STEEL

The Magazine of Metalworking and Metalproducing

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TECHNICAL

FEATURES

MARKETS

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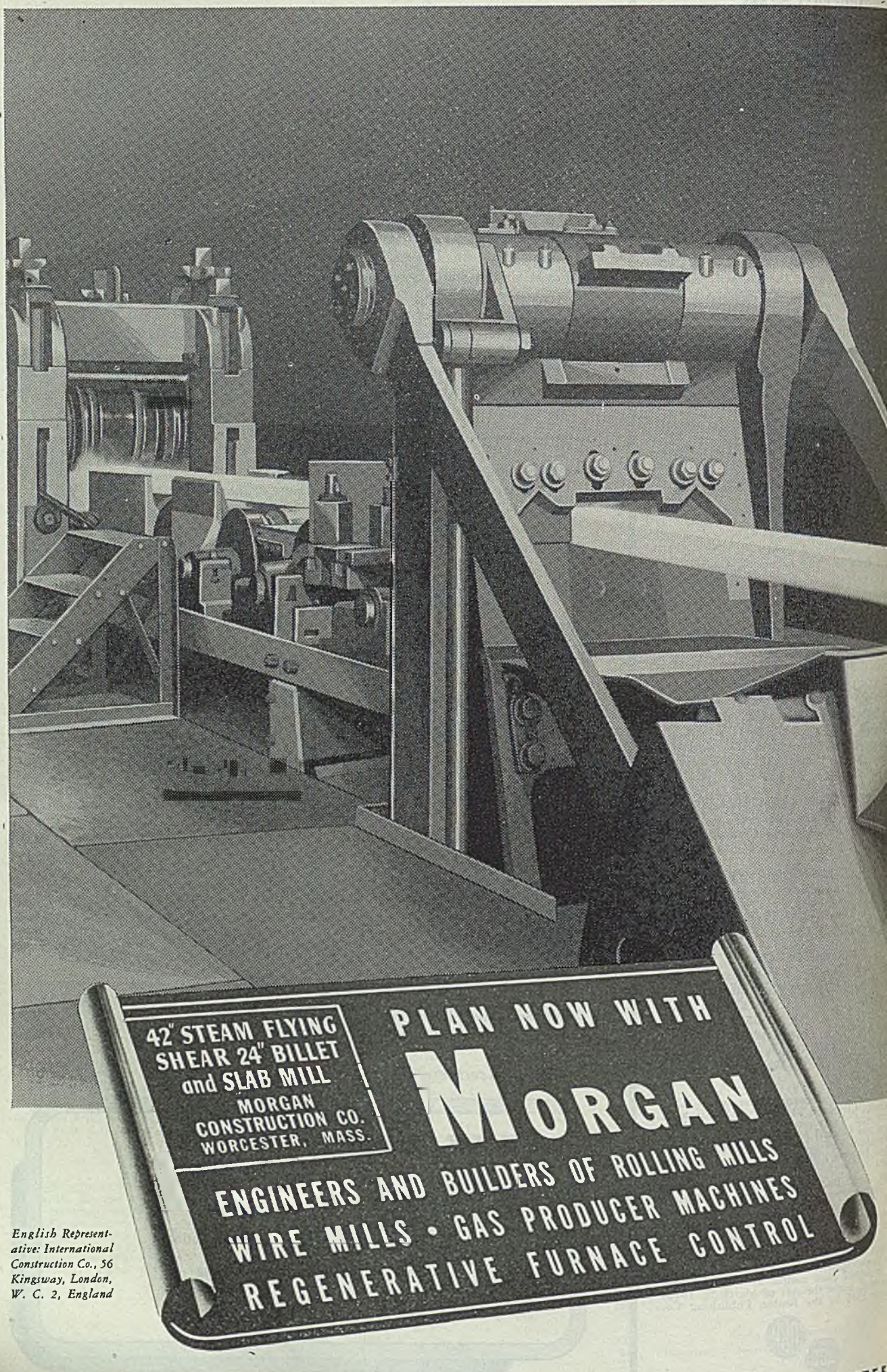
Transfer Crane System Aid in Manufacturing

Nitriding Engine Parts in Large-Scale Operation

Spark Gap Converters for Induction Heating

Steelmakers Test Electrolytic Manganese



English Representative: International Construction Co., 56 Kingsway, London, W. C. 2, England

STEEL
November 12, 1945

Statistical Red Flags

For many years the Annual Statistical Report of the American Iron & Steel Institute dealt only with figures pertaining to production and prices. Several years ago, some information on investment, income, number of employees and dividends was introduced into the book. In the 1944 report, just issued, one finds new tables on balance sheet and income data and more detailed figures on number of employees, hours worked and wages.

This tendency to augment important production and price data with an increasing amount of information on finance and employment is gratifying. It is in keeping with the mounting interest manifested by all types of people in the economics of business. It is to be hoped that the institute in future years will continue to expand its statistics on broad economic factors and that other industrial associations will round out their statistical services so as to present a clearer picture of the economic status of their respective industries.

An excellent example of how values can be derived from this expanded statistical service is afforded by the table on pages 6 and 7 of the institute's 1944 report. Among other data, this table shows the number of employees and stockholders of steel companies at the end of each year from 1935 to 1944, inclusive. In 1935, the industry reported 547,112 employees and 551,832 stockholders. Note well the fact that after the prolonged depression of the thirties, which certainly discouraged stock ownership, the number of stockholders exceeded the number of employees by 4720. At the end of 1944 employees numbered 869,493 and stockholders numbered 492,509. In short, in a decade the number of employees increased from 547,112 to 869,493—a gain of 59 per cent—whereas the number of stockholders declined from 551,832 to 492,509, a drop of 11 per cent.

It is true, of course, that the war provides an obvious explanation for the sharp rise in employment. It is true also that the trend in number of stockholders is not steady or consistent. The sharpest declines in number of stockholders occurred in 1936 and 1944.

Nevertheless, this narrowing of the base of ownership of steel companies can be construed as a red flag warning us of danger. It probably means that the overall effect of unsound government policies in respect to business is discouraging investors from risking their savings in private enterprise.

More statistical light on the basic economic factors affecting industry would help tremendously in the fight against crackpot government policies.

RETROACTIVE RACKET: One of the great injustices inflicted upon industry by the federal government is the assessment of penalties or damages retroactively after an administrator or a court has reversed a previous ruling or a decision.

Frequently an employer, having complied fully with the provisions of a law as currently interpreted by the authorized government officials, finds himself liable for large sums for past services of employees, some of whom may be no longer in his employ, but whose right to collect can be asserted as much as 12 years after the services were rendered—all because a government administration or court had reversed its opinion.

This outrageous practice of employing the retroactive factor to make a criminal out of a law-abiding employer can be attributed, first, to anti-business New Dealers who deliberately refrained from incorporating statutes of limitation in most of the laws introduced since 1933 and, secondly, to Congress for not noticing this clever and diabolical omission.

Fortunately, Congress is beginning to correct its

(OVER)

error. The powerful House Judiciary Committee has approved H.R. 2788 which would establish a statute of limitations against retroactive liabilities under numerous federal laws which do not contain specific statutes of limitation. In the interest of simple honesty in government, Congress should pass this bill promptly. —p. 98

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ELECTRONIC SPRAYING: Although the principles of electronics have been applied successfully to numerous industrial operations, manufacturers probably are just beginning to scratch the surface of the possibilities in this field.

