) 0.70
			(.2030 Mo) 0.75
2300	1.70	4300	1.70
2500	2.55	4600	1.20
3000	0.50	4800	
3100	0.85	5100	
3200	1.35	5130	or 5152 0.45
3400	3.20	6120	or 6152 0.95
4000	0.45-0.55	6145	or 6150 1.20

[•]Add 0.25 for acld open-hearth; 0.50 electric. Cold-Finished Carbon Bars: Pittsburgh, Chi-cago, Gary, Cleveland, Buffalo, base 20,000-39,999 lbs., 2.75c; Detroit 2.80c; Toledo 2.90c. (Keystone Drawn Steel Co. may sell outside its usual market area on Proc. Div., Treasury Dept. contracts at 2.65c, Spring City, Pa., plus Ireight on hot-rolled bars from Pittsburgh to Spring City, New England Drawn Steel Co. may sell outside New England on WPB direc-

tives at 2,65c, Mansfield, Mass., plus freiz-on hot-rolled bars from Buffalo to Mansfeld Cold-Finished Alloy Bars: Pittsburgh, Chica-Gary, Cleveland, Buffalo, base 3.35c; Detre. del. 3.45c; Eastern Mich. 3.50c.

Reinforcing Bars (New Billet): Pittsbur-Chicago, Gary, Cleveland, Birmingham, Su-rows Point, Buffalo, Youngstown, base 2,30. Detroit del. 2.25c; Eastern Mich. and Tofwy 2.30c; Guif ports, dock 2.50c; Pacific para dock 2.55c.

Reinforcing Bars (Rail Steel): Pittsburgh. C. cago, Gary, Cleveland, Birmingham, Yours town, Buffalo base 2.15c; Detroit, del. 225-Eastern Mich. and Toledo 2.30c; Gulf ports dock 2.50c Eastern Mi dock 2.50c.

Iron Bars: Single refined, Pitts. 4.40c; double refined 5.40c; Pittsburgh, staybolt, 5.75c; Ten Haute, single ref., 5.00, double ref., 6.25c.

Sheets, Strip

<text>

ITEEL (

Enamellur Sheets: 10-garge; Pittsburgh, Chi-esso, Gary, Cleveland, Youngstown, Middle-town, base 2.85c; Granite City, base 2.95c; Datoit, del. 2.95c; eastern, Mich. 3.00c; Pa-che ports 3.50c; 20-garge; Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base 3.45c; Detroit del. 3.55c; eastern Mich. 3.60c; Pacific ports 4.10c. Electrical Sheets No. 24: Pittsburgh, Pacific, Cranita,

Pli Field grade Armature Electrical Motor Dynamo Transforuner	3.65c 4.15c 5.05c	Pacific Ports 4.05c 4.40c 4.90c 5.80c 6.50c	Granite City 3.30c 3.75c 4.25c 5.15c 5.85c
72	7.25c	7.00c 8.00c 8.50c	

Tin, Terne Plase

Tin, Terne Piate Tin, Terne Piate Tin Pate: Pittsburgh, Chicago, Gary, 100-lb. has box, 55.00; Granite City \$5.10. Electrohyste Tin Plate: Pittsburgh, Gary, 100-h base box, 0.25 lb. tin, \$4.35; 0.50 lb. tin, \$4.50; 0.75 lb. tin \$4.65; Granite City, \$4.45, \$4.60; 0.75 lb. tin \$4.65; Granite City, \$4.45, \$4.60; 3.75, respectively The Mill Back Plate: Pittsburgh, Chicago, Gary, base 29 gage and lighter, 3.05c; Granite City, 3.15c; Pacific ports, boxed, 4.05c. Loag Ternes: Pittsburgh, Chicago, Gary, No. 4 waassried 3.80c; Pacific ports 4.55c. Mandactoring Ternes: (Special Coated) Pitts-burgh, Chicago, Gary, 100-base box \$4.30; Granite City \$4.40. Loodar Ternes: Pittsburgh base per pack-are 112 sheets; 20 x 28 in., coating I.C. 8-lb. \$12.00, 15-lb. \$14.00; 20-lb. \$15.00; 25-lb. \$16; 30-lb. \$17.25; 40-lb. \$19.50. Plates

Plates Caton Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sarows Point, Coatesville, Claymont, 2.25c; New York, del. 2.44c; Phila., del. 2.30c; New York, del. 2.44c; Phila., del. 2.57-82c; Pacific point 2.80c; Gulf ports, 2.60c. Graine City Steel Co. may quote carbon plate 3.25c f.o.b. mill; 2.65c f.o.b. Los Angeles. Central For Heater Co., Provo, Utah, 3.20c, Lob, Fat. ports.) Foor Plates: Pittsburgh, Chicago, 3.50c; Fache poits, 4.15c; Gulf ports, 3.85c. Own-Harth Alloy Pintes: Pittsburgh, Chi-rada, Coalesville, 3.50c; Gulf ports, 3.95c; Pacific poits, 4.15c; Wireach Iron Plates: Pittsburgh, 4.30c. Shapes

Shapes

Shapes Shugani Shapes: Pittsburgh, Chicago, Gary, Brungham, Buttalo, Bethlehem, 2.10c; New York, del. 2.215c; Paclfic Property 27c; Phila., del. 2.215c; Paclfic Property 27c; Ouif ports, 2.45c. Property Iron Co., Phoenixville, Pa., may use carbon steel shapes at 2.35c at estab-shed basing points and 2.50c, Phoenixville, a export; Sheffield Steel Corp., 2.55c f.o.b. K. Luis, Genera Steel Co., 3.25c, Pac. ports; Giser Co. Inc., 3.20c f.o.b. Los Angeles). Hing

hisburgh, Chicago, Buffalo 2.40; Pacific ports,

Wire Products, Nails

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 from pipe. Buit Weld

Tron 3½ 10 16 1-114 34 38 11/2..... 181/2 371/ 18 Iron
 Steel
 Blk.
 Galv.

 61
 491/2
 64
 64
 541/2
 66
 541/2
 66
 541/2
 65
 521/2
 644/2
 52
 631/2
 51

				-Lap	weid-
			nless-		Char-
O.D		Hot	Cold		coal
Sizes	B.W.G	Rolled	Drawn	Steel	Iron
1"	. 13	\$ 7.82	\$ 9.01		
11/4"	13	9.26	10.67		
$\frac{11/2}{1.54}$ "	. 13	10.23	11.72	\$ 9.72	\$23.71
157"	. 13	11.64	13.42	11.06	22.93
2" 2¼"	. 13	13.04	15.03	12.38	19.35
21/4 "	. 13	14.54	16.76	13.79	21.63
21/4 "	12	16.01	18.45	15.16	21.00
21/4"	. 12	17.54	20.21	16.58	26.57
251"	- 12	18.59	21.42	17.54	29.00
3"	12	19.50	22.48	18.35	31.38
31/2"		24.63	28.37	23.15	
4"	. 10	30.54			39.81
			35.20	28.66	49.90
41/4," 5"	. 10	37.35	43.04	35.22	
	. 9	46.87	54.01	44.25	73.93
6"	. 7	71.96	82.93	68.14	

Rails, Supplies

Standard rails, over 60-lb., f.o.b. mill, gross ton, \$43.00. Light rails (billet), Pittsburgh, Chicago, Birmingham, gross ton, \$45.00. *Relaying rails, 35 lbs. and over, f.o.b. rail-road and basing points, \$31-\$33. Supplies: Track bolts, 4.75c; heat treated, 5.00c. Tie plates \$46 net ton, base, Standard spikes, 3.25c.

*Fixed by OPA Schedule No. 46, Dec. 15, 1941.

Tool Steels

TI 18 1

Tung	Chr.	Van.	Moly.	Base, per lb.
18.00	4	1	10000	67.00c
1.5	4	1	8.5	54.00c
	4	2	8	54.00c
6.40	4.15	1.90	5	57.50c
5.50	4.50	4	4.50	70.00c

Stainless Steels

Base, Cents per lb. CHROMIUM NICKEL STEEL

Onno.n.	TOUT 14	ICKEL	STEEL	1.1	
cn		And in the lot		H. R.	C. R.
Туре	Bars	Plates	Sheets	Strip	Strip
302	24.00c	27.00c	34.00c	21.50c	28.00c
303	26.00	29.00	36.00	27.00	33.00
304	25.00	29.00	36.00	23 50	30.00
308	29.00	34.00	41.00	28,50	35.00
309	36.00	40.00	47.00	37.00	47.00
310	49.00	52.00	53.00	48.75	56.00
312	36.00	40.00	49.00		
*316	40.00	44.00	48.00	40.00	48.00
†321	29.00	34.00	41.00	29.25	38.00
\$347	33.00	38.00	45.00	33.00	42.00
431	19.00	22.00	29.00	17.50	22.50
STRAIG	HT CHI	COMIUM	I STEEL		22.00
403	21.50	24.50	29.50	21.25	27.00
**410	18.50	21.50	26.50	17.00	22.00
416	19.00	22,00	27.00	18.25	23.50
f + 420	24.00	28.50	33.50	23.75	36.50
430 .	19.00	22.00	29.00	17.50	22.50
11430F.	19.50	22,50	29.50	18.75	24.50
440A.	24.00	28.50	33.50	23.75	36.50
442	22.50	25.50	32.50	24.00	32.00
443	22.50	25.50	32.50	24.00	32.00
446.	27.50	30.50	36.50	35.00	52.00
501	8.00	12.00	15.75	12.00	17.00
502.	9.00	13.00	16.75	13.00	18.00
STAINTT					10.00

STAINLESS CLAD STEEL (20%) 304... \$\$18.00 19.00

*With 2-3% moly. ‡With titanium. †With columbium. **Plus machining agent. †‡High carbon. ‡‡Free machining. §§Includes anneal-ing and pickling.

Rivets, Washers F.o.b. Pittsburgh, Cleveland, Chicago Birmingham

Structural 3.75c

Bolts, Nuts

charged.

basing point price pus all-rail freight may be charged. D.mestic Celling prices are the aggregate of (1) governing basing point price, (2) extras-and (3) transportation charges to the point of delivery as customarily computed. Govern-ing basing point is basing point nearest the consumer providing the lowest delivered price. S. conds, maximum prices: flat-rolled rejects 75% of prime prices, wasters 75%, waste-wasters 65% except plates, which take waster prices: lin plate \$2.80 per 100 lbs.; terne plate \$2.25; semifinished 85% of primes; other grades limited to new material cellings. Export celling prices may be either the ag-gregate of (1) governing basing point or emer-port transportation charges provided they are the 1.a.s. seaboard quotations of the U. S. Steel Export Co. on April 16, 1941.

Metallurgical Coke

Price Per Net Ton

Bechive Ovens	
Connellsville, furnace	*7.50
Conneilsville, foundry	8.00- 8.50
New River, foundry	9.00- 9.25
Wise county, foundry	7.75- 8.25
Wise county, furnace	7.25- 7.75
By-Product Foundry	
Kearney, N. J., ovens	13.05
Chicago, outside delivered	13.00
Chicago, delivered	13.75
Terre Haute, delivered	13.50
Milwaukee, ovens	13.75
New England, delivered	14.65
St. Louis, delivered	+13.75
Birmingham, delivered	10.90
indianapolis, delivered	13.50
Cincinnati, delivered	13.25
Cleveland, delivered	13.20
Bullalo, delivered	13.40
Detroit, delivered	13.75
Philadelphia, delivered	13.28
	-00

"Operators of hand-drawn ovens using trucked coal may charge \$8.00; effective May 26, 1945. †14.25 from other than Ala., Mo., Tenn.

Coke By-Products

Spot, gal., freight allowed east of	Omaĥa
Fure and 90% benzol	15 000
TOILOL TWO degree	28 000
Solvent naphina	27 000
industrial XVIOI	27.00c
Per lb. f.o.b. works	
Phenol (car lots, returnable drums)	12.50c
Do., less than car lots	13.25c
Do., tank cars	11,50c
Eastern Plants, per lb.	
Naphthalene flakes, balls, bbls., to job-	11-1-2
bers Per ton, bulk, f.o.b. port	8.00c
rei ton, buik, 1.0.b. port	

Sulphate of ammonia\$29.20

WARFHOUSE STEEL PRICES

Base delivered price, cents per pound, for delivery within switching limits, subject to established extras.

	ed bar	Structural shapes	Plates	Floo: plates	Hot rolled sheets (10 gage base)	Hot rollsd bands (12 gage and heavier)	Hot rolled hoops (14 gage and lighter)	Galvanized flat sheels (24 gage base)	Cold-rolled sheets (17 gage base)	Cold finished bars	Cold-rolled strip	NE hot bars 8600 series	NR hot lates
Boston New York Jersey City Philadelphia Baltimore	$\begin{array}{r} 4.044^1\\ 3.853^1\\ 3.853^1\\ 3.822^1\\ 3.802^1\end{array}$	3.912^{1} 3.758^{1} 3.747^{1} 3.666^{1} 3.759^{1}	$\begin{array}{c} 3.912^{1}\\ 3.768^{1}\\ 3.768^{1}\\ 3.605^{1}\\ 3.594^{1} \end{array}$	$\begin{array}{c} 5.727^1 \\ 5.574^1 \\ 5.574^1 \\ 5.272^1 \\ 5.252^1 \\ 5.252^1 \end{array}$	3.774^{1} 3.590^{1} 3.590^{1} 3.518^{1} 3.394^{1}	$\begin{array}{c} 4.106^1 \\ 3.974^1 \\ 3.974^1 \\ 3.922^1 \\ 3.902^1 \end{array}$	$5.106^{1} \\ 3.974^{1} \\ 3.974^{1} \\ 4.272^{1} \\ 4.252^{1} \\ \end{array}$	$\begin{array}{c} 5.224^{14} \\ 5.010^{12} \\ 5.010^{12} \\ 5.018^{15} \\ 4.894^{1} \end{array}$	$\begin{array}{r} 4.744^{14} \\ 4.613^{14} \\ 4.613^{14} \\ 4.872^{25} \\ 4.852^{26} \end{array}$	$\begin{array}{r} 4.244^{11} \\ 4.203^{21} \\ 4.203^{21} \\ 4.172^{21} \\ 4.152^{21} \end{array}$	4.715 4.774 4.774 4.772		6.012 5.8P
Washington Norfolk, Va. Bethlehem, Pa. ^o Claymont, Del ^o Coatesville, Pa. ^o	3.941 ¹ 4.065 ¹	3.930^{1} 4.002^{1} 3.45^{1}	3.796^{1} 3.971^{1} 3.45^{1} 3.45^{1}	5.341 ¹ 5.465 ¹	3.596 ¹ 3.771 ¹	4.041 ¹ 4.165 ¹	4.391 ¹ 4.515 ¹	5.196 ¹⁷ 5.371 ¹¹	4:841 ²⁰ 4.965 ²⁴	4.141 ²¹ 4.265 ²¹	·····	····· ····· ·····	
Buffalo (city) Buffalo (country) Pittsburgh (city) Pittsburgh (country) Cleveland (city)	$\begin{array}{c} 3.35^{1}\\ 3.25^{1}\\ 3.35^{1}\\ 3.25^{1}\\ 3.25^{1}\\ 3.35^{1}\end{array}$	$\begin{array}{c} 3.40^{1} \\ 3.30^{1} \\ 3.40^{1} \\ 3.30^{1} \\ 3.588^{1} \end{array}$	$\begin{array}{r} 3.63^{1} \\ 3.30^{1} \\ 3.40^{1} \\ 3.30^{1} \\ 3.40^{1} \end{array}.$	5.26^{1} 4.90^{1} 5.00^{1} 4.90^{1} 5.188^{1}	3.35^{1} 3.25^{1} 3.35^{1} 3.25^{1} 3.35^{1}	$\begin{array}{c} 3.819^{1} \\ 3.81^{1} \\ 3.60^{1} \\ 3.50^{1} \\ 3.60^{1} \end{array}$	3.819^{1} 3.50^{1} 3.60^{1} 3.50^{1} 3.60^{1}	$\begin{array}{r} 4.75^{15} \\ 4.65^{15} \\ 4.75^{12} \\ 4.65^{12} \\ 4.877^{12} \end{array}$	4.40 ¹⁰ 4.30 ¹⁰ 4.40 ³⁴ 4.30 ³⁴ 4.40 ³⁴	$\begin{array}{c} 3.85^{21} \\ 3.75^{21} \\ 3.85^{21} \\ 3.75^{21} \\ 3.85^{21} \\ 3.85^{21} \end{array}$	4.669 4.35 4.45 ²¹	5.60 ²² 5.60 ²³ 5.60 ²³	5.75 5.75 5.65
Cleveland (country) Detroit Omaha (city, delivered) Omaha (country, base) Cincinnati	3.25^{1} 3.450^{1} 4.115^{1} 4.015^{1} 3.611^{1}	3.661^{1} 4.165^{1} 4.065^{1} 3.691^{1}	3.30^{1} 3.609^{1} 4.165^{1} 4.065^{1} 3.661^{1}	5.281^{1} 5.765^{1} 5.665^{1} 5.291^{1}	$\begin{array}{r} 3.25^{1} \\ 3.450^{1} \\ 3.865^{1} \\ 3.765^{1} \\ 3.425^{1} \end{array}$	$\begin{array}{r} 3.50^{1} \\ 3.700^{1} \\ 4.215^{1} \\ 4.115^{1} \\ 3.675^{1} \end{array}$	$\begin{array}{r} 3.50^{1} \\ 3.700^{1} \\ 4.215^{1} \\ 4.115^{1} \\ 3.675^{1} \end{array}$	5.000 ¹² 5.608 ¹⁹ 5.508 ¹⁹ 4.825 ¹²	4.30 ²⁴ 4.500 ²⁴ 5.443 ²⁴ 4.475 ²⁴	$\begin{array}{c} 3.75^{24} \\ 3.900^{23} \\ 4.543^{12} \\ 4.111^{24} \end{array}$	4.35 ²¹ 4.659 4.711	5.93 ²³ 6.10	5.95
Youngstown, O.° Middletown, O.° Chicago (city) Milwaukee Indianapolis	3.50 ¹ 3.637 ¹ 3.58 ¹	3.55^{1} 3.687^{1} 3.63^{1}	3.55^{1} 3.687^{1} 3.63^{1}	5.15^{1} 5.287^{1} 5.23^{1}	3.25 ¹ 3.25 ¹ 3.387 ¹ 3.518 ¹	3.50^{i} 3.60^{1} 3.737^{1} 3.768^{1}	3.50^{1} 3.60^{1} 8.737^{1} 3.768^{1}	$\begin{array}{r} 4.40^{13} \\ 4.65^{10} \\ 5.231^{15} \\ 5.272^{13} \\ 4.918^{15} \end{array}$	4.20 ²⁴ 4.337 ²⁴ 4.568 ²⁴	$\begin{array}{c} & & & \\$	4.65 4.787 4.78	5.75^{21} 5.987^{23} 6.08^{23}	5.85 6.05 6.18
St. Paul St. Louis Memphis, Tenn. Birmingham New Orleans (city)	3.76^2 3.647^1 4.015^3 3.50^1 4.10^4	3.81^{2} 3.697^{1} 4.065^{3} 3.55^{1} 3.90^{1}	3.81^2 3.697^1 4.065^3 3.55^1 3.90^4	5.41^2 5.297^3 5.78^5 5.903^1 5.85^4	3.51^2 3.397^1 3.965^5 3.45^1 4.058^4	3.86^{2} 3.747^{1} 4.215^{5} 3.70^{1} 4.20^{4}	$\begin{array}{r} 3.86^2\\ 3.747^{11}\\ 4.215^5\\ 3.70^1\\ 4.20^4\end{array}$	$\begin{array}{r} 5.257^{16} \\ 5.172^{13} \\ 5.265^{15} \\ 4.75^{15} \\ 5.25^{26} \end{array}$	$\begin{array}{r} 4.46^{24} \\ 4.347^{24} \\ 4.78^{24} \\ 4.852^{24} \\ 5.079^{10} \end{array}$	$\begin{array}{r} 4.461^{21} \\ 4.131^{21} \\ 4.43^{21} \\ 4.64 \\ 4.70^{21} \end{array}$	5.102 4.931 5.215 5.429	6.09 ²³ 6.131 ²³	6.19 6.35
Houston, Tex. Los Angeles San Francisco Portland, Oreg. Tacoma Seattle	$\begin{array}{r} 3.75^{3} \\ 4.40^{1} \\ 4.15^{7} \\ 4.45^{27} \\ 4.35^{6} \\ 4.35^{6} \end{array}$	$\begin{array}{r} 4.25^{3} \\ 4.65^{4} \\ 4.35^{7} \\ 4.45^{27} \\ 4.45^{6} \\ 4.45^{0} \end{array}$	$\begin{array}{r} 4.25^{\circ}\\ 4.95^{\circ}\\ 4.65^{\circ}\\ 4.75^{\circ}\\ 4.75^{\circ}\\ 4.75^{\circ}\end{array}$	$\begin{array}{c} 5.50^3 \\ 7.20^4 \\ 6.35^7 \\ 6.50^{27} \\ 6.50^6 \\ 6.50^6 \end{array}$	$\begin{array}{r} 3.763^{3} \\ 5.00^{4} \\ 4.55^{7} \\ 4.65^{27} \\ 4.65^{6} \\ 4.65^{6} \end{array}$	$\begin{array}{r} 4.313^{\circ}\\ 4.95^{4}\\ 4.50^{7}\\ 4.75^{27}\\ 4.25^{\prime\prime}\\ 4.25^{\circ}\end{array}$	$\begin{array}{r} 4.313^{3}\\ 6.75^{4}\\ 5.75^{7}\\ 6.30^{27}\\ 5.45^{6}\\ 5.45^{6}\end{array}$	$\begin{array}{c} 5.313^{29} \\ 6.00^{12} \\ 6.35^{15} \\ 5.75^{15} \\ 5.95^{15} \\ 5.95^{15} \end{array}$	$\begin{array}{c} 4.10^{10} \\ 7.20^{0} \\ 7.30^{15} \\ 6.60^{15} \\ 7.60^{15} \\ 7.05^{15} \end{array}$	$\begin{array}{r} 3.75^{23} \\ 5.683^{22} \\ 5.433^{21} \\ 5.633^{15} \\ 5.883^{21} \\ 5.883^{21} \end{array}$	5.613 7.333	5.85 ²³ 8.304 ²³	5.97 8.45 8.07 8.07 8.07