A case in point is electrostatic spraying. In recent years the electrostatic spraying process commanded considerable attention because it made possible the production of high-quality, uniformly-coated articles with a minimum loss of coating materials.

Now experiments are being made on the electrostatic spraying of porcelain enamels. The process consists of charging the spray particles in an electric field and the attraction of these particles to the object to be coated. Theoretically it is not unlike electroplating, except that the spray particles are suspended in air whereas in electroplating the metallic particles are suspended in a water medium.

Tests indicate that this process of applying porcelain enamel may prove advantageous on flat or cylindrical ware with simple flanges or symmetrical shapes, particularly when highly repetitive operations are possible. —p. 118

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WHAT IS A BARGAIN? "During the term of this agreement, neither the union nor any employee, individually or collectively, shall cause or take part in any strike, or other interruption or any impeding of production at any plant of the company covered by this agreement.

"The terms and conditions of this agreement shall continue in effect until Oct. 15, 1946."

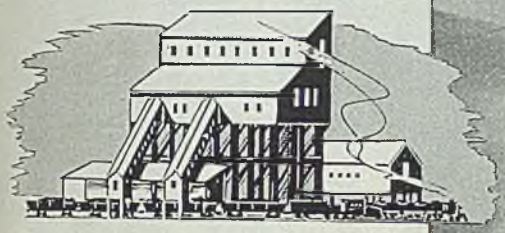
These paragraphs are from the contract signed by Republic Steel Corp. and the United Steelworkers of America dated April 11, 1945. USA (CIO) has requested the National Labor Relations Board to take a strike vote of Republic employees under the provisions of the War Labor Disputes Act.

General counsel of Republic writes NLRB that Congress never intended that the strike vote provisions of this act or the facilities of NLRB should be used for contract-breaking purposes. It is curious that the government talks about restoring true collective bargaining at the same time its agencies are actively helping unions to break true bargains. —p. 91

POSTWAR POSTSCRIPTS: As the War Production Board goes out of existence and the Civilian Production Administration takes over (p. 95) progress in reconversion is seriously hampered by strikes, labor shortages, lack of materials and component parts and confusion over price policy. Manufacturers of a wide variety of consumer goods report that their production is from 15 to 75 per cent below the level they had expected in the fourth quarter. . . . American Iron & Steel Institute's figures on shipments of steel products to principal consuming industries in 1944 (p. 103) shows that shipbuilding retained its lead as the No. 1 consumer. It took 17 per cent of the total, jobbers and warehousemen accounted for 13 per cent and the railroads consumed 9 per cent. . . . George Christopher, president of Packard, refers to the present as the "period of re confusion" (p. 105), which is an apt expression. . . Secretary of Commerce Wallace's report on how much of a wage increase industry can absorb without an increase in prices elicited violent rebuttals in Detroit (p. 106) by Messrs. Rising, Christopher and Romney. . . . Fruehauf Trailer Co. will start work immediately on a one-floor, 400 by 2250-foot truck trailer assembly plant at Avon Lake, O. (p. 116) 20 miles west of Cleveland. It will be the world's largest trailer plant and will employ 2500 persons. . . Bituminous coal output (p. 194) more than doubled in the first full week of work after the miners' strike . . . Jessop Steel Co. is using the sodium hydride descaling process (p. 123), finding it particularly advantageous in descaling stainless steels of all types . . . Last August United States Steel withdrew an offer to consider leasing or purchasing the Geneva steel plant on the ground that statements by government officials seemed "to rule out U. S. Steel as a prospective lessee or purchaser." Last week W. Stuart Symington, head of SPA, told a subcommittee of the Senate (p. 92) that "SPA feels that the best company to have purchase this plant would be the United States Steel Corp. . . . It may be the only company that can carry on this operation unless the government subsidizes it". . . . Richard T. Frankensteen, CIO candidate for mayor of Detroit lost out last Tuesday (p. 105) as did a number of CIO-PAC sponsored communists running for lesser offices in other industrial cities. This is gratifying. Unfortunately, however, they will be back next time.

E. L. Shaner

EDITOR-IN-CHIEF



This 23-yard Inland Hi-Steel bucket, at right, saved $23,000 the first year.

$23,000 Saved . . . with Inland Hi-Steel

Facts and Figures Prove Advantages of Using Inland Hi-Steel Where Light Weight and High Strength are Needed.

The records maintained at Maumee Collieries show that when Inland Hi-Steel replaced material formerly used these important advantages were gained:

(1) The first cost was 40% lower.

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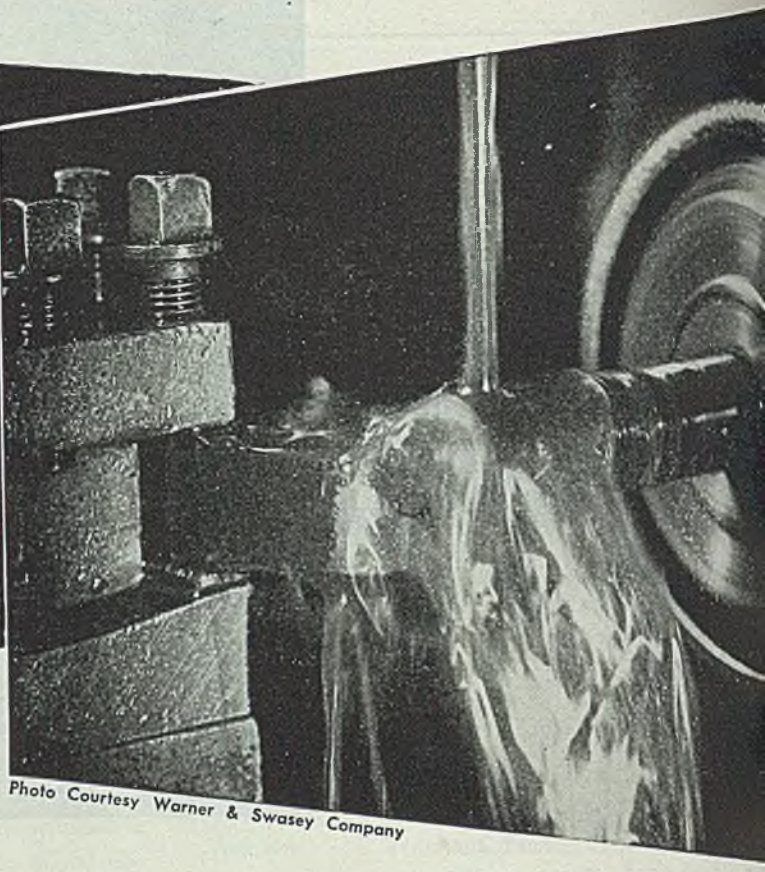
HIGHER SPEEDS AND FEEDS



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TEXACO CUTTING, SOLUBLE AN HYDRAULIC OILS FOR FAST MACHINI

TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON EVERY SUNDAY NIGH

Industry and labor must get together and end current industrial strife, as the administration wartime controls soon will be removed, President Truman tells the opening session of the National Labor-Management Conference. NEA photo

Labor-Management Conferees Seek Ways To Minimize Disputes

Industry and AFL delegates resist attempts by CIO representatives to inject current wage demand into agenda. President warns solution to industrial relations problems will be found "some place else" if conference fails

[TOP] representatives of industry and [the] unions last week waded through [the] preliminaries of the National Labor-[Man]agement Conference which is attempting to formulate a national policy [to] govern the conduct of industrial rela[tions].

Early sessions of the conference brought forth no definite program for [min]imizing industrial disputes. They did, however, reveal a determination on the [part] of the majority of delegates to hold [the] conference to the development of a [long]-range plan for bettering industrial [rela]tionships.

This determination was made apparent [as] the delegates in overriding attempts [of] the Congress of Industrial Organizations [rep]resentatives to inject the current [wage] issues into the deliberations. Management and American Federation of Labor delegates appeared united in an effort to hold the conference to the agenda and to exclude, as AFL President William Green put it, "controversial subjects, such as wages, full employment and legislation."

Impartial observers applauded this action as it was generally conceded that the conference could be wrecked quickly and completely if the delegates undertook consideration of current wage demands—a subject on which they could make no binding decisions, but one which would be almost certain to arouse ill feeling and destroy the purpose of the meeting.

In opening the conference, President Truman told the delegates their job was to find ways and means "of resolving their differences without stopping production."

The answers to this problem must be found, the President warned. "If the people do not find them here, they will find them some place else."

Three of the four members of the committee of principals, Ira Mosher, representing the National Association of Manufacturers; Eric Johnston, United States Chamber of Commerce; Mr. Green, AFL; and Philip Murray, Congress of Industrial Organizations, in opening speeches stressed the importance of striving for a long-range program for minimizing disputes. The fourth, Mr. Murray, asked that the conference consider wages.

The majority aim of the conference was fairly expressed by Mr. Johnston: "There is one fundamental result which must flow from this conference. This nation needs a code of conduct, a national charter, a set of principles, a national policy to govern the conduct of industrial relations. This code should rest on the foundation of four fundamental principles:

"First: Labor unions are now woven into our economic fabric and collective bargaining is an essential part of the democratic process. The nation and industry must accept this as a fact. I

mean accept it, not from the lips, but from the heart.

"Second: Management must retain the unabridged right to manage. Its right to initiate, the right to make decisions, must remain where it is now.

"Third: Both labor and management must recognize that ever higher standards of living come only from increased productivity. Anything which retards output or cuts into quality becomes by definition immoral, antisocial and untenable.

"Fourth: The consumer, the worker and the investor must all share equitably in the fruits of increased production. Their respective shares might be labeled lower prices, higher wages, sounder profits. There is no limit to the abundance of good living which can flow from the wholehearted acceptance of this principle."

Mr. Green and Mr. Mosher agreed that the conference should not be made a collective bargaining conference but should be restricted to the items listed on the agenda—all designed to minimize industrial friction.

Most of the early sessions was devoted to the preliminary statements of aims and principles and to organization.

Generally, organization proceeded smoothly and according to preliminary plans. Only notable exception was in the establishment of the important executive committee. The agenda called for a committee of eight members and a non-voting chairman, these to include four representatives of management and two each from the CIO and the AFL. To this, John L. Lewis, president of the United Mine Workers, raised strenuous objections and the committee was increased to 16 voting members, as follows: For management, Eric Johnston, Ira Mosher, M. W. Clement, John Holmes, H. W. Prentis Jr., William M. Rand, David Sarnoff and Herman W. Steinkraus; for labor, Philip Murray, R. J. Thomas and Lee Pressman, representing the CIO; William Green, Mathew Woll and George M. Harrison, representing the AFL; John L. Lewis, representing the mine workers; and T. C. Cashen, representing the railroad brotherhoods.

Six other committees named, and management's representatives, are: Collective bargaining, Carl Borg, E. J. Thomas, C. W. Gaylord, Almon E. Roth, Walter M. Ringer, John A. Stephens, W. J. Grede.

Management's right to manage: H. Prentis Jr., Charles R. Hook, E. J. R son Jr., Stanley B. Grove, C. O. Ski and C. E. Wilson.

Jurisdictional disputes: Harry W head, E. N. Allen, C. W. Doherty, W Winans.

Conciliation: William M. Rand, Dietrich, Leonard R. Hurtz, and Ruthenberg.

Initial collective agreements: Holmes, M. M. Anderson, Charle Eaton Jr., Lee Hill, T. O. Moore E. P. Palmer.

Existing agreements: H. W. S kraus, W. P. Ahearn, Powell C. Gr H. D. Hailey, George H. Love James Tenham.

Number of Workers Hit By Strikes Totals 275,000

Number of workers on strike o volved in work stoppages throug the country last week was estim at 275,000.

During the week work on recon ing the Willow Run plant near D to automobile production was res after a 6-day strike.

John L. Lewis, president of the United Mine Workers, accepts the challenge of independent unions picketing the National Labor-Management Conference and crosses the picket lines. Pickets were protesting the fact that independent unions were not represented at the sessions. NEA photo

STEEL

U.S. Steel Declines To Reopen Wage Parley Pending Price Adjustment

PROPOSAL of Secretary of Labor Schwellenbach that the United States Steel Corp. reopen wage negotiations with the United Steelworkers of America (CIO) under a special negotiator was declined last week by Benjamin F. Fairless, president of the corporation.

Mr. Fairless, in a letter to Secretary Schwellenbach stated that existing price ceilings do not enable the corporation to grant a wage increase at this time and that wage discussions would be useless until the question of prices was settled.

Resumption of collective bargaining between the corporation and the union was proposed by Secretary Schwellenbach earlier in the week at which time he named Arthur S. Meyer, chairman of the New York state mediation board to serve as special conciliator in the dispute. Initial bargaining negotiations on the union's demand for a $2 per day wage increase were terminated Oct. 23 when the corporation refused the union's demands. On Oct. 29 the union petitioned the National Labor Relations Board for a strike vote in the steel industry, other steelmakers having taken the same position as U. S. Steel on wages.

Corporation Restates Position

In his letter to Secretary Schwellenbach declining to reopen negotiations until the price question was settled, Mr. Fairless said:

"Our position with respect to this heavy wage demand is set forth in the letter from Mr. John A. Stephens, vice-president, Industrial Relations, United States Steel Corp. of Delaware, to Mr. Murray dated Oct. 23, 1945.

"President Truman's recent speech does not change the basic situation described in Mr. Stephens' letter to Mr. Murray.

"Existing OPA ceiling prices for steel products do not enable us to grant a wage increase at this time. In view of this determining factor, it seems futile to appear to engage in collective bargaining conferences on the union's demand for a general $2 a day wage increase until after OPA has acted on the long-pending application of the steel industry for substantial increases in present ceiling prices for steel products to compensate for past heavy increases in costs.

"Such present ceiling prices are little above the quoted prices for steel before the war. Labor and other costs in the steel industry, on the other hand, have gone up tremendously since 1940. As a consequence, a great majority of our steel products are today being sold at a loss. We believe carbon steel prices should immediately be increased on the average approximately $7 a ton by reason of these past increases in costs.

"If progress is desired in the direction of resolving the union's wage demand through sincere collective bargaining, as you suggest, the first step is through prompt and fair action by OPA in granting adequate increases in present ceiling prices for steel products so as to compensate for substantial past increases in our costs.