*Basing point cities with quotations representing mill prices, plus warehouse spread. NOTE-All prices fixed by Office of Price Administration in Amendments Nos. 10 to 33 to Revised Price Schedule No. 49. Deliveries above cities computed in accordance with regulations.

BASE QUANTITIES

¹⁴⁰⁰ to 1999 pounds; ²-400 to 14,999 pounds; ³-any quantity; -300 to 1999 pounds; ⁴-400 to 8999 pounds; ⁶-300 to 9999 pounds; ¹-400 to 39,999 pounds; ⁴-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; ¹⁰—100 to 749 pounds; ²⁰—300 to 1999 pc ¹⁸—1500 to 39,999 pounds; ²²—1500 to 1999 pounds; ²³—1000 to 1999 pounds; ²⁴—400 to 1499 pounds; ²⁵—1000 to 1999 pounds; ²⁶—1000 to 1999 pounds; *- 300 to 4999 pounds.

Cres Lake Superior Iron Ore Gross ton, 51½% (Natural) Lower Lake Ports Old range hossemer \$4.75 Mesabi hossesemer \$4.55 Mesabi bessemer \$4.60 Old range nonbessemer \$4.60 Old range \$5.60 Old rang	Indian and African 48% 2.8:1 \$41.00 48% 3:1 43.50 48% no ratio \$1.00 South African (Transvaal) 44% no ratio 44% no ratio \$27.40 45% no ratio 28.30 48% no ratio 31.00 South African (Transvaal) 44% no ratio 45% no ratio 28.30 8% no ratio 31.00 50% no ratio 32.80 Brazilian—nominal 44% 2.5:1 lump 33.65 48% S:1 lump 43.50	Khodesian 45% no ratio 28.30 48% 3:1 lump 31.00 48% 3:1 lump 43.50 Domestic (sellar's nearest rail) 48% 3:1 48% 3:1 52.80 28% 8:1 52.80 Manganese Ore 52.81 Sales prices of Metals Reserve Co., cents per gross ton unit, dry, 48%, at New York, Philadelphia, Baltimore, Norfolk, Mobile and New Orleans, 85.0c; Fontana, Calif.,	Provo, Utah, and Pueble, 6 91.0c; prices include duty or ported ore and are subject lo miums, penalties and other sions of amended M.P.R. Na effective as of May 15. For basing points which are also of discharge of imported nese ore is f.o.b. cars, ships dock most favorable to the Molybdenum Sulphide conc., Ib., Mo. cont.
Cents per unit, c.i.f. Atlantic ports Manganiferous ore, 45-			Delle D
55% Fe., 6-10% Mang. Nom. N. African low phos. Nom.	NATION	IAL EMERGENCY STEELS (Hot	LE HOLDER AND THE REAL PROPERTY OF
Spanish, No. African bas- ic, 50 to 60% Nom.	(Extras for alloy content)		Basic open-hearth Electric
Brazil iron ore, 68-69% f.o.b. Rio de Janeiro 7.50-8.00	Desig-	al Composition Limits, Per Cent	per Billets per the

.28-.33

.18-.23

NATIONAL EMERGENCY STEELS (Hot Rolled)

Basic open-hearth Electric (Extras for alloy content) Nom. Bars ------ Chemical Composition Limits, Per Cent -7.50-8.00 Desigper 100 lb. Cr. Mo. Carbon Mn. Si. Ni. nation .15-.25 .20-.30 .08-.15 .08-.15 .08-.15 .15-.25 .20-.30 \$0.65 .10-.15 .70-.90 .40-.60 .40-.70 NE 8612 .20-.35 NE 8612 NE 8720. NE 9415. NE 9425. NE 9442. NE 9722. NE 9830. NE 9912. NE 9920. .70-.90.70-.90.80-1.10.80-1.201.00-1.30.50-.80.70-.90.50-.70.50-.70.70 .75 .75 .80 .40-.60.40-.60.30-.50.30-.50.30-.50.10-.25.70-.90.40-.60.20-.35 .20-.35 .20-.35 .20-.35 .20-.35 .20-.35 .18-.23 .13-.18 .23-.28 .40-.70 .30-.60 .30-.60 \$24.00 .30-.60 .30-.60 .40-.70 .85-1.15 1.00-1.30 1.00-1.30 .40-.45 .65 1.30 1.20

.20-.35

(Equivalent OPA schedules): Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charles-ton, S. C., Portland, Ore., or Ta-coma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Chrome Ore

Tungsten Ore Chinese Wolframite, per short ton unit, duty paid

Extras are in addition to a base price of 2.70c, per pound on finished products and \$54 per gross to semifinished steel major basing points and are in cents per pound and dollars per gross ton. No price co

.40-.60

\$1.15 \$

541 T 101 / N 1/2

C2 C2

1.201.251.251.25

 $\begin{array}{r}
 1.25 \\
 1.30 \\
 1.15 \\
 1.80 \\
 1.55 \\
 1.55 \\
 \end{array}$

Billets per a per de la per GT 100 lb. pe

\$13.00 14.00 15.00 15.00

 $\begin{array}{c} 15.00\\ 16.00\\ 13.00\\ 26.00\\ 24.00\\ 24.00\end{array}$

1.20

.20-.30

Prices (in gross tons) are maximums fixed by OPA Price Schedule No. 10 effective June 10, 1941, amended Feb. 14, 1945. Exceptions indicated in footnotes. Base prices bold face, delivered light face. Federal tax m freight charges, effective Dec. 1, 1942, not included in following prices.

	2	N. 22 P.O.		Mal-
	Foundry	Basic	Bessemer	leable
Bethlehem, Pa., base	\$26.00	\$25.50	\$27.00	\$26,50
Newark, N. J., del.	27.53	27.03	28.53	28.03
Brooklyn, N. Y., del.	28.50		and the second second second second	
Birdsboro, Pa., base	26.00	25.50	27.00	29.00
Birmingham, base	†21.38	120.00		26.50
Baltimore, del	26.61	and a second sec	26.00	
Boston, del.	26.12			
Chicago, del.				
Cincinnati, del.	25.22	12***		
Cleveland, del.	25.06	23.68		
Neverb NT T	25,12	24.24		
Newark, N. J.	27.15			
Philadelphia, del.	26.46	25.96		
St. Louis, del	25.12	24.24		
Buffalo, base	25.00	24.00	26.00	
Boston, del.	26.50	26,00	27.50	25.50
Rochester, del.	26.53		27.53	27.00
Syracuse, del.	27.08			27.03
Chicago, base	25.00	24,50	28.08	27.58
MIMankee, del.	26.10		25.50	25.00
Muskegon, Mich., del.	28.19	25.60	26.60	26.10
Cleveland, base	25.00			28.19
Akron, Canton, O., del.		24.50	25.50	25.00
Detroit, base	26.39	25.89	26.89	26.39
Saginam Mich dat	25.00	24.50	25,50	25.00
Saginaw, Mich., del	27.31	26.81	27.81	27,31
Duluth, base	25.50	25.00	26.00	25.50
St. Paul, del.	27.63	27.13	28.13	27.63
Erie, Pa., base	25.00	24.50	26.00	25,50
Everett, Mass., base	26.00	25,50	27.00	26.50
Doston, del.	26.50	26,00	27.50	20.00
thamte City, Ill., hase	25,00	24.50	25.50	27.00
al LOUIS. DEL	25.50	25.00		25.00
paminton, U., base	25.00	24.50	1	25.50
cucumati, del.	25.44	25.61		25.00
Acrille Island, Pa., hase	25.00			26.11
Pittsburgh, del.	20.00	24.50	25.50	25.00
No. & So. sides	25.69	07 10		
Provo, Utab, base		25.19	26.19	25.69
Statuardile Pa base	23.00	22.50		
Sparpsville, Pa., base	25.00	24.50	25.50	25.00
Sparrows Point, base	26.00	25.50		
Baltimore, del.	26.99			
Laceton, 14., Dasp		25.50		26.50
Dhiladalatian Dase	26.00	25.50	27.00	26,50
* madelpilla. opi	26.84	26.34		
Adiego, U., base	25.00	24.50	25.50	27.34
The stown, U., hase	25,00	24.50	25.50	25.00
Mansfield, O., del	26.94	26.44		25.00
	-0.01	20.11	27.44	26.94

Rase grade, silicon 1.75-2.25%; add 50 cents for each additional 0.25% silicon, or portion thereof; deduct 50 cents for silicon below 1.75% on fundry iron. †For phosphorus 0.70% or over deduct 38 cents. §For Kekes Rocks, Pa., add .55 to Neville Island base; Lawrenceville, Home-stead, McKeesport, Ambridge, Monaco, Allquippa, .84; Monessen, Monon-zahela City .97 (water); Oakmont, Verona 1.11; Brackenbridge 1.24. Note: Add 50 cents per ton for each 0.50% manganese or portion thereof over 1.00%. Nicked differentials: Under 0.50%, no extra; 0.50% to 0.74% incl., \$2 per ten; for each additional 0.25% nickel, \$1 per ton.

Feromanganese (standard) 78-82% cl. goss ton, duty paid, \$135 f.o.b. ars, Baillunce, Philadelphia or New York, Wichever is most favorable to buyer; Rockdale or Rockwood, Ten, where Tennessee Products Co is producer; Birmingham, Ala.; where Sloss-Sheffield Steel & Iron Co is producer; SiJo f.o.b. cars, Pitaburah, where Carnegie-Illinois Steel Corp, is producer; add S6 for packed c.l., SM0 for ton, \$31.350 for packed c.l., SM0 for ton, \$31.350 for isst on; S1.70 for each 1%, or frac-tion contained manganese over 82% of under 78%; delivered Pittsburgh, \$140.33

Si4.33
Fernmanganese (Low and Medium Carbon); per ib. contained man-carbon); per ib. contained man-carbon); per ib. contained man-anese; eastern zone, low carbon, buk, cl., 23c: 2000 lb. to c.l., 24.40c; eastern dum, 14.50c and 15.20c; central, low carbon, bulk, c.l., 24.40c; medium 14.90c and 16.20c; westi-medium 14.90c and 16.20c; westi-tim, low carbon, bulk, c.l., 24.40c; molium 14.90c and 16.20c; westi-medium 14.90c and 16.20c; westi-medium 14.90c and 16.20c; westi-medium 14.90c and 16.20c; westi-medium 14.90c and 16.20c; setting point, freight allowed.
Spizelesen: 19-21% carlots per stast ton, Palmetton, Pa., S36; Futsburgh S40.50; Chicago, S40.60, Electrolytic Manganese; 29.9% plus, tast ton lots, per ib. 37.6 cents.

les ton lots, per ib. 37.6 cents. Consum Metal: 97% min. chromi-um max. 50% carbon, eastern 25. per h. contained chromium ba cr. 49.50c, 2000 lb. to cl. Sci miral Sic and 82.50c; west-ern Sick and 84.75c; 1.0.b. ship-phe point, freight allowed. Friedminhum: 50-60%, per lb. contained columbium in gross ton bits contract basis, R. R. freight allowed astern zone, \$2.25; less-ton lots \$2.30 Spot prices 10 cents per lb. her. Ferrochrome: High carbon, eastern

Zone, bulk, c.l., 13c, 2000 lb, to c.l. 13.90c; central, add .40c and .65c; western, add lc and 1.85c--high nitrogen, high carbon ferro-chrome; Add 5c to all high carbon ferrochrome prices; all zones; low carbon eastern, bulk, c.l. max. 0.06% carbon, 25c, 0.10% 22.50c, 0.15% 22c, 0.20% 21.50c, 0.50% 21c, 1.00% 20.50c, 2.00% 19.50c; 2000 lb. to c.l., 0.06% 24c, 0.10% 23.50c, 0.15% 23c, 0.20% 22.50c, 0.50% 22c, 1.00% 24c, 0.10% 23.50c, 0.15% 23c, 0.20% 22.50c, 0.50% 22c, 1.00% 24c, 0.10% 23.50c, central, add .4c for bulk, c.l. and .65 for 2000 lb. to c.l.; western, add 1c for bulk, c.l. and 1.85c for 2000 lb. c.l.; carload packed differential. 45c; f.o.b. ship-ping point, freight allowed. Prices per lb. contained Cr high nitrogen, low carbon ferrochrome rAdd 2c to low carbon ferrochrome prices; all zones. For higher nitrogen carbon add 2c for each .25% of nitrogen over 0.75%. over 0.75%.

Special Foundry ferrochrome: (Chrom. 62-66%, car. approx. 5-7%) Contract, carload, bulk 13.50c, packed 13.95c, ton lots 14.40c, less, 14.90c, eastern, freight allowed, per pound contained chromium; 13.90c, 14.35c, 15.05c and 15.55c central; 14.50c, 14.95c, 16.25c and 16.75c, western; spot up .25c.

S.M. Ferrochrome, high carbon: (Chrom: 60-65%, sil. 4-6%, mang. 4-6% and carbon 4-6%.) Contract, carlot, bulk, 14.00c, packed 14.45c, ton lots 14.90c, less 15.40c, eastern, freight allowed; 14.40c, 14.85c, 15.55c and 16.05c, central; 15.00c, 15.45c, 16.75c and 17.25c, western; spot up .25c; per pound contained chromium.

S.M. Ferrochrome, low carbon: (Chrom. 62-66%, sll. 4-6%, mang.

High Sillcon, Slivery

6

6.00-6.50 per cent	(base) \$30.50
6.51-7.00. \$31.50	9.01- 9.50. 36.50
7.01-7.50 32.50	9,51-10.00, 37.50
7.51-8.00 33.50	10.01-10.50, 38.50
8.01-8.50 34.50	10.51-11.00, 39.50
8.51-9.00 35.50	11.01-11.50. 40.50
	and a second second second second

F.o.b. Jackson county, O., per gross ton, Buffalo base \$1.25 higher, whichever is most favorable to buyer. Prices subject to additional charge of 50 cents a ton for each 0.50% manganese in excess of 1.00%. Electric Furnace Fernosilcon: Sil. 14.01 to 14.50%, \$45.50; each addi-tional.50% silicon up to and includ-ing 18% add \$1; low impurities not exceeding 0.05 Phos., 0.40 Sulphur, 1.0% Carbon, add \$1.

Bessemer Ferrosilicon Prices same as for high silicon sil-very iron, plus \$1 per gross ton.

Charcoal Pig Iron Northern

Lake Su		F	ľ	1	n	1,	,					•	.\$34,00
Chicago,	del.							•		•	•		. 37.34

Southern Southern Semi-cold blast, high phos. f.o.b. furnace, Lyles, Tenn., \$28.50 Semi-cold blast, low phos., f.o.b. furnace, Lyles, Tenn. 33.00 (For higher silicon irons a differ-ential over and above the price of base grades is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge Neville Island, Pa

Valley	base .	·	•	•	•	•	•	•	•	•	•	•	•	•	•	•	24.50
	Low	1	D	2.	~	-	-	3.		-		-					

Low Phosphorus Low Phosphorus Basing points: Birdsboro, Pa., \$30.50; Steelton, Pa., and Buffalo, N. Y., 30.50 base; 31.74, del. Philadelphia. Intermediate phos., Central Furnace, Cleveland, \$27.50 Switching Charges: Basing point prices are subject to an additional charge for delivery within the switching limits of the respective districts. districts.

districts. Silicon Differential: Basing point prices are subject to an additional charge not to exceed 50 cents a ton for each 0.25 silicon in excess of base grade (1.75 to 2.25%). Phosphorus Differential: Basing point prices are subject to a reduc-tion of 38 cents a ton for phos-phorus content of 0.70% and over. Colling Prices are the avergragate of

Ceiling Prices are the aggregate of (1) governing basing point (2) dif-ferentials (3) transportation charges

Ferroalloy Prices

4-6% and carbon 1.25% max.) Con-tract, carlot, bulk, 20.00c, packed 20.45c, ton lots 21.00c, less ton lots 22.00c, eastern, freight allowed, per pound contained chromium, 20.40c, 20.85c, 21.65c and 22.65c, central; 21.00c, 21.45c, 22.85c and 23.85c, western; spot up .25c.

Western; spot up .25c. SMZ Alloy: (Silicon 60-65%, Mang. 5-7%, zlr. 5-7% and iron approx. 20%) per lb. of alloy contract car-lots_11.50c, ton lots 12.00c, less 12.50c, eastern zone, freight al-lowed; 12.00c, 12.85c and 13.35c central zone; 14.05c, 14.60c and 15.10c, western; spot up .25c.

Silcaz Alloy: (Sil. 35-40%, cal. 9-11%, alum. 6-8%, zir. 3-5%, tit. 9-11% and boron 0.55-0.75%), per b. 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 25c 25c.

Silvaz Alloy: (Sil. 35-40%, van. 9-11%, alum. 5-7%, zir. 5-7%, tit. 9-11% and boron 0.55-0.75%), per 1b. 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 $\frac{1}{3}c$.

62.30C, Western; spot up 14c. CMSZ Alloy 4: (Chr. 45-49%, mang. 4-6%, sll. 18-21%, zlr. 1.25-1.75%, and car. 3.00-4.50%). Contract, car-lots, 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 un 25c up .25c.

CMSZ Alloy 5: (Chr. 50-56%, mang. 4-6%, sil. 13.50-16.00%, zir. .75-1.25%, car. 3.50-5.00%) per lb. of alloy. Contract, carlots, bulk, 10.75c,

from governing basing point to point of delivery as customarily computed. Governing basing point is the one resulting in the lowest delivered price for the consumer. Exceptions to Celling Prices: Struthers Iron & Steel Co. may charge 50 cents a ton in excess of basing point prices for No. 2 Found-ry. Basic Bessemer and Malleable. Mystic Iron Works, Everett, Mass., may exceed basing point prices by \$1 per ton.

Refractories

Per 1000 f.o.b. Works, Net 1	Prices
Fire Clay Brick	
Super Duty	
Pa., Mo., Ky	68.50
First Quality	
Pa., Ill., Md., Mo., Ky.	54.40
Alabama, Georgia	54 40
New Jersey	59.35
Onio	47.70
Second Quality	
Pa., Ill., Md., Mo., Ky.	49.35
Alabama, Georgia	40.30 52.00
Ohio	38.15
Malleable Bung Brick	
All bases	63.45
Silica Brick	
Pennsylvania	54.40
Jonet, E. Chicago	62.45
Birmingham, Ala	54.40
Ladie Brick (Pa., O., W. Va., Mo.)	
Dry Press	32 00
Dry Press Wire Cut	30.80
Magnoelto	
Domestic dead-burned grains,	
net ton f.o.b. Chewelah.	1.000
Wash., net ton, bulk	22.00
Basic Brick	26.00
net ton, fob Baltimore Plum	outh
net ton, f.o.b. Baltimore, Plym Meeting, Chester, Pa.	iouui
Chrome brick	54.00
Chem. bonded chrome	54.00
	76.00
Chem. Donueu Magnesite	65.00

Fluorspar

Metallurgical grade, f.o.b. Ill., Ky., net tons, carloads, CaF² content, 70% or more, \$33; 65 but less than 70%, \$32; 60 but less than 65% \$31; less than 60%, \$30. After Aug. 29 base price any grade \$30.00 war chemicals.

packed 11.25c, ton lots 11.75c, less 12.25c, eastern, freight allowed; 11.25c, 11.75c and 12.50c, central; 13.25c and 13.75c, 14.50c and 15.00c, western; spot up .25c. Ferro-Boron: (Bor. 17.50% min., sll. 1.50% max., alum. 0.50% max. and car. 0.50% max.) per lb. of alloy contract ton lots, \$1.20, less ton lots \$1.30, eastern, freight al-lowed; \$1.2075 and \$1.3075 central; \$1.229 and \$1.329, western; spot add 5c.

Manganese-Boron: (Mang. 75% ap-prox., boron 15-20%, iron 5% max. sli. 1.50% max. and carbon 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: (Bor. 15-18%, alum. 1% max., sil. 1.50% max., car. 0.50% max., iron 3% max., nickel, balance), per ib. of alloy. Contract, 5 tons or more, \$1.90, 1 ton to 8 tons, \$2.00, less than ton \$2.10, eastern, freight allowed; \$1.9125 \$2.0125 and \$2.1125, central; \$1.9445, \$2.0445 and \$2.1145, west-ern; spot same as contract.

ern; spot same as contract. Chromium-Copper; (Chrom, 8-11%, cu. 88-90%, iron 1% max. sll. 0.50% max.) contract, any quan-uty, 45c, eastern, Niagara Falls, N. Y., basis, freight allowed to des-tination, except to points taking rate in excess of St. Louis rate to which equivalent of St. Louis rate will be allowed; spot up 2c. Vanadium Oxide: (Fused: Vana-dium oxide 85-88%, sodium oxide approx. 10% and calcium oxide; approx. 2%, or Red Cake; Vana-dium oxide 85% approx, sodium ox-ide, approx. 9% and water approx.

2.5%) Contract, any quantity, \$1.10 eastern, freight allowed per pound vanadium oxide contained; contract carlots, \$1.105, less carlots, \$1.108, central; \$1.118 and \$1.133, western; spot add 5c to contracts in all cases. Caiclum metal; cast: Contract ton lots or more \$1.80, less, \$2.30, eastern zone, freight allowed, per pound of metal; \$1.809 and \$2.309 central, \$1.849 and \$2.349, west-ern; spot up 5c. Catchura-Manganese-Silicon: (Cal. 16-20% mang, 14-18% and sil. 33-59%), 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 25c. Calchum-Silicon: (Cal. 30-35%, sil. 60.65c, and 20.05%

spot up .25c. Calclum-Sillcon: (Cal. 30-35%, sil. 60-65% and iron 3.00% max.), per lb. of alloy. Contract, carlot, lump 18.00c, ton lots 14.50c, less 15.50c, castern, freight allowed; 13.50c, 15.25c and 16.25c central; 15.55c. 17.40c and 18.40c, western; spot up .25c.

up .25c. Briauets, Ferromanganese: (Weight approx. 3 lbs. and containing ex-actly 2 lbs. mang.) per lb. of bri-quets. Contract, carlots, bulk .0605c, packed .063c, tons .0655c, less .0685c eastern freight allowed; .063c, .0635c, .0755c and .078c, central; .065c, .0685c, .0835c, and .088c, western; spot up .25c. Briquets: Ferrochrome, containing evacity 2 lb. cr. .eastern zone, bulk

western; spot up .25c. Briquets: Ferrochrome, containing exactly 2 lb. cr., eastern zone, bulk, c.l., 8.25c per lb. of briquets, 2000 lb. to c.l., 8.75c; central, add .3c for c.l. and .5c for 2000 lb. to c.l.; western, add .70c for c.l., and .2c for 2000 lb. to c.l.; silicomanganese,

10 c.l., 13.10c; 50%, bulk, c.l., 7.25c, 2000 to c.l., 8.75c; f.o.b. ship-ping point, freight allowed. Prices per lb. contained silicon.
Silicon Metal: Min. 97% silicon and max. 1% iron, eastern zone, bulk, c.l., 12.90c; 2000 lb. to c.l., 13.45c; central, 13.20c and 13.90c; western, 10.85c and 16.80c; min. 96% silicon and max. 2% iron, eastern, bulk, c.l., 12.50c, 2000 lb. to c.l., 13.10c; central, 12.80e and 13.55c; western, 13.45c and 16.50c i.o.b. shipping point, freight allowed. Price per lb. contained silicon.
Manganese Metal! (96 to 98% man-ganese, max. 2% iron), per lb. of metal, eastern zone, bulk, c.l., 36c 2000 lb. to c.l., 38c, central, 36.25c, and 39c; western 36.55c and 41.05c; p5 to 97% manganese, max. 2.50% iron, eastern, bulk, c.l., 34c; 2000 to c.l., 35c; central 34.25c and 36c; western, 34.55c and 36.65c; f.o.b. shipping point, freight allowed.
Ferrotunesten: Spot, carlots, per lb. cutaned tungsten, 51.90; freight allowed as far west as St. Louis.
Ferrotitanium: 40-45%, R.R. freight allowed, per ub. contained titanium;

Ferrotitanium: 40-45%, R.R. freight Ferrotitanium: 40-45%, R.R. freight allowed, per lb. contained titanium; ton lots \$1.23; less-ton lots \$1.25; eastern. Spot up 5 cents per lb. Ferrotitanium: 20-25%, 0.10 maxi-mum carbon; per lb. contained ti-tanium; ton lots \$1.35; less-ton lots \$1.40 eastern. Spot 5 cents per lb. bigher higher

High-Carbon Ferrotitanium: 15-20% contract basis, per gross ton, f.o.b. Niagara Falls, N. Y., freight al-

lowed to destination east of Mer-sippi River and North of Bahar and St. Louis, 6.8% carbon ster-o-5% carbon S157.50. Carbortann: Boron 0.90 to 11 net ton to carload, 8c h. 10 Suspension Bridge, N. Y., fr. lowed same as high-carbon fa-titanium. Locanat: Boron 1.5-1.9% ton h 45c lb., less ton lots 50c h. Ferrovanatium: 35-555, cour-basis, per lb. contained vande f.o.b. producers plant with as 1 r e i g n t allowances; open-grade \$2.70; special grade 52.90. Zitconium Alloys: 12-15% per of alloy, eastern contract, cm 480c, less tons 5c, carloads, he per gross ton \$102.50; he spit alloy, carloads in but per gross ton \$102.50; he \$107.50; ton lots \$108; less-te \$112.50. Spot 4c per ton highe Zirconium Alloys; 35-4076, Ezz contract basis, carloads in but package, per lb. od alloy 14 gross ton lots 15.00c; less-ton 16.00c. Spot 14 cent higher.

Abifer: (Approx. 20% alumin 40% silicon, 40% iron) contrat is f.o.b. Niagara Falls, N. T., 1b. 5.75c; ton lots 6.50c. Spa cent higher.

Siminat: (Approx. 20% each 3 Mn., Al.) Contract, frt. all. not o St. Louis rate, per lb. alloy; o lots 8c; ton lots 8.75c; less ton 1 9.25c 9.25c.

Borosil: 3 to 4% boron, 40 to 5 Sl., \$6.25 lb. cont. Bo., f.ob. Ph U., freight not exceeding Sl. Lo rate allowed.

TEE

OPEN MARKET PRICES, IRON AND STEEL SCRA

Following prices are quotations developed by editors of STEEL in the various centers. For complete OPA ceiling price schedule refer to page of Sept. 4, 1944, issue of STEEL. Quotations are on gross tons.