"In addition, we must have adequate insurance from OPA that such ceiling prices will also be increased so as simultaneously to compensate for any wage increase which may result from the union's present wage demand. We should not be expected by anyone to carry on our steel operations at a loss."

Republic Asks Dismissal of Union Petition For Strike Vote; Cites Contract Provision

DISMISSAL of the United Steelworkers' petition for a strike vote in the plants of Republic Steel Corp., Cleveland, was asked of the National Labor Relations Board last week by company counsel on the ground that Republic's contract with the union expressly prohibits any strike during the life of the pact. The contract was signed April 11, 1945, and continues in effect until Oct. 15, 1946.

In a letter to Paul M. Herzog, NLRB chairman, Thomas F. Patton, Republic vice president and general counsel, calls attention to section 10 of the contract:

"During the term of this agreement, neither the union nor any employee, individually or collectively, shall cause or take part in any strike, or other interruption or any impeding of production at any plant of the company covered by this agreement."

In return for the no-strike clause, Mr. Patton points out, and for the express purpose of making that clause effective, the union was granted maintenance of membership and the checkoff of dues.

"The obvious purpose of the union in requesting the strike vote is to lay a basis for calling a strike—action which it voluntarily renounced in its contract with Republic until Oct. 15, 1946. It is all too apparent that by seeking to enlist the facilities of the National Labor Relations Board to take the strike vote, the union is endeavoring to dupe the public by making it appear as though the federal government may be approving a strike which would be a deliberate violation of the union's contract."

General Motors, Rejecting 30 Per Cent Wage Boost Demand, Offers Cost-Of-Living Raise

COST-OF-LIVING wage increase offered by General Motors Corp. last week was rejected by the United Auto Workers' union (CIO).

In making its offer, General Motors formally declined to accede to the union's demand for a 30 per cent wage boost, terming the demand "excessive." In its stead, however, it offered increases in classifications where since 1941 wages have not been raised in proportion to the rise in the cost of living.

This raise, said a spokesman for General Motors, would amount to an average of 8 to 10 per cent for the corporation's 180,000 hourly-rated employees, and in computing the amount to which each worker is entitled the corporation is willing to accept the government's findings that living costs have increased 30 per cent since Jan. 1, 1941.

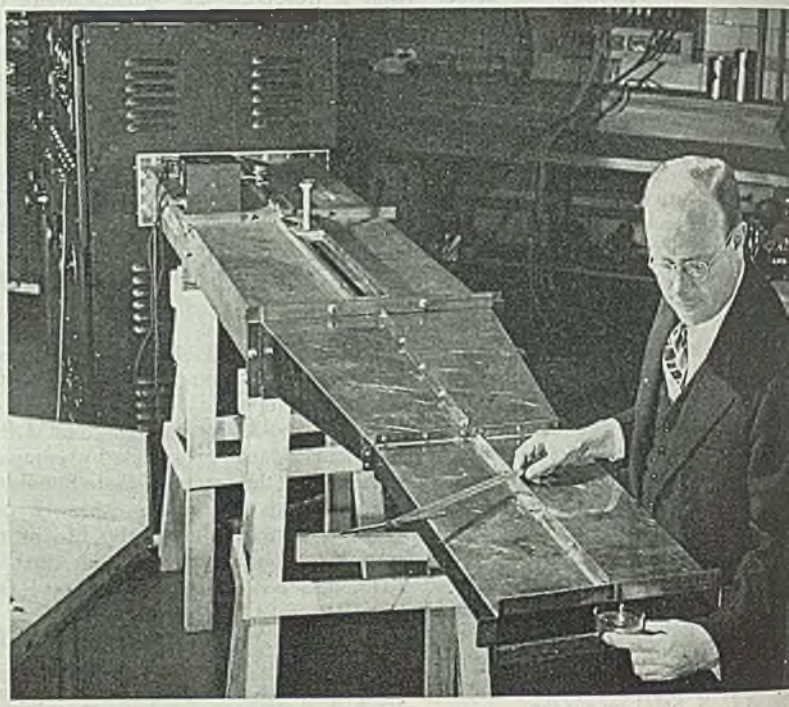
C. E. Wilson, president of the corporation, in its brief, rejected the theory of ability to pay as a valid argument for higher wages, maintaining that to demand General Motors pay its employees more than other companies pay is just as unreasonable as it would be to demand that the firm pay higher freight rates.

"General Motors Corp.," said Mr. Wilson, "is not willing to pay out in excess wages for work not performed money saved up for many years to modernize and expand its plants and provide more jobs. The money cannot be spent twice. The union is really proposing that the taxpayers of the country be called upon to subsidize either unjustifiably high wages or uneconomically low prices on General Motors products."

Rejection of General Motors' offer by the union indicated that it intended to press its demands to the limit. Further indicating that the union will seek to squeeze the corporation as far as possible, Walter P. Reuther, vice president of the auto workers' union, in a telegram to President Truman asked that the fixing of ceiling prices on 1946 automobiles be withheld pending a review by the Office of War Mobilization and Reconversion.

Favor U. S. Steel To Operate Geneva

Surplus Property Administrator Symington tells Senate committee he believes Corporation only one that can handle plant without government subsidy



ELECTRONIC "BLOW TORCH": Experimental model of dielectric heating unit which hurls high-frequency radio waves at an object to be polymerized, cured or bonded is demonstrated by Dr. J. A. Hutcheson, associate director of Westinghouse research laboratories. The unit, still in the laboratory stage, permits the projection of heat on an object wherever it may be, as opposed to present methods in which objects must be placed between metal plates or electrodes

OPERATION of the Geneva Steel Co. plant, largest of the war-born and government-owned units in the steel industry, by the United States Steel Corp. is favored by the Surplus Property Administration, W. Stuart Symington, head of the agency, last week told a subcommittee of the Senate Military Affairs Committee holding hearings on the disposition of surplus steel plants.

This represents an about face on the part of government spokesmen who earlier in the year were advocating "independent" operation of the western mill. U. S. Steel, in fact, last August withdrew an earlier offer to consider lease or purchase of the plant partially on the ground that statements by former Attorney General Biddle and members of the Surplus Property Board appeared "in practical effect to rule out United States Steel Corp. as a prospective lessee or purchaser of the Geneva plant."

Since that time, there has been a great lack of interest on the part of steel companies to acquire the Geneva plant and the only firm offer received has been one from Colorado Fuel & Iron Corp. to lease the plant, provided the government would install facilities for the production of peacetime products.

In opening the hearings before the committee, Chairman Joseph C. O'Mahoney stated that continued high operation of steel facilities would be necessary to the country's postwar economy and to assure that the government would be enabled to service its huge debt. Senator O'Mahoney warned those attending the hearings that a return to 60 per cent operations would mean "to fall back on a situation which will not permit free enterprise to work."

The government's first witness, Mr. Symington, had only proceeded far enough in describing the difficulties facing his agency in disposal of the plants, to mention that an offer of the Colorado Fuel & Iron Corp. for the Geneva plant at Provo, Utah, had been rejected, when E. Perry Holder, president of the Colorado company rose to point out that his company's offer was predicated on the belief that a 5-year lease, as provided by present law, is too short, and that 15 years might be a better term.