INNIN

PHILADELPHIA:	BOSTON:	Solid Steel Axles 24.00	Machine Turnings
(Delivered consumer's plant)	(F.o.b. shipping points) No. 1 Heavy Melt. Steel \$14.06	Cupola Cast 20.00 Stove Plate 19.00	Shoveling Turnings Rerolling Rails
No. 1 Heavy Melt. Steel \$18.75	No. 2 Heavy Melt. Steel 14.06	Long Turnings 8.50- 9.00	Steel Car Axles 21.50-1
No. 2 Heavy Melt. Steel 18.75	No. 1 Dundles 14.06	Cast Iron Borings 8.50- 9.00	Steel Rails, 3 ft.
No. 2 Bundles 18.75	No. 2 Bundles 14.06	Iron Car Wheels 16.50-17.00	Steel Angle Bars
No. 3 Bundles 16.75	No. 1 Busheling 14.06	CHICAGO:	Cast Iron Wheels
Mixed Borings, Turnings 13.75	Machine Shop Turnings 9.06	(Delivered consumer's plant)	No. 1 Machinery Cast
Machine Shop Turnings 13.75	Mixed Borings, Turnings 9.06	No. 1 R.R. Hvy Melt. \$19.75	Railroad Malleable
Billet, Forge Crops 23.75	Short Shovel Turnings 11.06	No. 1 Heavy Melt. Steel 18.75	Breakable Cast
Bar Crops, Plate Scrap 21.25	Chemical Borings 13.81	No. 2 Heavy Melt. Steel 18.75	Stove Plate
Cast Steel 21.25	Low Phos. Clippings 16.56	No. 1 Ind. Bundles 18.75	Grate Bars
Punchings 21.25	No. 1 Cast	No. 2 Dir. Bundles 18.75	Brake Shoes shinning
Elec. Furnace Bundles 19.75	Clean Auto Cast 20.00	Baled Mach. Shop Turn 18.75	(Cast grades f.o.b. shipping "
Heavy Turnings 18.25	Stove Plate	No. 3 Galv. Bundles 16.75	Stove Plate
	Heavy Breakable Cast . 16.50	Machine Turnings 13.75	and a margin that is interfactorial the
Cast Grades	Boston Differential 99 cents high-	Mix. Borings, Sht. Turn 13.75	CINCINNATI:
(Tal State Dist	er, steel-making grades; Providence	Short Shovel Turnings 15.75	(Delivered consumer's plant
(F.o.b. Shipping Point)	\$1.09 higher.	Cast Iron Borings 14.75	No. 1 Heavy Melt. Steel
Heavy Breakable Cast. 16.50	THE OWNER AND AND AND	Scrap Rails 20.25	No. 2 Heavy Melt. Steel
Charging Box Cast 19.00	PITTSBURGH:	Cut Rails, 3 feet 22.25	No. 1 Comp. Bundles
Cupola Cast 20.00	(Delivered consumer's plant)	Cut Rails, 18-inch 23.50	No. 2 Comp. Bundles 9.50-5
Unstripped Motor Blocks 17.50	Railroad Heavy Melting \$21.00 No. 1 Heavy Melt. Steel 20.00	Angles, Splice Bars 22.25	
Malleable 22.00	No. 2 Heavy Melt. Steel 20.00	Plate Scrap, Punchings . 21.25	Shoveling Turnings 11.50-1
Chemical Borings 16.51	No. 1 Comp. Bundles 20.00	Railroad Specialties 22.75 No. 1 Cast 20.00	Cast Iron Borings 11.00-D Mixed Borings, Turnings 10.53-D
	No. 2 Comp. Bundles 20.00		Mixed Borings, Turnings see
VEW YORK.	Short Shovel Turnings. 17.00	R.R. Malleable 22.00 (Cast grades f.o.b. shipping point,	No. 1 Cupola Cast
NEW YORK:	Mach Shop Turnings 15.00	railroad grades 1.0.b. tracks)	Breakable Cast 21.00-2 Low Phosphorus 20.50-3
(Dealers' buying prices.)	Mixed Borings, Turnings 15.00	Tumbad Arades 1.0.0. (Tacha)	
No 1 Hopping Malt Charl mar on	No. 1 Cupola Cast 20.00	BUFFALO:	Stove Plate 16.00-18
No. 1 Heavy Melt. Steel \$15.33 No. 2 Heavy Melt. Steel 15.33	Heavy Breakable Cast. 16.50	(Delivered consumer's plant)	Diove I have the
	Cast Iron Borings 16.00	No. 1 Heavy Melt. Steel \$19.25	LOS ANGELES:
No. 2 Hyd. Bundles 15.33 No. 3 Hyd. Bundles 13.33	Billet, Bloom Crops 25.00	No. 2 Heavy Melt, Steel 19.25	(Delivered consumer's plant
Chemical Borings 14,33	Sheet Bar Crops 22.50 Plate Scrap, Punchings 22.50	No. 1 Bundles 19.25	No 1 Heavy Melt. Steel
Machine Turnings	Plate Scrap, Punchings 22.50 Railroad Specialties 24,50	No. 2 Bundles 19.25 No. 1 Busheling 19.25	No 2 Heavy Melt. Steel
Mixed Borings, Turnings 10.33	Scrap Rail 21.50	Machine Turnings 14.25	No. 1. 2. Deal. Bundles
No. 1 Cupola	Axles	Short Shovel Turnings. 16.25	Machine Turnings
Charging Box 19.00	Rail 3 ft. and under 23,50	Mixed Borings, Turn 14.25	Mixed Borings, Turnings
Heavy Breakable 16.50	Railroad Malleable 22.00	Cast Iron Borings 15.25	No. 1 Cast
Unstrip Motor Blocks 17.50	CARD AND SERVICE AND A CARD AND A	Low Phos 21.75	
Stove Plate 19.00	VALLEY:	DETROIT:	SAN FRANCISCO:
	(Delivered consumer's plant)	(Dealers' buying prices.)	(Delivered consumer's plant
CLEVELAND:	No. 1 R.R. Hvy Melt \$21.00	Heavy Melting Steel \$17.32	No 1 Heavy Mell, Steel
	No. 1 Heavy Melt. Steel 20.00	No. 1 Busheling 17.32	No. 2 Heavy Melt. Sieer
(Delivered consumer's plant)	No. 1 Comp. Bundles. 20.00	Hydraulic Bundles 17.32	No. 1 Busheling
No. 1 Heavy Melt. Steel \$19.50	Short Shovel Turnings. 17.00 Cast Iron Borings 16.00	Flashings 17.32	No. 1, No. 2 Bundles No. 3 Bundles
No. 2 Heavy Melt. Steel 19.50		Machine Turnings 12.32	Machine Turnings
No. 1 Comp. Bundles 19.50	Machine Shop Turnings 15.00 Low Phos. Plate 22.50	Short Shovel, Turnings 14.32	Billot Forge Crops
No. 2 Comp. Bundles 19.50	20% Thos. Thate 22.00	Cast Iron Borings 13.32	Bar Crops, Plate
No. 1 Busheling 19.50	MANSFIELD, 0.:	Low Phos. Plate 19.82	Cast Steel
Mach. Shop Turnings 14.50	(Delivered consumer's plant)	No. 1 Cast 20.00	Cut. Structural, Plate,
Short Shovel Turnings 16.50	Machine Shop Turnings 15.00	Heavy Breakable Cast 16.50	1" under
Mixed Borings, Turnings 14.50	The state of the second state of the	ST. LOUIS	Alloy-free Turnings 1
No. 1 Cupola Cast 20.00	BIRMINGHAM:	(Delivered consumer's plant)	Tin Can Bundles 1
Heavy Breakable Cast. 16.50	(Delivered consumer's plant)	Heavy Melting 17.50	No 9 Stool Wheels
Cast Iron Borings 13.50-14,00 Billet, Bloom Crops 24,50	Billet Forge Crops \$22.00	No. 1 Locomotive Tires 20.00	Iron, Steel Axles
Billet, Bloom Crops 24,50 Sheet Bar Crops 22,00	Structural, Plate Scrap. 19.00 Scrap Rails Random . 18.50	Misc. Rails 19.00	No. 2 Cast Steel 16
Plate Scrap, Punchings. 22.00	Scrap Rails Random	Railroad Springs 22.00	Uncut Frogs, Switches.
Elec Furnace Bundles. 20.50	Angle Splice Bars 20.50	Bundled Sheets	Locomotive Tires
	20.00	Axle Turnings 17.00	Locomotive mass

Copper: Electrolytic or Lake from producers in carlots 12.00c, Del. Conn., less carlots 12.1214c, refnery; dealers may add % c for 5000 lbs. to carload; 1000-4999 lbs. 1c; 500-999 146; 0-499 2c. Cashing, 11.75c, refinery for 20,000 lbs., or more, 12.00e less than 20,000 lbs.

Brass Ingot: Carlot prices, including 25 cents per hundred freight allowance; add 34c for less than 20 tons; 85-5-55 (No. 115) 13.00e; 83-10-2 (No. 215) 16.50c; 80-10-10 (No. 305) 15.75c; Navy G (No. 225) 16.75c; Navy M (No. 245) 14.75c; No. 1 yellow (No. 405) 10.00c; manganese brenze (No. 420) 12.75c.

Zho: Prime western 8.25c, select 8.35c, brass speala 8.50c, intermediate 8.75c, E. St. Louis for carlots. For 20,000 lbs. to carlots add 0.55; 10,000-20,000 0.25c; 2000-10,000 0.40c; under 2000 0.50c.

Lad: Common 6.35c, chemical, 6.40c, corroding, 6.45c, E. St. Louis for carloads; add 5 points for Chicago, Minneapolis-St. Paul, Milwaukes-Kenosha districts; add 15 points for Cleveland-Akron-Detroit area, New Jersey New York state, Texas, Pacific Coast, Richmod, Indinapolis-Kokomo; add 20 points for Birmingham, Connecticut, Boston-Wercester, Springfield, New Hampshire, Rhode Island.

Primary Aluminum: 99% plus, ingots 15.00c del, pigs 14.00c del.; metallurgical 94% min. 13.50 del. Bass 10,000 lbs. and over; add ½c 2000-9999 lbs.; 1c less through 2000 lbs.

Secondary Aluminum: All grades 12.50c per lh. except as follows: Low grade piston alloy (No. 122 type) 10.50c; No. 12 foundry alloy (No. 2 stade) 10.50c; chemical warfare services ingot (921/5 plua) 10.00c; steel deoxidizers in notch bara, granulated or shot, Grade 1 (95.971/4) 11.00c, Grade 2 (92-95%) 9.50c to 9.75c, Grade 3 (90-92%) 8.50c to 8.75c, Grade 4 (85-90%) 7.50c to 8.00c; any other ingot containing over 1% iron, except PM 754 and hardness, 12.00c. Above prices for 30,000 lb. 0¢ more; add ½c 10,000-30,000 lb.; ½c 1000-10,000 lbs.; 1c less than 1000 lbs. Prices incide freight at carload rate up to 75 cents per hundred.

Mamedum: Commercially pure (99.8%) standard inputs (4-notch, 17 lbs.) 20.50e lb., add ic for special shapes and sizes. Alloy ingots, incendary bomb alloy, 23,40e; 50-50 magneturn-aluminum, 23,75c; ASTM B93-41T, No. 2, 3, 4, 12, 13, 14, 17, 23.00c; Nos. 4X, 11, 13X, 17X, 25.00c; ASTM B-107-41T, or B30-41T, No. 8X, 23.00c; No. 18, 23.50c; No. 15X, 25.00e, Selected magnesium crystals, crwsna, and muffs, including all packing streening, barreling, handling, and other preparation charges, 23.50c. Prices for 100 its or more; for 25.100 lbs, add 10c; for ien than 25 lbs., 20c. Incendiary bomb alloy, lob plant, any quantity; carload freight allowed all other alloys for 500 lbs, or more.

The Prices ex-dock, New York in 5-ton lots, Add 1 cent for 2240-11,199 lbs., 14c 1000-2239, 74c 500-999, 3c under 500. Grade A. 90.8% or higher (includes Strails), 52.00c; Grade B. 998% or higher, net meeting specifications for Grade A. with 0.05 per cent maximum arene, 5.1874c; Grade C. 99.65-99.79% incl. 51.874c; Grade D. 99.50-99.64% incl. 51.50c; Grade E. 99-99.49% incl. 51.1244c; Grade F, below 99% (for the content), 51.00c.

Animony: American bulk carlots f.o.b. Laredo, Tex. 99.0% to 99.8% and 99.8% and over but not meeting specifications below. 1450c: 99.8% and over (arsenic, 0.05%, max.) and other impurities, 0.1%, max.) 15.00c. On producers, sules add %c for less than carload to 18,000 lb.; ½c for 9999-224 lb; and 2c for 23 lb and less; on sales by dealers, distributors and loss; on sales by dealers, distributors and lobers add ½c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.5%, f.o.b. remery 35.00e lb.; pig and shet produced from descriptic cathodes 36.00c; "F" mixel shot input for additions to cast iron, 34.00c; Mand shot 28.00e.

Mercury: Open market, spot, New York, \$93-38 per 76-lb. flask.

Arsenic: Prime, white, 99%, carlets, 4.00c lb.

Benjilium-Copper: 3.75-4.25% Be., \$17 lb. contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, slicks, and all other "regular"

NONFERROUS METAL PRICES

straight or flat forms 90.00c lb., del.; anodes, balls, discs and all other special or patented shapes 95.00e lb. del.

Cobalt: 97-99%, \$1.50 lb. for 550 lb. (bbl.); \$1.52 lb. for 100 lb. (case); \$1.57 lb. under 100 lb.

Indlum: 99.9%, \$7.50 per troy ounce.

Gold: U. S. Treasury, \$35 per ounce.

Silver: Open market, N. Y. 70.625c per ounce. Platinum: \$35 per ounce

Iridium: \$165 per troy ounce.

Palladium: \$24 per troy ounce.

Rolled, Drawn, Extruded Products

(Copper and brass product prices based on 12.00c, Conn., for copper. Freight prepaid on 100 lbs. or more.)

Sheet: Copper 20.87c; yellow brass 19.48c; commercial bronze, 90% 21.07c, 95% 21.28c; red brass, 80% 20.15c, 85% 20.36c; phosphor bronze, Grades A and B 5% 36.25c; Everdur, Herculoy, Duronze or equiv. 26.00c; naval brass 24.50c; manganese bronze 28.00c; Muntz metal 22.75c; nickel silver 5% 26.50c.

Rods: Copper, hot-rolled 17.37c, cold-rolled 18.37c; yellow brass 15.01c; commercial bronze 90% 21.32c, 95% 21.53c; red brass 80% 20.48c, 85% 20.61c; phosphor bronze Grade A, B 5% 36.50c; Everdur, Herculoy, Duronze or equiv. 25.50c; Naval brass 19.12c; manganese bronze 22.50c; Muntz metal 18.87c; nickel silver 5% 26.50c.

Sramless Tubing: Copper 21.37c; yellow brass 22.23c; commercial bronze 90% 23.47c; red brass 80% 22.80c, 85% 23.01c.

Extruded Shapes: Copper 20.87c; architectural bronze 19.12c; manganese bronze 24.00c; Muntz metal 20.12c; Naval brass 20.37c.

Angles and Channels: Yellow brass 27.98c; commercial bronze 90% 29.57c, 95% 29.78c; red brass 80% 28.65c, 85% 28.86c.

Copper Wire: Soft, f.o.b. Eastern mills, carlots 15.374/c, less-carlots 15.874/c; weatherproof, f.o.b. Eastern mills, carlot 17.00c, less-carlots 17.50c; magnet, dellvered, carlots 17.50c, 15,000 lbs. or more 17.75c, less carlots 18.25c.

Aluminum Sheets and Circles: 2s and 3s, flat mill finish, base 30,000 lbs or more; del; sheet widths as indicated; circle diameter 9" and larger:

Gage	Width	Sheets	Circles
.249"-7	12"-48"	22.70c	25.20c
8-10	12"-48"	23.20c	25.70c
11-12	26"-48"	24.20c	27.00c
13-14	26"-48"	25.20c	28.50c
15-16	26"-48"	26.40c	30.40c
17-18	26"-48"	27.90c	32.90c
19-20	24"-42"	29.80c	35.30c
21-22	24"-42"	~d1.70c	37.20c
23-24	3"-24"	25.60c	29.20c

Lead Products: Prices to jobbers; full sheets 9.50c; cut shoets 9.75c; pipe 8.15c, New York; 8.25c, Philadelphia, Baltimore, Rochester and Buffalo; 8.75c, Chicago, Cleveland, Worcester, Boston.

Zinc Products: Sheet f.e.b. mill, 13.15c; 36,000 lbs. and over deduct 7%; Ribben and strip 12.25c. 3000-lb. lots deduct 1%, 6000 lbs. 2%, 9000 lbs. 3%, 13,000 lbs. 4%, carleads and over 7%. Boiler plate (not over 12") 3 tons and over 11.00c; 1-3 tons 12.00c; 500-2009 lbs. 12.50c; 100-500 lbs. 13.00c; under 100 lbs. 14.00c. Hull plate (over 12") add lc to boller plate prices.

Plating Materials

Chronalc Acid: 99.75%, flake, del., carloads 16.25c; 5 tons and ever 16.75c; 1-5 tons 17.25c; 400 lbs. to 1 ton 17.73c; under 400 lbs. 18.25c.

Copper Anodes: Base 2000-5000 lbs., del.; oval 17.62e; untrimmed 18.12c; electro-deposited 17.37c.

Copper Carbonate: 52-54% metallic cu, 250 lb. barrels 28,50c.

Copper Cyanide: 70-71% cu, 109-lb. kegs or bbis. 34.00c f.o.b. Niagara Falls. Sodium Cyanido: 96%, 200-lb. drunss 15.00c; 10,000-lb. lots 13.00c f.o.b. 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 lbs. and over 58.50c del.; 500-999 59.00c; 200-499 59.56c; 100-199 61.00c.

Tin Crystals: 400 lb. bbls. 39,00c f.o.b. Grassell, N. J.; 100-lb. kegs 39,50c.

Sodium Stannate: 100 or 300-lb. drums 36.50c, del.; ton lots 33.50c.

Zinc Cynnide: 100-lb. kegs or bbls. 33.00e f.o.b. Niagara Falls.

Brass Mill Allowances: Prices for less than 15,000 lbs. f.o.b. shipping point. Add %c for 15,000-40,000 lbs.; 1c for 40,000 or more.

Scrap Metals

	Clean	Rod	Clean
	Heavy	Ends	Turning
Copper	10.250	10.250	9.500
Tinned Copper	9.625	9.625	9.375
Yellow Brass	8,625	8.375	7.785
Commercial bronze	0.010	0.010	1.100
90%	9.375	9.125	8.625
95%	9.500	9.250	8,750
Red Brass, 85%	9,125	8.875	8.875
Red Brass, 80%	9.125	8.875	8.375
Muntz Metal	8.000	7.750	7.250
Nickel Sil, 5%	9.250	9.000	4.625
Phos. br., A, B, 5%	11.000	10.750	9.750
Herculoy, Everdur or			01100
equivalent	10.250	10.000	9.250
Naval brass	8.250	8.000	7.500
Mang. bronze	8.250	3.000	7.500

Other than Brass Mill Scrap: Prices apply on material not meeting brass mill specifications and are f.o.b. shipping peint; add %c for shipment of 60,000 lbs. of one group and 1/c for 20,000 lbs. of second group shipped in same car. Typical prices follow:

(Group 1) No. 1 heavy copper and wire, No. 1 tinned copper, copper borings 9.75c; No. 2 copper wire and mixed heavy copper, copper tuyeres 8.75c.

(Group 2) soft red brass and borings, atuminum bronze 9.00c; copper-nickel and borings 9.25c; car boxes, cocks and faucets 7.75c; bell metal 15.50c; babblt-lined brass bushings 13.00c.

(Group 3) zincy bronze borings, Admiralty condenser tubes, brass pipe 7.50c; Muntz metal condenser tubes 7.00c; yellow brass 6.25c; manganese bronze (lead 0.00% - 0.40%) 7.25c, (lead 0.41% - 1.0%) 6.25c; manganese bronze borings (lead 0.00-0.40%) 6.50c, (lead 0.41-1.00%) 5.50c.

Aluminum Scrap: Price f.o.b. 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, wreught alloys, 2, 2.50c lb. Other high-grade alloys 3.50, 4.00c lb. Mixed plant scrap, all solids, 2, 2.500 lb. borings and turnings one cent less than segregated.

Lead Scrap: Prices f.o.b. point of shipment. For soft and hard lead, including cable lead, deduct 0.55c from basing point prices for refined metal.

Zine Scrap: New clippings 7.25c, old zine 5.25c f.o.b. point of shipment; add ¼-cent for 16,000 lbs. or more. New die-east scrap, radiator srilles 4.95c, add ½e 20,000 or more. Unaweated zine dross; die cast slab 5.80c any quantity.

Nickel, Monel Scrap: Prices f.e.s. point of shipment; add ¼c for 2000 lbs. or more of nickel or cupro-nickel shipped at one time and 20,000 lbs. or more of Monel. Converters (dealers) allowed 2c premium.

Nickel: 98% or more nickel and not ever 1/2% copper 26.00c; 90-98% nickel, 26.00c per lb. nickel contained.

Cupro-nickel: 90% or more combined nickel and copper 26.00c per lb. contained nickel, plus 8.60c per lb. contained copper; less than 90% combined nickel and copper 26.00c for contained nickel only.

Monel: No. 1 castings, turnings 15.00c; new clipping 20.00c; soldered sheet 18.00c,

Now is the Time to Isolate Costly Punch Press Vibration

Four Korfund Type SL/H Vibro-Isolators effectively absorb the shock from this Bliss 100 Ton Capacity Press

> You can't operate punch presses without vibration. Whether you realize it or not, uncontrolled vibration takes a constant toll in building damage, machine breakdowns, accidents, spoiled work and lowered employee efficiency.

> But there is no reason why you can't be protected from vibration. Vibration can be isolated completely—and economically through Korfund Vibration Control.

> And the logical time to take advantage of the simple, sure results of Korfund Vibration Control is while presses are shut down during your reconversion period.

> Ask for a Korfund Vibration Control Engineer to recommend the proper isolators for your equipment. We have representatives in principal cities. In the meantime, ask for Catalog H-600.



Sheets, Strip . . .

Sheet & Strip Prices, Page 164

Demand for sheets and strip shows no easing and producers continue to divide output among consumers to spread the supply to best advantage. Ending of the coal strike will be of some advantage. though time will be required to get back to normal output. Mills are booked well into next year on most grades and some have ceased making definite delivery promises.

Pittsburgh-Establishment of Youngtown as a base on hot-rolled allov strip by Carnegie-Illinois Steel Corp. for the sizes produced there will result in a lowe net delivered price to consumers within that immediate area, as Canton and Ma-sillon were formerly the nearest bases. There has been no easing in volume d new orders, despite extended deliveries. In polished stainless sheets, and in electrical, enameling and galvanized items many sellers are booked into second quarter. Production schedules on sheets and strip held well last week in contrast with other steel products, such as bats, plates, rail and structural items. However, if the calling off of the coal strikes had not occurred when it did, sheet and strip output would have been reduced toward the close of the week. There has been no significant let-up in pressure for sheet and strip deliveries. A chief concern of sellers is to distribute available steel production to meet essential requirements of customers with an eye to maintaining prewar customer relationships. Many consumers want pro-tection on mill schedules well into ner year, but some producers refuse to make definite commitments that far in advance.

The Navy's Material Redistribution ar Disposal office here recently advertise for bids on slightly over 17,500 pount of various stainless steel sheet specific tions, covering a wide gage range.

Chicago — Curtailment in steel preduction because of the coal strike he lowered output of sheets, with the rest that deliveries are extending. Demax continues high, and most mills at booked on all grades through first quiter of 1946. Consumers press for de liveries. nevertheless, and appear be doubt that mills are as heavily loaded at they maintain. It is true that then have been heavy cancellations recents, but these represent tonnage already supended when the war ended and cosequently not counted in mill schedules.

New York — In addition to continue strong demand, sheet production is m being adversely affected by fuel sharage, with the likelihood that the sitution will become tighter before it in proves. During the past few days increasing number of sellers withdre from the market temporarily on sumajor products as hot and cold-rolet galvanized and silicon sheets.

With the situation becoming tight an increasing number of mills are setting up quota systems, a program made puticularly difficult at this time, howen because of the fuel situation for the cannot tell with any assurance with their quotas are likely to be a few month from now. About the best they can be some producers assert, is to set up quota with the clear understanding the even this might have to be revised late. Two mills, which have been applying the quota system since the end of the war. already find they are forced to reduce their first quarter quotas. In view of the fact the quota system had been set up so as to give regular customers the nearest possible approach to definite delivery promises, this matter of having to reduce rations is becoming somewhat embarassing. However, it is admitted that dominating factors in this situation are beyond control of mills.

St. Louis — Flat-rolled steel production continues limited to about 70 per cent of normal because of increasing labor shortage. Orders are increasing, with most pressure on light gages. Backlog exceed those of the war peak. Delivery promises are in second quarter of 1946 for hot-rolled, September, 1946, for electrical sheets and galvanized promises are indefinite.

Birmingham — Sheet output now is at more than 80 per cent of capacity. Deliveries are being extended and pressure for delivery is increasing. Warehouses seek more tonnage to meet demands from agricultural users.

- Another wave of mill re-Boston scheduling confronts producers of sheets and strip as a result of retarded output and lengthening deliveries. Demand for fat-rolled products is unabated, pressure hat-rolled products is unabated, pressure for delivery is increasing and prospects for meeting demand is more confused. Some mills have withdrawn delivery promises and others accept orders on a quota basis by districts. The pinch in supply of hot strip for cold rollers in marrow sizes is developing with contin-uance of curtailed production because of the coal strike cutting into semifinance of curtailed production because of the coal strike cutting into semifin-ished steel volume. Inventories are lim-ited and much unbalanced, with cold rollers filled well through first quarter. in numerous cases inventories held by abricators are also fading rapidly, which endances reconversion programs in a endangers reconversion programs in a growing number of instances. Adding to complications is a substantial volume of carryover tonnage, some due in Au-gust, which in turn was held over from july because of inventory limitations, but now coming through. Mills are seek-ing cancellations on some of this. Applications for CC ratings, created to break bottlenecks, also are appearing. Pickling and oiling departments range up to two months behind schedules. This overhang of unshipped tonnage threatens in cut into November and December schedules. Basing point revisions on hot-rolled alloy strip thus far have been oaly a minor influence, if any, on the three major consuming points in this area, Pawtucket, R. I., Wallingford, Conn., and Boston. Impact of any change which might make Bridgenort Count. which might make Bridgeport, Conn., a basing point for hot strip would be an important factor in delivered prices, however.

Cincinnati — Sheet production in this district is maintained at established high levels, unaffected so far by the coal shorage. However, one blast furnace is ide. Demand for sheets is far beyond supply, and mills are asking customers to specify actual needs so that tonnage may be stretched as far as possible. Some interests decline to make delivery promises until the first quarter situation can be appraised.

Steel Bars . . .

Bar Prices, Page 164

With the fuel shortage limiting steel production bar mills are producing at

NATIONAL CITY BANK

THE

OF CLEVELAND

Statement of Condition

SEPTEMBER 29, 1945

ASSETS

Cash and Due from Banks	\$ 98,662,495.30
United States Government Obligations	
Other Securities	
Loans and Discounts	
Investment in Banking Premises	1,550,000.00
Customers' Liability on Acceptances and Letters	
of Credit	1,491,770.37
Accrued Interest	1,021,499.63
Other Assets	354,357.82
	\$452,910,970.20

LIABILITIES

Capital Stock (562,500 shares)	\$ 9,000,000.00	Bring sing -
Surplus	11,000,000.00	
Undivided Profits	1,800,469.58	\$21,800,469.58
Reserves		3,043,657.81
Dividend on Capital Stock Payal	196,875.00	
Acceptances and Letters of Cred	1,491,770.37	
Accrued Interest and Expenses.	1,051,164.64	
Deferred Credits and Other Liab	370,382.17	
Corporation, Individual and Bank Deposits	\$293,443,686.74	
Savings Deposits	47,205,504.83	
Trust and Public Deposits	21,561,050.21	· /
U. S. Government War Loan	Sector Party	
Account	62,746,408.85	424,956,650.63
		\$452,910,970.20

Contingent Liability on unused

loan commitments \$33,805,280.67

NOTE: United States Government obligations carried at \$87,589,252.07 are pledged to secure trust and public deposits, U.S. Government War Loan account, and for other purposes as required or permitted by law.

1845-ONE HUNDREDTH YEAR-1945

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

a lower rate and schedules are being further extended on steel bars. As a result shipments are falling behind promnew orders are be-later promise. Smaller and ises given ing in most demand and sizes ате some producers are entirely out of the market on these diameters. Many mills are booked for entire first half, with others able to do a little better on hotrolled carbon bars in small sizes. Medium diameters are somewhat easier.

New York — With production hit at various points by the fuel shortage, scarcity in hot carbon is becoming more pronounced. Not only are producers falling further behind on current commitments, but are quoting farther ahead than ever on new orders. As a matter of fact, some sellers are out of the market temporarily on certain sizes, especially smaller diameters. Deliveries on small sizes have become far extended. with some mills booked up for the entire first half, or at least well into May or early June.

On the medium sizes the situation is not so tight, with March and in some cases February still being quoted. As a matter of fact, some tonnage in the small specifications can be picked up for late first quarter, but this is the exception. The position on large rounds is still easier, as compared with other sizes. January and February can be done without too much difficulty and one large interest still has some capacity available for December. However, the overall position in hot carbon bars is tighter.

The situation in cold-drawn bars is



mixed and on the whole somewhat easier. At least some small and medium sizes can be picked up in January and February, with sizes above 1% inches or thereabouts, available in some quarters late this year. This, in general, repre-sents less extended delivery schedule. Hot alloy bars can be had in six week, with deliveries little more than holding their own.

Boston-Slight improvement in larger sizes of hot-rolled carbon bars from Buffalo, in late November, is not general Most suppliers are filled through fourth quarter on hot-rolled carbon bars, and well beyond on smaller sizes. While cold-drawn schedules are filling for fix quarter at least one cold drawing ba shop is practically out of stock for converting. Alloy buying lags. Forge shops have swung more to carbon from alloys for reconversion requirements and to a smaller range of sizes. Forge shops in other instances have gone from NE grades to SAE. Requirements for small forged tools are stronger but bolt and nut demand for the moment is less active.

St. Louis - Barmakers report increasing labor distress, forcing continued de-cline in production. Orders are at a pace unexpected to mills. Disparity between demand and output is reported far greater than during the war. Greatest pressure is on' small bars and consumers are being refused or are being given only indefinite delivery promise. Mill schedules have been extended to the middle of 1946 or beyond. Pittsburgh—Establishment of Youngs-

town as a base by Carnegie-Illinois Steel Corp. for the range of sizes produced there of hot-rolled bars and small shape will result in a slightly lower net de livered price for consumers in that area and will nullify the former Mahoning Valley base delivered price set-up the points involved on those produced produced by Carnegie at Youngstown. A greater saving will accrue to cut tomers as a result of the new base = Youngstown on hot-rolled alloy best and spring steel flats, for there was to Mahoning Valley base delivered price on these products, with the nearest base for consumers in the Youngstown are at Canton and Massillon. Demand for carbon bars remains com-

paratively strong, particularly from attomotive, railroad and farm implement industries. Mill deliveries on small size extend well into first quarter, with some what earlier promises available on large rounds. Production was off sharply las week, with the largest producer's m. completely down and operations at othe ponts on reduced schedule. It will be late this week before significant in provement will be possible. Reduction production will force mills to car over considerable October tonnage November and will correspondingly fect later schedules.

Philadelphia - Demand for hot-rolle carbon bars is still focused principaon lighter sizes, with most sellers que ing May and June. Some are not que ing at all until they can gain a dear picture of the situation. However, m dium and larger sizes are quoted in sur cases for late February and March. The situation in cold-drawn bars appear somewhat easier than a fortnight age with offerings on small as well as large sizes being made in some quarters for

January and February. Deliveries may stiffen, however, for recently some producers of hot-rolled bars have reduced cold drawers' quotas. Hot alloy bar shipments show little change, sellers generally quoting eight to ten weeks, although in some cases better can be done.

Steel Plates . . .

Plate Prices, Page 165

Labor interruptions limiting coal supply have resulted in reduction of plate production and consequent lengthening in delivery time. Demand is good and would be heavier if it were possible to obtain more light plates for underground tank construction.

Pittsburgh — Sharp curtailment in plate production occurred here last week and still further reduction is indicated should the coal strike continue. Carnegie-Illinois Steel Corp.'s plate mills were shut down last week, and operations at other plants were substantially reduced. Demand by railroad car and locomotive builders and in heavy construction lines is better than anticipated. Miscellaneous ship repair work also is an important factor. Mill deliveries are extended into late December and Janury, with further extension in delivery promises probable because of reduced production.

New York — While eastern plate mills continue to operate, some units in the Middle West are reported down as a result of the coal strike, and deliveries, consequently, have lengthened. In general, little tonnage is now being offered before January and at least two producers have nothing available in sheared plates before February.

Demand is fairly active and were it possible to get nearby deliveries on light plat for underground fuel oil storage tank, orders would be much heavier. At present, most producers have little to offer in light sheets before late January or February.

Tank fabricators report some improvement in municipal tank work, and most report that they could operate at a higher rate if more steel were available for the deliveries desired.

Boston -- Plate orders tend upward slightly, with lighter gages for small tanks and boilers predominating. Demand for light stock is so pronounced that backlogs are somewhat unbalanced. Formerly supplied from strip mills, most tonnage in these sizes and widths now is loading plate mills, with deliveries mainly in January. A large share is 2016 and 10 mills 4-inch material. Railroad buying and miscellaneous industrial demand are irregular. Fabricators in the atter class frequently have substantial inventaries from war contract cancella-tions, Shipyard buying has all but haltd, with surplus stocks at Groton, Conn., and Quincy, Mass., yet to be fully liqui-dated. Most surplus shipyard plates are high tensile and move slowly to regular channels, due in part to different welding technique required. Large diameter pipe requirements are light, exclusive of a 400-ton contract being fabricated by a Holyoke, Mass., shop. Producers of heads have put into effect the 8 per cent increase recently approved by OPA for stamped and pressed stock, there be-ing no revision for spun heads. Against unrated orders placed before expiration



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of CMP, plate deliveries are considerably heavier.

Birmingham — Shape demand holds its high level and mills are as close to capacity as conditions will permit. Fabricators are booked solidly for several months.

Philadelphia — Plate mills in this district are booked solidly into next year on sheared plates, with at least one producer having nothing to offer before February. Scarcity of light plates continues, primarily because of demand for underground fuel oil storage tanks. However, most gages are moving fairly actively, with export requirements a continued factor. Pressure on eastern mills has been increased recently because of suspension at some plants in the Pittsburgh and Youngstown districts. With miners scheduled to return to work Oct. 22 this situation may change soon. One eastern producer, in line with a program planned sometime ago, has closed down his universal mill indefinitely.

Seattle — Plates continue in good demand, several water tank and steel pipe projects being up for figures. McMinnville, Oreg., has reinstated its contract with Beall Pipe & Tank Co., Portland, for construction of the final five miles of a 10-mile 16-inch water main costing about \$80,000. The first five miles were built before the war. Chicago Bridge & Iron Works has a \$518,000 project at Fort Peck, Mont., for a penstock wye for the power plant's second generating unit.



The above illustration shows a machine developed for use in charging aluminum melting furnaces and ferro-silicon open top electric furnaces. It is a modification of the Brosius open hearth charging machine, and, instead of using a rotating peel and a standard charging box, we provide an open end box and a pusher head for pushing the material from the box. The open end box makes this design particularly adaptable to the charging of electric furnaces as there is much less danger of damage to the electrodes than with a rotating box.

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Tubular Goods . . .

Tubular Goods Prices, Page 165

Pittsburgh — Pipe production schedules have held up well in contrast with sharp reduction in most other steel products. Considerable seamless steel pipe is being used in line pipe construction. Larger size line pipe is promised for December delivery, with shipments a smaller specifications extended into Jauary. Low jobbers' pipe inventorialso are a factor in bolstering cure demand, while lifting of WPB contreon new oil exploration tests should se stantially increase requirements for well casings. Some improvement in a quirements for mechanical and pressutubing from railroads and oil refinereis expected to develop soon. Boston — Merchant steel pipe buying

Boston — Merchant steel pipe buyic by distributors is heavy, with consign stocks increased in anticipation of increased building activity. Plumbing supply houses also are active buyes. Deliveries are lengthening and mills and rationing supply in some instances. Butweld up to 4½-inch is in May with some mills, while others quote April, while is quite general. Electric weld tubin is available late this quarter. Overal production of merchant pipe is down to about 65 per cent, due to a variety of reasons. Skelp quotas to some nontegrated mills are reduced sharply be suppliers since elimination of CMF forcing pipemakers to seek other source which are already heavily filled. Boltube deliveries are in December, as he been the case for some weeks.

Wire . . .

Wire Prices, Page 165

Boston — Supply of wire rods is coming tighter and deliveries are m extended, indefinite with some prod ers. Drawn wire schedules are full numerous products through first quarincluding specialties. Nail deliveries in March and bale ties in April. (drawn wire at least one outside produis withdrawing on a Worcester base this territory.

Chicago — A slight recession in emand for nails is observed, but all ouwire products are specified in voluexceeding production. All inventoare at low level. The large order -2000 to 3000 tons of galvanized wire 64,000,000 can keys is still unplaced, a cording to reports.

cording to reports. Birmingham — Wire production is about 75 per cent of capacity, with evcially brisk demand for wire fencing = nails, both of which are in unusus small supply among distributors.

Rails, Cars . . .

Track Material Prices, Page 165

New York — Missouri-Kansas-Te and St. Louis-San Francisco raileach has closed for a 12-car stream passenger train with Pullman-State Car Mfg. Co., Chicago. The same rueach has placed a 2000-horsepower sel-electric locomotive with Electrotive Division of General Motors Car La Grange, Ill.

La Grange, Ill. Joint orders have been placed with Edward G. Budd Mfg. Co., Philadel by Chicago, Burlington & Quincy, Dr. ver & Rio Grande Western and Wester Pacific for six stainless streaming trains of ten cars each for service between Chicago and San Francico. They will be diesel powered.

An inquiry from the Nickel Plate for 500 box cars and 100 hopper cars is outstanding in recent car demand. Meanwhile, orders have been light since September, when a new peak in freight car buying was established for the year to date. The City of Detroit has closed bids for 75 trolley cars.

Prices on light wrought steel wheels were advanced Oct. 16, section 83-C wheels being increased \$3.30 to \$21.80, Pittsburgh, and section 33-D wheels \$3.60, to \$23.60.