Mr. Symington rejoined that the government had refused the company's offer, one of the only three so far reported as showing any interest in the project, on the ground that it was too low.

"But the fact is," Mr. Holder put in, "it's the only offer you've got."

Mr. Symington objected to this statement, adding that even if it were the case, "we still would rather hold on to the plant until we get an offer that we consider fair to the government."

He revealed at this point that an arrangement has been concluded for temporary continuation of the Geneva plant in operation, after it was scheduled to close Nov. 10.

United States Steel Corp. has operated the Geneva plant, without charge or fee, and the existing agreement with this company was to have terminated Nov. 12. Mr. Symington reported at the hearing that a new agreement will be completed to run for 8 months, but which can be canceled at any time if a new operator is secured.

Chairman O'Mahoney also put into the record a letter from Rear Adm. Emory S. Land, chairman of the Maritime Commission, recommending that the plant be operated to manufacture plate that will be required for the postwar naval and shipbuilding prog

Mr. Symington referred to a fin of the Bureau of Mines, and to attorney general's report on the pl that it will be necessary to equip Geneva plant for production to m postwar market needs. Also, he repor a readjustment of freight rates w be necessary, particularly if Geneva to be enabled to supply tin plate West Coast can manufacturers at p that would prove unattractive to in Eastern producers.

Some of these considerations w in Mr. Holder's mind, he indicated advocating a change in the leasing te since, as he remarked afterward, 5-year provision would barely al time for the essential changes to made, and was inadequate for a b of profitable operation. In fact, raised a question on hearing that Geneva plant would be continued operation, as to whether it was to "a deficit operation."

The hearing developed conclusiv that private companies were reluctant undertake operation of any of the s plus government steel plants in th

present state, lacking some strong support from the government.

Henry C. Kaiser, operator of the Fontana plant, expressed doubt any company would want to buy Geneva as it now stands. And he went somewhat further than some earlier witnesses, in an exposition of the financing problem involved, and the attitude of the private operator on this score.

Mr. Kaiser made a strong plea before the committee for a decentralization of the steel industry that would provide a western industry in this field.

"There is serious doubt as to whether any private corporation or operator can afford to purchase the Geneva plant as it now stands," he said. "It may also be wise," he added later, "for the government to equip Geneva with certain peacetime facilities upon which there may be general agreement."

Senator Murdock, West Virginia, suggested that it might be wise for the government to add an amount to permit an outright sale that would lead to salvage of the Geneva plant for postwar use.

Senator O'Mahoney after overnight consideration of Mr. Holder's objections to the 5-year lease said that if the 5-year limitation now in the law is found to be too short to permit lease or disposal of the plants, the committee should ask for legislation to correct the situation. A witness for the RFC had just expressed an opinion that Mr. Holder "had courage to submit a proposal under the conditions."

Will Discuss Purchase

Most of the hearing revolved about the merits or demerits of the Colorado Fuel & Iron Corp.'s offer to lease the Geneva plant. Mr. Holder, under questioning, emphasized that his company's offer was solely to lease the plant, and did not involve a sale, although, he revealed later, he had indicated the company's "interest" in a possible sale, and was to discuss this possibility later this month with RFC officials.

Mr. Holder frankly told the committee that the only way in which his company could entertain the deal was for the government to make the necessary investment to convert the Geneva plant for peacetime production. He and Sam Husbands, director of RFC, agreed that under the 5-year limitation on leases, "neither the company nor the government can justify any investment," as Mr. Holder said.

As originally proposed, according to Mr. Husbands, the Colorado Fuel & Iron lease offer would have involved an investment by the government of $71 million for peacetime facilities. Some of these would include $5,850,000 for revamping the plate mill to strip mill production, $24 million for a sheet and tin plate plant; $10,900,000 for a seamless tube mill, and $750,000 for miscellaneous additions.

This total would have been added to the government's original cost of $190 million, against which, Mr. Husbands argued, the lease terms would have given the government only a return of $788,000 if the plant operated at 100 per cent.

Mr. Holder pointed out that this originally projected government investment was later scaled down to $41 million. He said the company's terms actually, on this investment, would have returned $798,000 to the government at 100 per cent capacity, and the government's outlay would only have covered the first four items of reconversion. His own figures, he said, indicated that the government and Geneva would split $9 million return.

RFC officials declared that "under no conditions would they put in the installations" contemplated in the Colorado Fuel & Iron lease offer.

By inference, testimony of other steel industry men followed this line. Thomas E. Millsop, vice president, National Steel Corp., said his own company has projected an expansion program to cost $40 million, and he forecast that the costs would be as high, and perhaps higher, than the costs of similar work in the war.

This witness said also that he did not agree with the idea that disposing of the facilities built with taxpayers' money at a sacrifice would increase consumption. He suggested it might be advisable for the government to have these steel plants "appraised at a proper value, and the government put that value on them, then hold them until the government can get what the plants are worth. Meanwhile, let private industry go ahead and expand." He said his company had made no offer.

A similar disclaimer was made by Roger Blough, general counsel, United States Steel Corp.

Mr. Holder joined with Henry Kaiser in the opinion that conditions exist in the West for successful utilization of Geneva, such as the presence of large ore bodies and the technical know-how.

W. Stuart Symington said his agency favored operation of Geneva by the U. S. Steel Corp. Explaining his position, in answer to questions, he said:

"The steel industry is an industry where an awful lot of money has to be put in, and the Surplus Property Administration feels that the best company to have purchase this plant would be the U. S. Steel Corp., because it has run it and it is tied up tight with its other mills on the West Coast.

"After looking at it," he continued, "we believe that it may be the only company in the steel industry that can carry on this operation unless the government subsidizes it."

Present, Past and Pending

■ ALLEGHENY LUDLUM TO CO-OPERATE ON STRIKE VOTE

PITTSBURGH—Allegheny Ludlum Steel Corp. last week notified NLRB it would co-operate fully on the strike vote scheduled at its plants Nov. 27 but pointed out by this strike poll both the NLRB and the company would be parties to a violation of the collective bargaining agreement between the company and the union if a strike results.

■ FONTANA GETS FRENCH ORDER FOR PLATES AND BARS

WASHINGTON—Henry J. Kaiser is furnishing the French Supply Mission with 100,000 tons of plates and 50,000 tons of bars from the Fontana, Calif., plant, according to reliable reports here.

■ AUTOMOBILE OUTPUT DROPS 74% BELOW SCHEDULE

WASHINGTON—Only 19,136 passenger cars, or about 26 per cent of expected output, were produced between July 1 and Oct. 1, Civilian Production Administration reported last week.

■ BIRMINGHAM STEEL FIRM BUYS MINNESOTA IRON ORE

BIRMINGHAM—Tennessee Coal, Iron & Railroad Co. has in transit 200,000 tons of Minnesota iron ore to keep the company's blast furnaces in production. This is the first shipment by the company from out of Alabama.

■ WILL LIFT CONTROLS NOV. 15 ON COKE INVENTORIES

WASHINGTON—All controls will be eliminated Nov. 15 on gas production and coke inventories because of an expected early return to normal by-product coal production, Civilian Production Administration announced last week.

■ WESTINGHOUSE ENTERS HOME ELECTRIC-HEATING FIELD

PITTSBURGH—Westinghouse Electric Corp. is entering the field of electric heating for homes, an entirely new activity for the company nationally. Manufacturing headquarters will be at Emeryville, Calif.

■ CLEVELAND EMPLOYMENT REACHES NEW PEACETIME HIGH

CLEVELAND—Industry here has started on an upward swing in peacetime activity with the employment index rising 1.2 points within the last 30 days to exceed the 1929 peacetime high by 9.2 points, according to the Chamber of Commerce.

Weaknesses in Surplus Property Administration Aired by Bradley

Retiring director of Office of Surplus Property in Department of Commerce believes disposition of consumer goods can be handled more satisfactorily by Reconstruction Finance Corp., which now is assuming duties of OSP

RESIGNATION of William S. Bradley from the post of director of the Office of Surplus Property in the Department of Commerce is of more than usual interest. Ever since disposal of surplus property was set up under the Surplus Property Act there has been a continuing exodus of men appointed to key positions in the program. Some of them have given brief explanations of their actions. When William S. Clayton resigned as surplus property administrator he declared that the Surplus Property Act was unworkable. When former Senator Guy Gillette resigned the same position he told a committee of senators that he also had had trouble in trying to comply with the law.

But Mr. Bradley is the first man leaving an important post in the disposal program to tell his story in full. His troubles, as he recounted them before a gathering of the National Conference of Business Paper Editors in Washington Nov. 2, were not the result of difficulties in attempting to comply with the provisions of the Surplus Property Act. Rather, they were due to unworkable priority and pricing policies set by the Surplus Property Administration.

Questioned by the editors after his set talk, Mr. Bradley said the job of disposing of surplus consumer goods, now in process of being shifted from the Department of Commerce to the Reconstruction Finance Corp. should be performed more satisfactorily by the RFC. Being a corporation, the RFC, he said, can make most of its decisions without outside reference, it can act swiftly as, for example, in adding enough personnel to handle disposition of consumer goods.

LARGEST CANNON: This 36-inch mortar, said to be the world's largest cannon, is capable of hurling a 2-ton projectile 8 miles. Developed and built by Mesta Machine Co., Pittsburgh, it was ready to be used against the Japs when the war ended. The barrel of the mortar is 38 feet long and weighs 100 tons. NEA photo

The Department of Commerce, explained, is dependent upon Congr for its appropriations, and the requ which it makes on the Hill may or m not be granted, and then only after mu crippling delay. Further, a departm such as Commerce is subject to a lot red tape which does not handicap corporation.

With the advent of V-J Day, Bradley said, his Office of Surplus Pr erty had anticipated the operational administrative problems of the disp job that lay ahead and had develo in co-operation with the old Sur Property Board, a workable program

Veterans' Provisions Unworkable

"To effectuate this program," Mr. Bradley, "the Surplus Property B had, at our request, revised regulatio implementing the priority provision the act, issued special orders under gulation 1, issued several exemptions exceptions to various existing regula and orders and had otherwise fully operated in the use of its authority influence in working out problems and between the owning agencies, OPA and other interested governm agencies and the Office of Surplus P erty of the Department of Comm

"When Congress abolished the b and created the Surplus Property A stration it very quickly became ev that the previously existing relatio would no longer continue. This was clearly brought into focus in the ferences of opinion which develope the revision of regulation 7, the re tion which provided certain prefer for veterans. The old regulation been found to be unworkable, du good part to the impracticability o old regulation 2, through which it h be implemented.

"But after the board had revise gulation 2 and removed the bottl of the 'freeze period' originally prov the new Surplus Property Admin tion, within 10 days of its inception without carefully thinking through problems involved, issued the re veterans' regulation over the pr protest of the Department of Comm This protest arose from certain abso unworkable provisions of the re regulation.

"Many of the provisions of revise gulation 7 will, in time, prove t only a further delusion for the vet of which we have already had fa much."

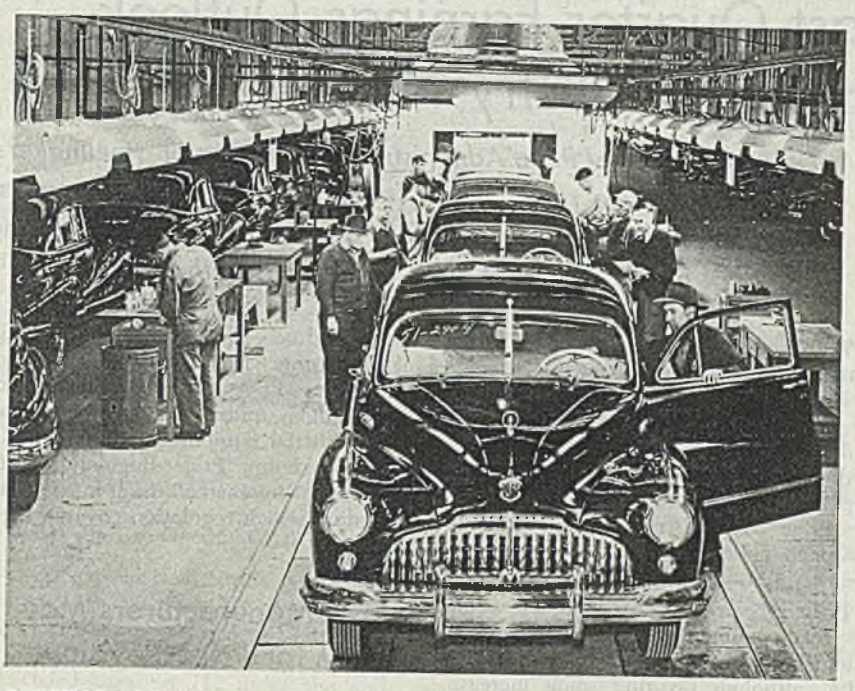
Unfortunately, continued Mr. Bra the divergence of views extends fa yond the matter of provision for vete he has found himself in disagree with the new Surplus Property Adm tration on "far-reaching changes w it has insisted upon making in our pr and sales policy.

"It should be pointed out that t the Surplus Property Administra

(*Please turn to Page 218*)

Shortages Retarding Production

Lack of adequate component and labor supplies restricts output. Steel deliveries to be less than scheduled



ROLLING AGAIN: New Buicks are coming from the assembly lines at Flint, Mich., and production is increasing daily with 10,000 cars scheduled for November. Prewar rate of production is expected to be reached by next March when output is scheduled to total 39,000 units

MANPOWER difficulties have retarded seriously the nation's reconversion plans. Manufacturers of a wide variety of consumer goods report that their production is anywhere from 15 to 75 per cent below the level they had expected to attain in the fourth quarter. A few companies have postponed their entrance into civilian goods production until the overall situation improves.

In addition to the difficulty in obtaining workers in their own plants, due mainly to the wage rates offered, reconverting manufacturers are also adversely affected by strikes which have reduced local supplies and the flow of components to their plants.

The task of guiding the industrial change-over to full civilian production has been assumed by the Civilian Production Administration, successor of the War Production Board. J. D. Small, CPA administrator, said last week that his agency will use its power to expand the production of materials and items still in short supply; to limit the use of scarce materials and to restrict the accumulation of inventories so as to avoid speculation and hoarding. The new agency will also grant priority assistance to break bottlenecks, facilitate the fulfillment of relief and other essential export programs and allocate materials necessary in the production of low-priced items.