Structural Shapes . . .

Structural Shape Prices, Page 165

Fitsburgh — Inquiries for miscellaneous plant expansion programs continue active with further improvement indicated as present shortage of engineers and draftsmen eases. Contractors are shopping around to obtain earliest mill deliveries possible. Mills are scheduled on most structural items well into first quarter, some into April. A further extension in delivery will result from recent curtailment in production schedules due to coal shortage. Structural mills of the largest producer here were shut down last week from this cause.

Boston — A flurry in fabricated structural steel contracts is subsiding, with inquiry less active, due partly to delays in estimates for several large-tonnage projects. Uncertainty as to costs and lack of draftsmen are factors. Contracts placed approximate 2000 tons exclusive of small lots. Demand for plain material is brisk with more mills in February un additional sizes. Structural mills are bring production from the coal strike, several Pittsburgh district units being down. Producers are parceling out tonuage on a quota basis. This tightening, with extended deliveries, continues to enable producers permitted a premium to get a higher price, usually on delivery basis.

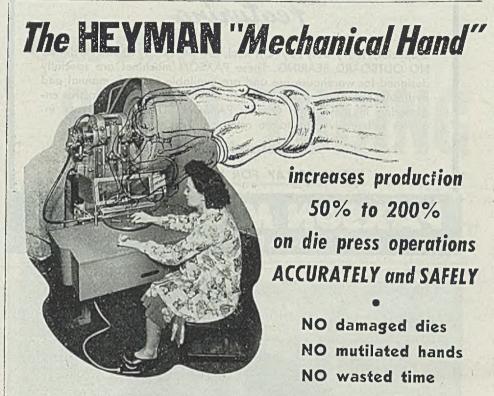
Binningham — Plate output continues close to capacity, although considerably less tonnage is taken by shipyards. Tank mutacturers account for a heavy tonnage and light plates also are in strong demand.

Philadelphia-Despite easing in structural demand recently, pending clearer outlook on wages and material shipments, shape tonnage has been sufficienty settined to force further extension in mill schedules. All leading producers now quote February shipment, with bookings for that month filling rapidly. Seattle - Prospect for structural steel is promising, several bridge projects nearing the bidding stage. The Narrows bridge, largest of these projects, will be up for bids early next year. Pierce ounty, Washington, plans a \$409,000 bidge at Fox Island to connect with the Narrows span. Bethlehem Steel Co. has plans for a steel structure 80 x 415 leet in Scattle, to cost about \$90,000. Bureau of Reclamation has called bids at Denver Oct. 29 for a bulkhead gate lifting frame for Grand Coulee Dam. Kaiser Co. is negotiating with the French government for construction of six 260foot steel coasting ships for Indo-China, to be built at Swan Island.

Reinforcing Bars ... Reinforcing Bar Prices, Page 165

New York — More than 1000 tons of reinforcing bars are being figured for a New Jersey state highway project, running from Port St., Newark, to North Ave., Elizabeth. This is the largest of several New Jersey state highway projects. Bids will be opened soon. In addition 875 tons of structural steel will be required for bridge work, consisting of five over-passes and two pipe culvert extensions.

Pittsburgh — Sharp curtailment in reinforcing bar rolling schedules here has occurred, with the largest producers' schedules down completely and operations at other plants sharply reduced. This has forced a further extension in mill delivery schedules. It now appears probable that shipments scheduled for November will not be made until December, with other months correspondingly pushed back. In most instances sellers are booked into second quarter and there is only a relatively minor reduction in new inquiries despite the extended delivery promises. Export inquiries represent a substantial proportion of new work, and present a serious problem in scheduling, for domestic business is large with contractors pressing for early delivery. Most export shipments are for South America, and represent only a small portion of pent-up demand accumulated during the war. Seattle — Demand for reinforcing



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steel is increasing and much new basness is in prospect. Rolling mills and clearing up backlog of merchant ban for which demand has dropped, while reinforcing steel is coming back. Sean Roebuck & Co. plans a seven-story addition to its Seattle plant, requiring about 500 tons of reinforcing steel. Seat plans a \$1 million public safety bulk ing, which will require a large tomag of reinforcing steel and shapes.

Pig Iron . . .

Pig Iron Prices, Page 167

Ending of the coal strike holds poise for return to normal in pig iron pduction, though it will take some be for sufficient coal to become availto supply stacks now banked. No ctress has occurred among pig iron me ers, though some shortages have dee oped and reserves for winter are m being set aside.

Pittsburgh — Pig iron products dropped here last week with a furth reduction in operations by Jones Laughlin Steel Corp. at Aliquippa a Pittsburgh. Only 25 out of 54 furnar were in operation here last week, wi some of the active units on reduc wind. A sharp rebound in blast fume operations is expected this week, a though it will be late in the week. For dry operations were not affected set ously by the coal shortage, as meaning fairly large stocks of found coke. Indicative of the sharp reduct in coke output the past few weeks, the Clairton works of Carnegie-Illinois Str Corp., which supplies most of the gas and coke for the Corporation's erations in this district, was operate at 25 per cent of capacity last wa Trade interests do not expect an et resumption of operations of the Streers Iron & Steel Co.'s furnace. This nace, which was recently purchased the J. H. Hillman interests of Pittsbur is now banked. Ore stocks at this nace were completely used prior to move.

Chicago — Although no instances known where foundry melt has been duced from lack of iron, inventories become dangerously low in many day because of curtailed shipments foling banking of blast furnaces as resof the coal strike. Foundries have here order backlogs for castings and the mpower situation is improving slowly that the melt is expected to increase supply will permit.

New York — As coke is even scar than pig iron, reduction in foundry in this district is due primarily to of coke, notwithstanding the fact pig iron shipments are being curfue In an effort to ease the situation what the War Production Board put effect Oct. 15 a regulation limiting c supply to 20 days, as against no previously. In other words, the conscannot order another carload of cuntil his supply has dipped below limit. Also at the beginning of month the 30-day limitation on pig stocks was reinstated.

Meanwhile, prospects are for a funreduction in foundry melt, as settlered of the soft coal dispute still appears to tant. Water shipments of pig from from Buffalo have been held up temporarih-St. Louis — Pig from production

St. Louis — Pig iron producers le

/TEE

miners in this district may join the eastern coal strike. Pig iron demand continues heavy but melters are in no distress. All inventories are low. Producers are complying with an unofficial WPB request that iron be rationed to spread the supply.

WPB request the supply. Binningham — Pig iron production is at capacity by merchant furnaces and demand is consistently close to output, though no actual shortage has been met. Rumors are that an early increase is expected by furnace interests.

pected by furnace interests. Boston — Several pig iron consumers with permit to stock more than 30 days supply in anticipation of winter shortage have been turned down by furnaces on additional tonnage. Two blast furnaces in addition to the district unit supplying this area are down. Basic consumers are operating on hand-to-mouth reserves and subcontracting by foundries spreads the melt over a wide area. At the moment supply is sufficient for current melt but consumers are becoming more pessimistic as to balance during the months ahead. By-product coke production by the largest interest in this section is down to 50 per cent of capacity. The district funace will be unable to fill emergency demand this winter.

Cincinnati — Foundry melt in this district has not yet been curtailed although the coal shortage has caused anxiety. Reserves of pig iron and coke are not large and operations will react quickly to any curtailment. Foundries have increased the proportion of scrap as a means of conserving pig iron. Supplies of by-product foundry coke have been ample to the present time for actual needs but cannot meet panic buying or be sustained in face of acute coal shortage.

Boston — Pressure for basic pig iron hom non-integrated mills had eased slightly, now that miners will return to work Oct. 22. However, the situation still is tight, with more inquiry than producers will be able to handle for some time. Additional furnaces were banked recently as a result of fuel shortage.

Buffalo — Lack of coal forced pig iron producers to curtail operations further, heidehem Steel Co. banking two stacks a Lackawanna, N. Y., and Hanna Furmace Co. banked one. With other furmaces down for relining the district pig for rate fell to 59 per cent of capacity, with only 10 of 17 stacks active. Merchat iron sellers report conditions were as bad as might have been expected, as shipments were made only to melters who had coke and could use the iron.

Scrap . . .

Scrap Prices, Page 168

Scrap holds its strong position, aided by increased use in steelmaking while pig non supply was limited as a result of the coal strike. Some time will be required to get back to normal in pig im tonnage. Prices are strong at ceiliess and supply is somewhat limited, mot melters being unable to build usual backogs for winter.

Chicago — Although steel production is down sharply, due to the coal strike, denand for scrap has continued strong. This is explained by the fact that banking of many blast furnaces from coke shortage has required mills to lean more heavily on scrap and to the fact that supply is short. With winter close at hand, this is the time when enlargement of inventories is normal. Another indication of scrap strength is obtained from review of the railroad scrap picture. Recently, consumers have offered maximum price of \$19.75 for material delivered, but now are again taking it on the basis of "on track." Although heavy melting steel is most eagerly sought, the less desirable grades have gained strength.

Pittsburgh — Movement of scrap in this district is relatively insignificant, with mill operations at the lowest level since 1932 depression days, due to shortage of coal. However, mill operations are expected to rebound sharply by late this week, which should prompt some new scrap buying. On the small tonnage currently moving full ceilings are being paid with as high as \$1.25 freight equalization on heavy melting grades. A freight equalization of 50 cents is also being paid on machine shop turnings. Leading scrap interests forecast a very tight supply situation over the winter for many larger steel producers. Dealers have little material in yards, and are still short of manpower, while mill stocks are well below normal. Cast iron and low phos continue critically short, with operations at some points threatened by lack of this material.

Buffalo — Increased strength was shown in the steel and iron scrap market when steelmakers increased scrap consumption to maintain steel production when coke shortage limited pig iron output. A leading consumer recently placed



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an order for 10,000 tons locally. With many industrial plants still in the reconversion stage turnings are in small volume. An order for alloy-free turnings has been refused because they were not available. Dealers report ample stocks to cover orders for other steelmaking grades. Another cargo of 5000 tons has arrived from the head of the lakes.

Philadelphia — Decision of soft coal miners to resume work is reflected in greater interest in heavy melting steel. Until recently consumers were hesitant to place orders because of possibility of early suspension of operations. Two mills, in fact, held up shipments on old orders. However, they are now inquiring more actively and continue to keep up brisk demand for turnings, which are scarce. Unprepared melting steel scrap is being offered in increasing volume. Landing mat steel, in particular, is attracting some fairly good prices. Recently about 40,000 tons of landing mat steel from Europe have been sold at Norfolk and Boston, with the 8000 tons disposed of at the latter port bringing full ceiling levels. This landing mat scrap is said to have been in unusually good condition. Still heavier tonnages are in prospect.

St. Louis — Scrap shipments have improved about 5 per cent in the past two weeks but still are no better than 80 per cent of normal. Dealers expect a further shrinkage by winter. Mill reserves are reported comfortable and no new buying is being done, although no orders are being canceled. Rails, heavy melting grades and cast scrap are in most demand. Open-hearth users are paying a \$1.50 springboard, which limits distance. Prices are at ceilings except for borings and turnings.

Los Angeles — Except for cast grades scrap is plentiful. Dealers are buying from surplus stocks, mainly of Maritime Commission origin. Mills are competing to some extent, with most lots going to yards. A recent sale of 32,000 tons of unprepared heavy melting steel went to a dealer at \$6.75, almost \$2 above the best mill bid. Prices are far below ceilings except for cast.

Birmingham — Scrap is becoming increasingly tight, partially due to Tennessee Coal, Iron & Railroad Co. entering the market because a blast furnace had been taken off. Prices are strong at ceiling and expected to remain there for some time.

Boston — Steelmaking scrap grades are at ceiling, with unprepared heavy melting firmer at that level. Demand for top grade carbon scrap is steady but buying is on a somewhat more cautious basis. Cast scrap is scarce and consumers are unable to build inventories.

At \$11.55 a gross ton, Port of Embarkation, South Boston, H. Klaff & Co., Baltimore, has been awarded 7836 gross tons of unprepared heavy melting steel scrap by purchasing branch quartermaster, Fort Devens, Mass. This is ceiling on a basis of \$15.05, Boston, and \$3.50 a ton for preparation. Scrap is to accumulate and move at a rate of 20 to 25 cars daily. Luria Bros. also bid \$11.55 and the award of the tonnage was by lot.

Cleveland — Scrap continues in tight supply and prices hold at ceilings. Shortened steel production as a result of the coal strike has not yet caused suspen-



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sion of shipments to steel mills, though this would be logical if the condition becomes more acute. Some blast furnace scrap bought for Youngstown has been diverted to other points as stacks were shut down there for lack of coke. Supply is much below normal requirements and dealers have difficulty meeting needs of consumers.

Cincinnati — Scrap iron and steel have turned much stronger as a result of the coal shortage. Especially keen is demand for blast furnace grades and cast. A feature is the current ready absorption of materal released by cancellations. Light stocks in hands of dealers form another factor, at the start of a season unfavorable to collections, in making for market strength.

Warehouse . . .

Warehouse Prices, Page 166

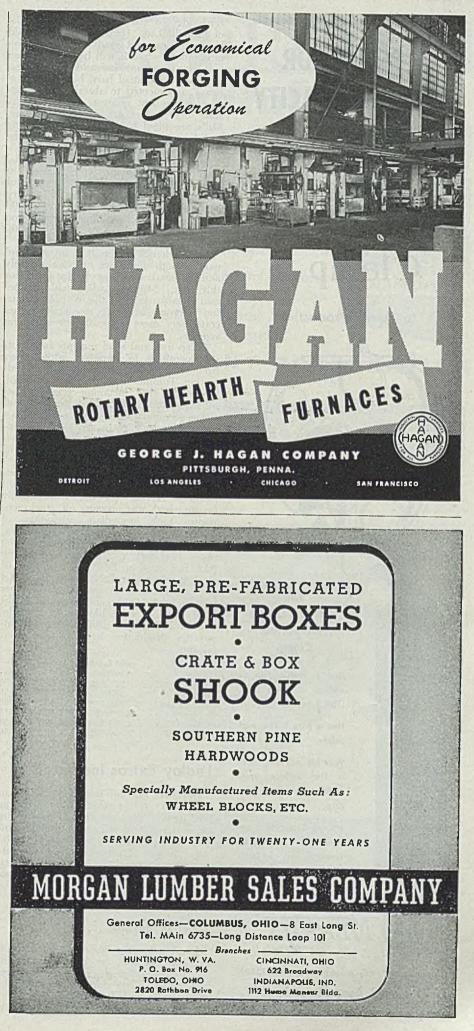
Boston — Inquiry for steel from warehouse is well maintained but unbalanced inventories and shortage of sheets and strip retard sales. Structural shape supply also is limited and mill replacements are not improved on most products for which demand is best. The heavy load on mills, with lower production, is relected in warehouse share as producers are increasingly spreading available tonnage among as many consumers as possible. Alloy demand is slow, also plates, and replacements and inventories for both are inproved. Floor plate stocks are also balanced. Tool steel inquiry is slack. In flat-rolled products and to some extent in carbon bars, inquiries tend to larger orders, due to extended mill deliveries.

Los Angeles — Sheets, wire and bars continue in short supply. Sales volume shows little change from week to week, though a gradual upturn accompanies reconversion. Dealers see no improvement ia mill deliveries until early next year, possibly spring.

Greinnati — Sales of warehouse steel are so heavy that volume for the month may near wartime peak. However, stocks are unbalanced by inadequate mill replacements in light sheets, bars and structurals. Galvanized, as heretofore, is far short of demand. Individual orders tend larger as mill deliveries fall behind reconversion plans.

Canada . . .

Toronto, Ont. — Steel buying is developing at accelerated rate in the Canadian markets, with practically all placements for first quarter delivery. As far as the current market is concerned there has been no easing in steel supply, and the swing to peace production has been retarded through lack of sufficient raw materiale. Buying is not confined to any special steel item, but is well spread through all commodities. Repairs to during, but this handicap is expected to be overcome before the end of the Year and both primary output and rolling mill production should move well abre its present level of approximately to producers have accepted large tonnages for first quarter delivery, but still have some unfilled capacity during that pered, although books are filled for the



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remainder of the year. The Steel Co. of Canada Ltd., Hamilton, Ont., should have its new unit ready for production next month when it will be in a position to increase output and add larger sizes.

Demand for steel bars, both light and heavy, is expected to absorb all production during first quarter and barmakers state that orders are in large volume. Mills are filled to the end of this year and delivery extends three to four months on carbon bars.

Merchant pig iron sales lack special feature, but demand is sustained at around 8000 tons weekly. Shortage of iron scrap is stimulating sales of foundry iron and these grades moved up to 6000 tons for the week, while malleable iron dropped to 1500 tons and basic to 500 tons.

Little change is reported in wire and nails. Both lines are in tight supply and wiremakers report books filled for this year. Most Canadian nail production is earmarked for the Wartime Housing program with the result that other consumers meet difficulty in obtaining supplies.

Scrap iron and steel receipts from outside continue to improve, while those from local plants and other sources adjoining Toronto have dropped off, with the result that incoming scrap is not sufficient to meet current demand and allow accumulation for winter use. Cast scrap and stove plate are in short supply and dealers are spreading these materials as far as possible to take care of customers.