CPA has assumed its duties at a difficult time, following a coal strike which was chiefly responsible for a drop in steel production of 700,000 to 950,000 tons below previous estimates. This loss will require all manufacturers to reduce their immediate consumption of steel to secure an even distribution of the metal. Steel production for last month was about 5,800,000 tons, according to one of the last reports issued by WPB.

Reduced operations will continue to upset planned shipping schedules and will delay deliveries of urgently needed steel products which manufacturing companies had on order. Accordingly, all manufacturers must face the fact that their steel receipts over the next 30 to 60 days will be below previous mill promises.

Steel producers have reported that they dipped heavily into their stocks of cold iron and increased their charges of scrap into the open-hearth furnaces in an effort to offset the reduced flow of hot iron caused by the banking of blast furnaces.

Although coal is moving more freely since the termination of the strike, it will require some time before coal reserves can be accumulated.

Reconversion demands have been increasing rapidly. Manufacturers of basic products have entered the market for heavy tonnages of steel to be delivered promptly. This demand is exceptionally heavy because it represents the need for repipelining as well as for current operations.

Under CPA, the former Iron and Steel Division of WPB is now known as the Iron and Steel Branch, Metals and Minerals Division. F. H. Hayes heads the division and P. J. Tracey heads the branch.

Specifications for deliveries of iron products, steel forgings, other steel items and steel alloying products are established in order M-21 which will remain in effect under CPA jurisdiction. That order also explains identification of purchase orders.

CPA inherits 51 other orders and three main priorities regulations from WPB.

Revocation of the tin order, M-43, hinges upon the availability of the ore from the Malayan peninsula and the Netherlands East Indies. Lead and antimony are two other metals still available only in limited quantities, and their respective orders, M-38 and M-112, will remain on the books temporarily.

Roughly, the controls still in effect are concerned with the distribution of scarce materials and products, their use in production and the amounts of these materials and products any one concern can hold in inventory. The overall plan is to assure, as far as possible, that these materials receive equitable distribution. The use of WPB forms for reporting will be continued.

Orders and regulations still on the books include, in part, the following: L-352, exports of automobiles and trucks; M-300, chemicals and allied products; M-384, lead chemicals; L-103, glass containers and closures; L-103-b, new glass containers and tin plate closures; M-81, cans; M-115, collapsible tubes; L-269, mining equipment; M-89, corundum ore; M-285, uranium; M-293, general scheduling order; R-1, rubber; M-63, imports of strategic materials; M-316 and M-318, coal; M-325, tinned and detinned scrap.

Mr. Small stressed recently the value of consulting with industry groups on problems of reconversion and announced that 176 key industry advisory committees will be retained. He said that these committees will be consulted before any action is taken which will materially affect production or distribution in their representative industries. Those retained under the Steel Division are: Gray Iron Foundry, Iron and Steel, Malleable Iron, Metallurgical and Operations, Steel Products.

Last Quarter Earnings Outlook In Steel Industry Not Bright

Delay of Office of Price Administration in acting on steelmakers' request for price relief makes fourth quarter of 1945 appear even less promising than previous quarter. Adjustable pricing for ingot molds and ingot mold accessories authorized

WITH steel producers' third quarter earnings reflecting a sharp shrinkage in income as a result of the termination of war demand, high production costs and frozen price ceilings, the earnings outlook for the industry in fourth quarter appears even less promising as the Office of Price Administration continues to postpone action on the steelmakers' recent request for price relief.

It had been hoped that relief would be forthcoming by this time, but as things now stand it is not certain the OPA, although favoring some increase, will authorize such until after the present question of wages has been definitely settled.

This is discouraging to producers since the request for an increase, up to $7 per ton, was based on increased wage and other costs which had accumulated prior to the present demands of the union for a $2 per day boost in pay. As a matter of fact, one large steelmaker states that if the new demands of the union are to be met an increase of around $14 per ton will be necessary.

Few upward price adjustments have been authorized on iron and steel products since the beginning of the war. Last spring a slight upward revision was permitted on certain steel products and in recent weeks an increase of 75 cents per ton was permitted on pig iron.

Adjustable Pricing Announced

Last week OPA announced adjustable pricing for ingot molds and ingot mold accessories. The action permits manufacturers to deliver these items at the present maximum prices with the understanding that any price increase authorized by OPA may be applied to deliveries made on and after Nov. 6, 1945, the effective date of today's action.

This industry breaks down its charges for ingot molds into the cost of pig iron and the cost of converting the molten iron into molds and accessories, as specified by the customer. These customers, generally, are the same customers from whom the molders bought the iron of which the molds are made.

Charges for converting iron into molds have not changed since 1937. Since the price of pig iron has been increased about $1.75 per ton, this industry is buying iron at the increased price and selling it back to the same class of customer at the 1937 rate.

Last week's action also removed ingot molds and accessories from the coverage of the gray iron castings regulation (Maximum Price Regulation 244) and placed them under the machines, parts and industrial equipment regulation (Revised Maximum Price Regulation 136). This will overcome confusion in the trade regarding which regulation covered these items.

Stove Manufacturers May Apply for Price Revisions

Manufacturers of household cooking and heating stoves, other than electric, and/or thermostats for use on such stoves may apply for price adjustments under the reconversion pricing orders of July 23 without showing that their production was curtailed by half or more from 1941 to 1945, the Office of Price Administration ruled last week.

Refractory Price Revision Provision Amended by OPA

Manufacturers of refractories now may apply to the Office of Price Administration for price adjustment when their overall operations have been conducted at a loss, regardless of whether their production is essential or low-priced.

Clayton Pricing Formula Extended on Surplus Tools

An extension of the Clayton formula for pricing government-owned standard general purpose machine tools and machinery was issued last week by the Surplus Property Administration, in the form of SPA Regulation No. 13.

Effect of the new regulation is to provide a fixed price policy for all surplus machinery and machine tools. The Clayton formula provided a depreciation pricing rate for tools with up to 36 months of active use. The new extension provides a price reduction rate for tools with up to 25 years of active use.

The percentage of original cost to be applied as selling prices range all the way from 85 per cent to 90 per cent for machines used less than one month to 15 per cent to 20 per cent for those which have been in active use 25 years. Machines used more than 25 years will be sold at current market prices, but not in excess of the 25-year price determined in accordance with the formula.

The regulation covers all metalworking machinery and represents a long range fixed price policy. It sets price tags on virtually all government-owned metalworking equipment. A machine tool inventory recently furnished to SPA by the owning agencies showed there was a potential surplus of approximately 700,000 items, of which approximately 340,000 items consist of "cut chip" machine tools.

Price Ceilings Raised 14 Per Cent on Metal Toys

Metal toy manufacturers have been permitted to increase their previous ceiling prices by 14 per cent. Office of Price Administration has established, effective as of Nov. 2, a 14 per cent industry-wide price increase factor for all reconverted manufacturers of such items.

Producers' Council Sets High Construction Goal

Supply of steel will be sufficient to meet next year's requirements for new construction at about $7.4 billion, an increase of 60 per cent over the 1945 total.

This was the consensus of manufacturers of building materials and equipment attending the semi-annual meeting of the Producers' Council Inc., in Cleveland last week. The Council's Market Analysis Committee forecast a record-breaking volume of building during 1946 and 1951 when expenditures for new construction should average $15 billion a year, or more than double the average for the 20-year period preceding the war.