Both iron and steel production in Canada in August dropped to the lowest monthly average for the year, mainly because with war pressure off, steel companies took immediate advantage of slackening war demand to make necessary plant repairs. For August pig iron production fell to 60.5 per cent from 65.1 per cent in July, while output of steel ingots and castings moved to 74.4 per cent of rated capacity from 75.8 per cent in July. At the end of August eight blast furnaces were blowing in Canada, one banked and five blown out. Comparative production figures in net tons follow:

			Steel Ingots Castings	, Pig Iron	Ferro- Alloys
A	ugust,	1945	 224,928	139,815	15,853
Ju	ly, 1	945	 229,161	150,387	15,750
A	ugust,	1944	 246,755	151,452	18,808
8	Mos.	1945	 2,049,707	1,232,162	130,275
8	Mos.	1944	 1,993,756	1,266,979	124,558
8	Mos.	1943	 1,996,481	1,184,064	151,630

Ledloy Extras Increased

OPA has granted Inland Steel Co. an increase in extras which it may charge for Ledloy (lead-bearing free-machining) carbon steel bars, plates and semifinished material, effective Sept. 25. The extra on bars is advanced from the former 10 cents per 100 pounds to 25 cents, on plates from 20 cents per 100 pounds to 35 cents, and on billets and slabs from \$3 per gross ton to \$5.

Steel in Europe . . .

London — (By Radio) — Sheet mills in Great Britain are operating to capacity to meet increasing needs of reconversion. Plate demand is increasing, with heavier calls from ship builders and boilermakers. Labor shortage in foundries retards needed expansion in production of light castings for the building industries.

STRUCTURAL SHAPES ...

STRUCTURAL STEEL PLACED

- 6000 tons, boiler house, Sandusky, O., for Ner Departure Division, General Motors Can, to Fort Pitt Bridge Works, Pittsburgh, Mo Oct. 2.
- 6000 tons, General Electric Co. project, Syncuse, N. Y., to Lehigh Structural Steel Co. Allentown, Pa.
- 5486 tons, various locations, for Atchison, Tr peka & Santa Fe railroad; 4990 tons, time trestle caps, to Kansas City Structural Ser Co., Kansas City, Kans.; 382 tons, ber spans, to Bethlehem, Pa.; 64 tons, tumtab repairs, to Consolidated Steel Corp. of Teu, Orange, Tex.; bids Oct. 8.
- 2500 tons, Tribune Square development, Car cago, for Chicago Tribune Building Corp., American Bridge Co., Pittsburgh; R. C. We boldt Co., contractors.
- 2500 tons, assembly building and office, Jace ville, Wis., for Chevrolet Motor Car Division General Motors Corp., to American Bride Co., Pittsburgh; bids June 14.
- 2200 tons, Standard Oil Co. research develop ment, Linden, N. J., to Belmont Iron Work Philadelphia.
- 930 tons, bridge, Farley, Mo., for Chicas Burlington & Quincy railroad, to America Bridge Co.; bids Sept. 24.
- 875 tons, du Pont plant addition, Martinsvilk Va., to Bethlehem Fabricators, Bethlehem, h
- 850 tons, plant buildings, Bridgewater, Va, t Lehigh Structural Steel Co., Allentowa, in
- 800 tons, building for Hammermill Paper Co. Erie, Pa., to American Bridge Co., Pittsburgthrough Morton C. Tuttle Co., Boston, generation contractor.
- 500 tons, Vincent Memorial Building, Massat setts General Hospital, Boston, to Har Structural Steel Co., New York.
- 415 tons, carton plant, Kalamazoo, Mich, Sutherland Paper Co., to Joseph T. Ryc & Son Inc., Chicago; Miller-Davis Co., M mazoo, Mich., contractor.
- 400 tons, du Pont plant, Orange, Tex., to Ca solidated Steel Co., Los Angeles.
- 350 tons, factory building, Beall Pipe & Tr Corp., Portland, Oreg., to Poole & McGonia Portland.
- 250 tons, addition for Swank Inc., Attletor Mass., to Bethlehem Steel Co., Bethler Pa., through Temple & Crane Co., Boston
- 307 tons, heat treating building, Chicago, Ingersoll Steel & Disc Division, Borg-War Corp., to Henry E. Gremp Co., Chicago, Sept. 10.
- 170 tons, stock house, South Bend, Ind, Drewry's Ltd. USA Inc., to Midland Strutural Steel Co., Cicero, Ill.; George St Construction Co., Chicago, contractor.
- 155 tons, lighting towers, Braves Field, Base to American Bridge Co., Pittsburgh.
- 150 tons, state highway bridge, Temple Mass., to American Bridge Co., Pitter through DeMatteo Construction Co., Bos
- 135 tons, building for Forstman Woolen ^V Passaic, N. J., to Savery & Glasser, Duse N. J., through Stone & Webster, Boston.
- 100 tons, leather warehouse, Salem, Mass American Bridge Co., Pittsburgh.

STRUCTURAL STEEL PENDING

1200 tons, gymnasium, Princeton University

- 500 tons, plant for Allen B. Dumont Labertories, Clifton, N. J.
- 426 tons, highway bridge over For river Oneida street, Appleton, Wis., for Sub Highway Commission; bids Oct. 16.

400 tons, St. Luke's Hospital, Bethlehem, Pa.; bids Oct. 29.

100 tons, sand shed, Horicon, Wis., for Deere & Co.

Unstated, steel building, plant addition for Bethlehem Steel Co., Seattle.

Unstated, \$409,000 bridge at Fox Island, Pierco county, Wash.; bids soon.

Unstated, bulkhead gate lifting frame for Grand Coulce; bids to Reclamation Bureau, Denver, Oct. 29.

REINFORCING BARS ...

REINFORCING BARS PLACED

- 350 tons, expansion, Liquid Carbonic Corp., Chicago, to Ceco Steel Products Corp., Cicero, Ill.; Kaiser-Decett Co., contractor.
- 225 tons, treatment building, Jacksonville, III., for Jacksonville State Hospital; to Bethlehem Steel Co., Bethlehem, Pa., through Whitacre Engineering Co., Chicago; John Felmley Co., Bloomington, Ill., contractor; bids Sept. 25.
- 160 tons, expansion, E. J. Brach & Sons, Chicago, to Ceco Steel Products Corp., Cicero, Ill.

100 tons or more, W. O. McKay automobile plant, Seattle, to Bethlehem Steel Co.

REINFORCING BARS PENDING

1017 tons, concrete pier, Norfolk Navy Yard, for U. S. Navy.

1000 tons, building, St. Louis, for Sears, Roebuck & Co.

500 tons or more, Sears-Roebuck addition, Seattle; bids in about 30 days.

351 tons, water works, Ottumwa, Iowa.

 300 tons, sewage treatment plant, Norfolk, Va.
 250 tons, Torresdale pumping station, Philadelphia,

200 tons, expansion, Milwaukee, for Blatz Brewing Co.

140 tons, building, Indianapolis, for Central Fumilure Co.

100 tons, expansion, Morrison, Ill., for Liquid Carbonic Corp.

100 tons, hus service station, Detroit, Great Lakes Greyhound Lines.

Unstated, Public Service building Seattle; bids soon,

PLATES ...

PLATES PLACED

Ustated, five miles, 16-inch water pipe for McMinnville, Oreg., to Beall Pipe & Tank Uo, Portland, Oreg.

Ustated, penstock wye for Fort Peck, Mont., power plant, to Chicago Bridge & Iron Co., Chicago, low at \$518,000.

RAILS, CARS

RAILROAD CARS PLACED

Cheago, Burlington & Quincy, Denver & Rio Grande Western and Western Pacific jointly phred six stainless steel ten-car passenger trains with Edward G. Budd Mfg. Co., Philadelphia.

Mesouri-Kansas-Texas and St. Louis-San Francice. cach awarded a 12-car streamlined passensar train to Pullman-Standard Car Mfg. Co., Chicago.

RAILROAD CARS PENDING

Chy of Detroit, 75 trolley cars; bids Oct. 15.

Nikel Plate, 500 box and 100 hopper cars; bids asked.

LOCOMOTIVES PLACED

Missouri-Kansas-Texas and St. Louis-San Francisco, each placed a 2000-horsepower dieselelectric locomotive with Electromotive Division of General Motors Corp., La Grange, III.

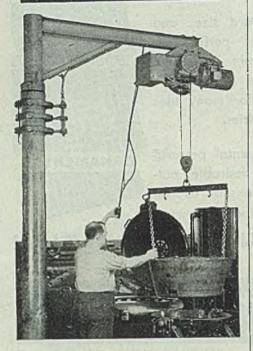


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360° JIB HOIST SPEEDS PROCESSING



Here's a materials handling problem that was solved by a Reading Electric Hoist with a 360° swing jib crane. Large quantities of metal turnings were processed for oil removal. Speedy handling was necessary.

A Reading Electric Hoist was selected for power and hoisting speed. Reading engineers also designed the 360° swing for the crane to speed up loading and unloading.

For help in materials handling problems that involve hoisting, write for bulletin, "144 Answers To Your Hoisting Problems".

READING CHAIN & BLOCK CORP. 2102 ADAMS STREET READING, PA.



CONSTRUCTION AND ENTERPRISE

OHIO

- AKRON-Summit Mfg. Co. has been incorporated to manufacture machinery, tools, dies, jigs and appliances, with \$500 capital and 250 shares no par value, by Hayden H. Renner, 1896 Fay Rd., and associates.
- CLEVELAND-Mor-Flo Heater Co., A. R. Abt, president, 2176 East 76th St., plans a 60 x 80-foot plant addition costing about \$40,-000.
- CLEVELAND—Precision Castings Co., Inc., 12600 Berca Rd., will build a one-story 75 x 320 and 50 x 100-foot plant addition, estimated to cost \$210,000.
- CLEVELAND—George F Adler Brass Foundry, 1510 University road, has preliminary plans for four foundry buildings, including 60 x 125-foot foundry, 40×125 -foot core and pattern building, 40×40 -foot furnace room and 36 x 40-foot office building, to cost about \$50,000.
- CLEVELAND—A. W. Hecker Co., 1796 East 66th St., plans an addition costing \$150,000 to house new manufacturing division for production of pumps, in addition to its regular line of jigs, fixtures and special machinery.
- CLEVELAND—Universal Wire Spring Co., 2260 East 69th St., will build a two-story 50 x 161-foot factory building and 19 x 30foot furnace building, at above address.
- CLEVELAND-Atlas Bolt Co., care E. Weit, 1120 Ivanhoe Rd., will build a one-story 30 x 59-foot shop addition.
- CLEVELAND Ohio Foundry Ço., 9812 Quincy Avc., will build a one and twostory warchouse addition at 9608 Quincy Ave., to cost \$10,200.
- CLEVELAND—Marquette Controlled Injector Co. has been incorporated with \$500 capital and 500 shares no par value to deal in fuel injection devices. James A. Weeks, 1122 Guardian Bldg., is agent.
- DELAWARE, O.—Delo Screw Products Co. will let contract soon for a one-story 80 x 250foot plant costing about \$75,000. R. Rosser, 29 East First St., is architect.
- LIMA, O.—City, City Hall, plans earthwork reservoir, pumping station and 8000 feet of 30 to 50-inch steel pipe, to cost about \$500,-000. Jones & Henry, Toledo Trust Bldg., Toledo, O., are engineers.
- LIMA, O.—City, City Hall, will vote in November on bonds for a garbage disposal plant costing about \$121,000.
- MEDINA, O.—Ivan Mackey, 1488 Parkway Dr., and William C. Reese, 4803 Ardmore Ave., both Cleveland, are seeking a site here for a machine screw products plant.
- WELLINGTON, O.-Robert Holland, care Warren Coal & Builders' Supply Co., will build a 36 x 75-foot plant for manufacture of tamper-type machines for continuous production of concrete blocks.
- YOUNGSTOWN—Ace Storm Window Co., formed to manufacture aluminum storm windows, will locate its plant at 3515 Glenwood Ave. John F. Sullivan is president. Additional equipment is being purchased.

MASSACHUSETTS

- CAMBRIDGE, MASS.—H. Levy, 186 Massachusetts Ave., has let contract to Lilly Construction Co., 262 Washington St., Boston, for a one-story 83 x 184-foot manufacturing building costing about \$60,000. C. F. Merrick, 71 Newberry St., Boston, is architect.
- FRAMINGHAM, MASS.— Framingham Pattern Works, Mellen St., plans a two-story 80 x 121-foot plant building costing about \$40,-000. E. F. Tomlinson Inc., 201 Devonshire Boston, is engineer.
- NEW BEDFORD, MASS.—Revere Copper & Brass Inc., 24 North Front St., has let con-

tract to Sullivan-Foster Inc., 43 Williams St., for a one and two-story mill addition to cost about \$45,000. Johnck & Ehmann, 104 Michigan Ave., Chicago, are architect.

CONNECTICUT

- DERBY, CONN.—Department of public work, City Hall, is having plans prepared for a sewage disposal plant costing about \$300,000. Argraves & Mort, 70 College St., New Haven, Conn., are consulting engineers.
- NEW HAVEN, CONN.—Rockbestos Product Co., Nicoll St., has let contract to Dwigh Building Co., 152 Chapel St., for a two story 110 x 150-foot plant, estimated b cost about \$160,000.
- OAKVILLE, CONN.—Autoyre Co. plans a two story 65 x 82-foot plant addition costing about \$45,000. Fletcher Thompson Inc. Bridgeport, Conn., is engineer.
- WINSTED, CONN.—Board of sewer commissioners, City Hall, Winsted, have plans under way for a sewage disposal plant and sewerg: system, to cost about \$330,000. Buck & Buck 650 Main St., Hartford, Conn., are engineer.

RHODE ISLAND

PROVIDENCE, R. I.—Seaconnet Coal Co. care C. H. Sprague & Son Co., 1141 Hapital Trust Bldg., is taking bids on a machine shop addition estimated to cost about \$40. 000.

NEW YORK

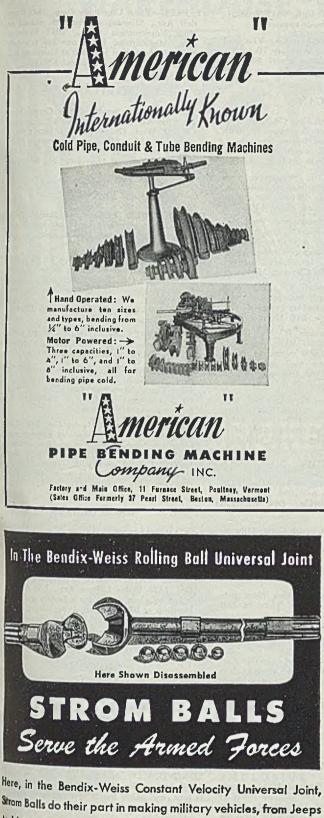
- BAYSHORE, N. Y.—Long Island Lighting (A. Old Country Rd., Mineola, L. I., plans erection of a boiler and blower building, costing \$900,000, with equipment.
- BUFFALO—Hewitt Rubber Corp., 240 Kesington Avc., will recondition Richardson & Boynton plant it recently bought and v[±] spend \$350,000 for machinery and \$150,00 on alterations.
- DUNKIRK, N. Y.--Dunkirk Die & Machi Works, J. V. Serio, manager, plans a one-stu 40 x 90-foot plant building at 214 We Lake Shore Dr., to cost about \$40,000.
- GENEVA, N. Y.—Geneva Forging Co. has general contract to Lapenta & Gressanl Ca struction Co., 554 West Colvin St., Syrare. N. Y., for a one-story 400 x 600-foot force plant estimated to cost \$700,000.
- WOODSIDE, N. Y.-U. S. Bronze Sign & Inc., 570 Broadway, New York, has let cotract to Kniser Construction Co., 100 Ed Tenth St., New York 3, for a two-stor plant estimated to cost \$60,000. Solumn & Lichtenstein, 369 Lexington Ave., Mr York, are architects.

NEW JERSEY

LINDEN, N. J.—City, City Hall, is having plan prepared for a sewage disposal plant to ten about \$1 million.

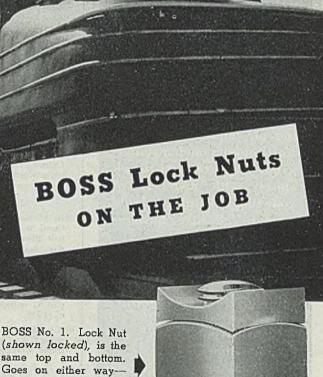
PENNSYLVANIA

- BUTLER, PA. American Rolling Mill C. R. P. Tooke, superintendent, has let or tract to McGraw Construction Co., Americ Bldg., Middletown, O., for a one-story pbuilding, including addition to normalise furnace, to cost about \$200,000, inclusiequipment. W. N. Millan, Middletown, 0. is engineer.
- ERIE, PA.—Erie Meter Systems Inc., N. Carlson, president, 2402 Pearl Ave., V. build a one-story tank shop 46 x 67 fet. cost about \$20,000.
- NEW BRIGHTON, PA.—New Brighton Fer W. S. McDaniel, secretary, plans a second disposal plant, incinerator and interresewers, estimated to cost about \$350.000.
- NORRISTOWN, PA.-Norristown Boro, Ber Hall, plans sewage treatment plant contra



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about \$500,000. W. A. Goff, 1617 Pennsylvania Blvd., Philadelphia, is engineer.

SHARON, PA.—Frantz Machine Co., Vine and F anklin St., will build a two-story 70 x 111foot plant addition costing about \$45,000. Clepper & Clepper, 27 Vine St., are architects.

MICHIGAN

- ADRIAN, MICH.—Speedee Shoe Co., 320 West Maumee St., has been incorporated with \$10,000 capital to manufacture horseshoes, tools, dies, gages and machine parts, by Howard Emery, 207 North Scott St., Adrian.
- ALGONAC, MICH.---W. E. Warner & Sons have let contract to Cunningham-Rudy Co., 3087 West Grand Blvd., Detroit, for a onesto y brass foundry, costing about \$100,000.
- DETROIT—General Rustproofing & Packaging Corp., 223 East Columbia Dr., has been incorporated with \$30,000 capital to rustproof and chemically treat metals and export packaging of commodities, by Harry Breuwer, 1114 Burlington Dr., Mt. Clemens, Mich.
- DETROIT—Michigan Broach Co., 155 West Congress St., has been incorporated with \$25.000 capital to manufacture broaches, dies, tools, jigs, by Fred Dye, 210 Murphy Bldg.
- DETROIT—General Tractor & Engineering Corp., 602 Francis Palms Bldg., has been incorporated with \$100,000 capital to manufacture tractors, motors and engines, by Harry A. Dart, 1975 North Riverside Dr., St. Clair, Mich.
- MT. CLEMENS, MICH.—Electromaster, Inc., 1081 East Atwater St. Detroit, has let contract to the Austin Co., 429 Curtis Bldg., Detroit, for design and construction of a manufacturing plant costing about \$200,000.

ILLINOIS

- CHICAGO—Auto Moulding & Mfg. Co., 2326 Canal St., will build a one-story 100 x 150foot plant. G. H. Buckley, 664 Michigan Ave., is architect.
- KANKAKEE. ILL.—A. O. Smith Corp., Milwaukee, manufacturer of steel products, will build a 360,000-source foot plant on an 82-acre site one mile south of Kankakee, to cost \$1 million and be in operation in spring of 1946.
- ROCKFORD, ILL.—City is having plans prepared for a garbage disposal plant to cost about \$100,000.

INDIANA

- FORT WAYNE, IND.—General Electric Co., 1635 Broadway, plans erection of a magnet wire plant on West State Blvd., to cost about \$3 million.
- SOUTH BEND, IND.—Board of public works. City Hall, plans a sewage treatment plant to cost about \$4 million. Consoer, Townsend & Associates, 211 West Wacker Dr., Chicago, are engineers.

GEORGIA

DORAVILLE, GA. — General Motors Corp., General Motors Bldg., Detroit, has plans by Albert Kahn Associated Architects & Engineers, New Center Bldg., Detroit, for an automotive assembly plant here, to cost about \$6,500,000.

WISCONSIN

WISCONSIN RAPIDS, WIS.—Waterworks and lighting commission has let contract to Pittsburgh-Des Moines Steel Co., Neville Island, Pittsburgh, at \$69,550 for a 400,000-gallon elevated steel water tank.

MINNESOTA

FARIBAULT, MINN. — City, T. A. Mealia, clerk, City Hall, plans sewage disposal plant to cost about \$500,000. Toltz, King & Day, 1509 Pioneer Bldg., St. Paul, are consulting engineers. ST. PAUL—Flour City Body Corp., 2947 Blasdell Ave., Minneapolis, has let contract to Ring Construction Corp., 1645 Hennepin Ave., Minneapolis, for a one and two-story 65 x 150-foot shop building at University and Raymond Aves., to cost about \$50,000.

MARYLAND

TOWSON, MD.—Bendix Radio Corp., Joppa Rd., has let contract to Davis Construction Co., 9 West Chase St., Baltimore, for a one-story 150 x 200-foot maintenance building. to cost about \$75,000. Van Rennselaer P. Saxe. 100 West Monument St., Baltimore, is architect.

TEXAS

- DAINGERFIELD, TEX.—Lone Star Steel Co., has plans under way for expansion of steel plant, including cast iron foundry, to cost about \$2,500,000.
- HOUSTON, TEX.—Reed Roller Bit Co., 4600 Clinton Dr., has let contract to Southwestern Construction Co., 3802 Calhoun St., for plant additions, including heat-treating building, forge shop, shipping building, etc., to cost about \$645,000. H. Lloyd, 4605 Montrose Blvd., Houston, is architect.
- HOUSTON, TEX.—A. I. Martin Welding Co., 1107 Austin St., has plans for an additional plant building to cost about \$40,000.
- PORT NECHES, TEX.—Jefferson Chemical Ca., care American Cyanamid Co., 30 Rockefeller Plaza, New York, has plans under way for a chemical plant on a 1091-acre site, to cost about \$10 million.
- TYLER, TEX.—Bryant Heater Co., 1020 London Ave., Cleveland, will let contract soon for a plant in Tyler for manufacture of gafired heaters and furnaces, to cost about \$200 000, total cost with equipment about \$770 000. Thomas. Jameson & Merrill. Coastruction Bldg., Dallas, Tex., are architects.

CALIFORNIA

- LOS ANGELES—American Can Co. has plass for additions to its plant at 4815 Santa Fe Ave., including two manufacturing buildings and a warehouse, to cost about \$1 million.
- VENICE, CALIF.—Davis Precision Machine Co., 1325 South LaBrea Ave., Los Angels, is having plans drawn for a factory and office building at 9730 Airport Ave., Venice, 100 z 200 feet, to cost about \$70,000. Plans are by Murray Erick, 811 West Seventh St., L Angeles.

OREGON

SPRINGFIELD, Oreg.—Casein Co. of America has let contract to O. C. Hart, Eugene, Oreg. for glue plant 80 x 100 feet, boiler house 25 x 30 feet and formaldehyde plant 25 x 32 feet, with 60-foot ceiling.

WASHINGTON

- LONGVIEW. Wash.—Port of Longview plans purchase of two locomotive cranes. 25 to 40 tons, and other handling equipment. Haney Hart is port manager.
- PATEROS, WASH .--- City plans construction of a sewage disposal plant on plans by Parler & Hill, Seattle, engineers.
- PULLMAN, WASH.—City plans \$180,000 diposal plant and water system improvemencesting \$50,000, including elevated tank, numps and fittings. Steven & Koon, Porland, Oreg., are engineers.
- SEATTLE—Ford Motor Co., W. C. Patterson, branch manager, will take bids about Nor. I for a parts and distribution plant, to cat about \$775,000.
- VANCOUVER, WASH.—Lucien Goron, former department head at the local shipyards, has plans by D. J. Stewart, architect, for a shet metal plant 50 x 100 feet at West Twelfth and Jefferson streets.

VAKEH USE D TORS HE SERVICE DRAKE STEEL SUPPLY CO SOUTH ALAMEDA 60 STREET LOS ANGELES 2, CALIF. LUCAS 6241

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• A long-time user writes us enthusiastically about savings resulting from "KOSMOS" Porcelain Plungers installed in his pumps. Claiming the "worst" pumping conditions, he further states: "now we have no trouble whatever with packing".

Highly abrasion and corrosion resistant, the porcelain becomes smoother the longer it is in operation. Only finger-tight adjustment of stuffing boxes is necessary to prevent leakage. The small coefficient of friction is continuously reflected in lower power requirements and savings from increased plunger and packing life, increased efficiency and reduction in time out for repair are realized on practically all services, whether for clear water, oil, gasoline, gritty materials or chemicals.

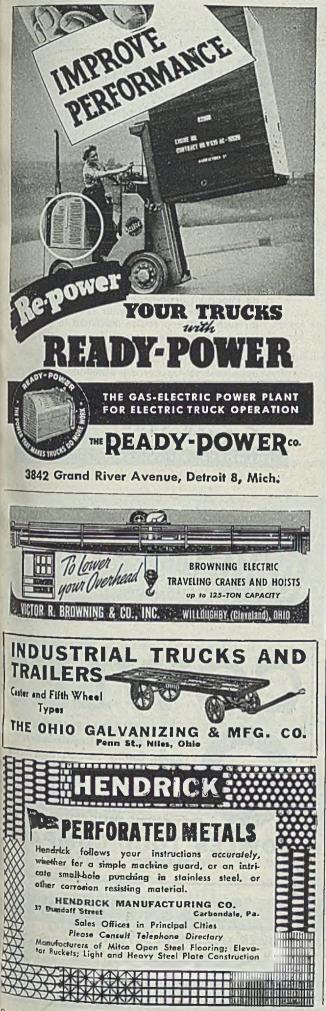
There is a "KOSMOS" Porcelain Plunger for practically every pump. Sizes range from 134'' to 16''in diameter and from 8'' to 48''' in length. They are suitable for pressures up to 2000 psi and withstand corrosive or abrasive action at temperatures up to 150° F.

• Investigate these money-savers. Write today for Data Sheet 57-2 which describes patented "KOSMOS" Porcelain Plungers in detail. The Aldrich Pump Company, 2 Gordon Street, Allentown, Pa.

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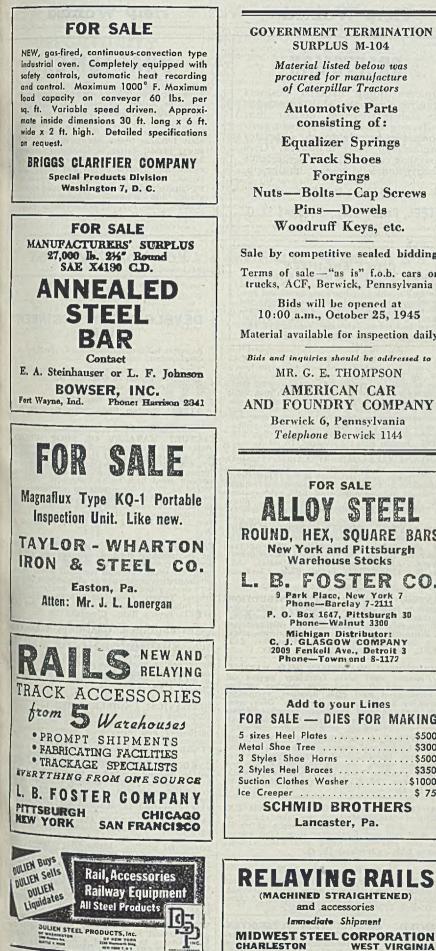
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EQUIPMENT...MATERIALS



GOVERNMENT TERMINATION SURPLUS M-104

Material listed below was procured for manufacture of Caterpillar Tractors

Automotive Parts consisting of:

Equalizer Springs **Track Shoes** Forgings Nuts-Bolts-Cap Screws Pins-Dowels Woodruff Keys, etc.

Sale by competitive sealed bidding

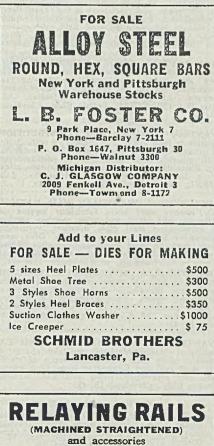
Terms of sale—"as is" f.o.b. cars or trucks, ACF, Berwick, Pennsylvania

Bids will be opened at 10:00 a.m., October 25, 1945

Material available for inspection daily

Bids and inquiries should be addressed to MR. G. E. THOMPSON

AMERICAN CAR AND FOUNDRY COMPANY Berwick 6, Pennsylvania Telephone Berwick 1144



Immediate Shipment

GOVERNMENT TERMINATION LOT M-102

Material listed below was procured for manufacture of Caterpillar Tractors

(APPROXIMATE AMOUNTS)

300,000 lbs. **Grey Iron Castings**

> 50,000 lbs. **Steel Castings**

26.000 lbs. Malleable Iron Castings

1,612,000 lbs. Forgings (SAE 1025 to 1050 Steel)

> 140.000 lbs. **Steel Shapes** consisting of angles

2,187,000 lbs. **Steel Bars** rounds and flats

Sale by competitive sealed bidding

Terms of sale—"as is" f.o.b. cars or trucks, ACF, Berwick, Pennsylvania

Bids will be opened at 10:00 a.m., October 23, 1945

Material available for inspection daily

Bids and inquiries should be addressed to

MR. G. E. THOMPSON

AMERICAN CAR AND FOUNDRY COMPANY Berwick 6, Pennsylvania Telephone Berwick 1144

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Mechanical Engineers, Designers and Draftsmen, experienced in material handling, crushing, power plants, hoisting, and problems peculiar to mining and smelting.

Structural Engineers, Designers and Draftsmen, experienced in both Structural Steel and Reinforced Concrote for Industrial Type Structures.

Write only, giving broad detailed information regarding age, marital status, education and experience. References required.

Work located in Salt Lake City, Utah. Personat Interviews can be arranged in Boston, New York, Chicago, San Francisco and Salt Lake City.

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GENERAL FOUNDRY SUPT. GOOD ORGANIzer, highly production and cost minded, active and aggressive, thoroughly experienced both dry and green sand. Will have full charge large foundry operation producing railway, locomotive, ship, blast furnace and general machine castings, etc., from heavy and maintained backlog of orders. This position now vacant. Salary is open and commensurate with your qualities and ability; future is secure, with unlimited opportunity. Give full details in your letter, please. Address Box 259, STEEL, Penton Bldg., Cleveland 13, O.

WANTED, GENERAL MANAGER BY MIDwestern company to take charge all divisions of the company. Must be proven executive with ability to get results, type of business general steel plate and alloy fabrication, construction, etc. Write stating experience, education, age, salary expected, companies worked for, positions held, etc. Address Box 250, STEEL, Penton Bldg., Cleveland 13, O.

OLD ESTABLISHED STEEL WAREHOUSE handling Sheet and Strip Steel has opening for representative in Indianapolis and vicinity. Experience essential. Excellent opportunity. Address Box 261, STEEL, Penton Bldg., Cleveland 13, O.

WANTED-EXPERIENCED ESTIMATOR-General Construction Work. Give references and salary requirement. Address Orval Wessner, P. O. Bor 2057, Milwaukee, Wis.

Help Wanted

DRAFTSMAN

Concern doing national business requires draftsman with experience on industrial ovens and/or dust collecting systems. Permanent position assured to right man, with sales engineering future if desired. Give complete educational and experience history and send recent photograph.

Address Box 254,

STEEL, Penton Bldg., Cleveland 13, O.

WANTED CHIEF ENGINEER

CHIEF ENGINEER Executive with ability to take full charge of all engineering, rasearch, and development. Must be familiar with oil refinery equipment and contivection, genaral steel plate construction, and general process equipment. Location midwest, Write giving full information, age, education, experiance, salary, references, etc. to Box 197, STEEL, Penton Bldg., Cleveland 13, O.

MACHINE SHOP SUPERINTENDENT — CApable and fully experienced on medium to heavy work, for highly modern shop (all new machine tools) operated in connection with large tonnageproducing steel foundry, handling both own work and contract jobs. Must be able to organize department for efficient production and to organize and supervise estimating. Position open now; salary open to man of the right caliber. Your application should cover all details. Address Box 260, STEEL, Fenton Bldg., Cleveland 13, O.

WANTED: SALESMAN BY LARGE TUBING manufacturer of both seamless and welded in carbon, alloy and stainless steels. Must have Mechanical or Metallurgical Engineering college degree, or suitable alloy steel field sales experience. Give full details with application. Write Box 265, STEEL, Penton Bldg., Cleveland 13, O.

IRON & STEEL EXPORT EXECUTIVE WHO controls sufficient business to warrant conducting own department on liberal profitsharing arrangement, wanted by established export-import concern. All correspondence confidential. Address Box 186, STEEL, Penton Bldg., Cleveland 18, O.

WANTED, MANAGER FOR CONSTRUCTION division to take full charge. Executive with ability to organize and get results. Must be experienced with oil refineries, chemical, steel construction, etc. Write stating age, education, experience, references and salary expected. Address Box 249, STEEL, Penton Bldg., Cleveland 13, O.

ENGINEERING DRAFTSMAN. OLD, NATIONally famous steel plate fabricator serving oil refineries and allied industries requires services of experienced steel plate detailers. Permanent job under large expansion program. Give complete personal and experience record. Address Box 172. STEEL, Penton Bldg., Cleveland 13, O

PROMOTION & ADVERTISING DIRECTOR wanted by national organization in building material field. Knowledge of steel products such as galvanized sheets, fencing, etc., desirable. Permanent position. good salary, interesting work. Address Box 238, STEEL, Penton Bldg., Cleveland 13, O.

WANTED, YOUNG, AGGRESSIVE AND EXperienced Master Mechanic to take charge of machine shop and plant maintenance of rerolling steel mill and fabricating shop. Give education and experience. Reply Box 236, STEEL, Penton Bldg., Cleveland 13, O.

POSITION AVAILABLE

for qualified individual experienced in supervision of Board Drop Hammer Shop, Hot Upsetting, Forging, Die Design, and Estimating. Address P. O. Box 1798, Columbus, Ohio.

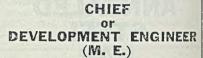
WANTED: CONSTRUCTION SUPERINTENdent-General Foreman-Carpenter Foreman, Give references and salary requirement, Address Orval Wessner, P. O. Box 2057, Milwaukee, Wis.

Help Wanted

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Large steel company in Pittsburgh area has several opportunities for draftsmen with high school or college education and experience in the following areas: design of steel mill and steel foundry products; railroad track accessories; layout and design of steel mills, blast turnaces, open hearth furnaces, and power plants; design of fabricated concrete bars; layout of electric power and control equipment; general mechanical design and layout. Please submit details, statement of experience and education, inexpensive photograph, and required minimum earnings. Addiress Box 142, STEEL, Penton Bldg., Cleveland 13, O.

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American & European experience. (Production, development, research.) Alert creative imagination, good cooperativeness. Knowledge of 4 foreign languages, estensive travelling experience.

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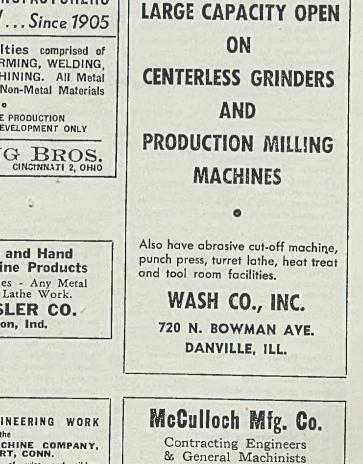
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