Chairman of the meeting, and president of the Council, was L. C. Boyle of the Johns-Manville Sales Corp., who urged industry members in every major community to co-ordinate their efforts more effectively to insure a maximum volume of building in the future.

Other principal speakers included Charles E. Young, economist, and Irving W. Clark, manager, Better Homes Department, Westinghouse Electric Corp.; S. W. Corbin, manager, Industrial Heating Sale Division, Apparatus Department, and S. Wells Corbin, General Electric Co.; Joseph E. Merrion, president, National Association of Home Builders; John L. Haynes, chief, and William A. Shaw, chief statistician, Construction Division, Department of Commerce; George W. West, chairman, Construction and Civil Development Department, Department of Commerce; Tyler S. Rogers, Owens-Corning Fiberglas Corp.; Wilson Wright, Armstrong Cork Co.; North Wright, Libbey-Owens-Ford Glass Co.; Douglas Whitlock, Structural Clay Products Institute; Chris L. Christensen, Celotex Corp.; R. G. Creviston, Crane Co.; J. C. Bebb, Otis Elevator Co.

Progress Being Made Settling War Contracts

September completions more than double August total. Contracts pending settlement on Sept. 30 totaled 103,000

RAPID progress is being made toward settling the bulk of canceled prime war contracts by Dec. 31, 1945, according to the fifth quarterly report of Robert H. Hinckley, director of Contract Settlement. During September 2900 prime contracts were settled with cost to the government and 16,700 without cost. The total settled in September was more than twice the number settled in August, the previous record month.

This performance should now be bettered materially, because the victory over Japan caused an interruption of contract settlement in August and early September as to place emphasis on the more pressing problem of effecting terminations and of reconverting to civilian production.

From the beginning of war production to date, terminated contracts have numbered 288,000 involving $62 billion. Of these, 185,000 involving over $25 billion in canceled commitments have been settled. Surrender of Japan brought termination of 113,000 prime contracts involving $24 billion. On Sept. 30 the total number of prime contracts pending settlement was 103,000 involving commitments of $37 billion. Settlements averaged almost $1 billion per month during the third quarter; if contractors file their claims promptly, this rate of settlement could be increased to $4 billion or more monthly before Jan. 1, Mr. Hinckley points out.

Plants Cleared Quickly

Quick plant clearance has been possible even with mass termination, Mr. Hinckley reports. "In almost all cases," the report states, "termination inventories and government-owned plant equipment are being removed from plants within the 60 days prescribed by the Contract Settlement Act."

Only a small portion of industry's total assets is tied up in canceled contracts, Mr. Hinckley reports.

"It is estimated that the gross amount owed by government under canceled contracts is less than $3.5 billion. The amount of industry's funds actually tied up is considerably less than this, however. Partial payments and T-loans outstanding totaled $320 million. In addition, a large proportion of the $1.9 billion outstanding in other government-guaranteed loans and in advance payments is now being used to finance terminations rather than war production," he declares.

On Sept. 30, the report states, the War Department had the equivalent of 22,000 persons engaged fulltime on contract settlement work. The Navy Department had 4800 persons engaged fulltime and 1900 parttime. The Maritime Commission, Reconstruction Finance Corp., and Treasury Department had a total of 242 assigned fulltime and about 2000 persons available for parttime work.

Many contractors have expressed satisfaction with the way the job of contract settlement has been handled. Few complaints have been received. Only 21 appeals have been filed by contractors with the Appeal Board of the Office of Contract Settlement.

Chicago District Contract Terminations Speeded Up

Chicago Ordnance District made final settlement on 190 contract termination cases during the period Oct. 15 to Oct. 31. This reduces the district's backlog of unsettled cases to 712 as of the end of last month, according to Col. John Slezak, district chief.

Col. Slezak states that companies have speeded up greatly in submitting inventories and claims to the district during the recent period, and that the district now lacks only 187 inventories from contractors, compared with 373 on Oct. 15, while the number of claims yet to be received has been reduced to 282 from 488.

However, he declares that if the district is to achieve its goal of 97 per cent final settlements by the end of the year, it is imperative that the remaining inventories and claims be submitted in the immediate future.

Col. Slezak says that his organization has settled 518 termination cases since Sept. 1. Of the 712 cases still remaining to be settled, 51 are over four months old.

Machine Tool Dealers Meet In Cleveland Nov. 19-20

American Machine Tool Distributors Association will hold its annual meeting at Hotel Statler, Cleveland, Monday and Tuesday, Nov. 19 and 20.

Among the speakers will be A. G. Bryant, past-president of the association, who recently was elected second vice president of the National Machine Tool Builders' Association. Mr. Bryant, who is president of Bryant Machinery & Engineering Co., Chicago, has spent much time in Washington in the interests both of the builders and the dealers. His subject will be, "Business Retreats from Washington."

Guest speaker on the second day of the meeting will be Tell Berna, general manager, National Machine Tool Builders' Association. His subject will be, "The Machine Tool Industry from the Manufacturer's Viewpoint."

The annual dinner will be held Monday evening, with A. B. Einig, general manager, Motch & Merryweather Machinery Co., who is president of the association, presiding. Tuesday afternoon will be given over to an open forum on current problems facing members. New officers will be elected at that time.

TRANSITION TOPICS

LABOR-MANAGEMENT— Representatives of industry and unions seek ways to minimize industrial strife at Washington conference. U. S. Steel refuses to reopen wage parley until price relief is granted. See pages 89, 91.

SURPLUS STEEL PLANTS— Senate committee studies policies for disposing of government-owned units. U. S. Steel, once virtually excluded as prospective lessee or purchaser of Geneva plant, now favored by government spokesmen. See page 92.

CIVILIAN GOODS— Production of peacetime products being hampered by shortages of labor and components. See page 95.

WAGES— Commerce Department's statement that automotive wages could be increased without compensating rise in prices assailed by manufacturers. See page 105.

DESCALING STAINLESS STEEL— Sodium hydride process of descaling stainless steel may be better appreciated when it becomes known it is first pickling method with no deleterious effect on surface or structure. See page 122.

STAMPING MARVEL— A sample of potentialities of some machines going to work on commercial products is record of press producing one million stampings per 48-hour week. See page 124.

House Judiciary Committee Blesses Limit on Retroactive Pay Increases

H. R. 2788 considered one of most important "business-relief" bills submitted to Congress in years. Would protect employers from liabilities arising from arbitrary rulings and interpretations by government agencies and administrators

H. R. 2788, which would establish a statute of limitations against retroactive pay increases under numerous federal laws which do not contain a specific statute of limitations, has been approved by the powerful House Judiciary Committee. The bill is considered by many to be the most important "business relief" measure introduced in Congress in years.

The bill was introduced March 27, 1945, by Rep. John W. Grimes, Iowa, who in a series of hearings showed that many employers without warning find themselves liable for huge sums, often threatening them with bankruptcy. Liability, he showed, often comes from arbitrary interpretations and rulings by the administrators of the agencies involved.

"It is often," Mr. Grimes reported, "where a new interpretation is applied that an employer for the first time finds himself liable for large sums for past services of individuals, many of whom may no longer be in his employ, but whose right to collect can be asserted as much as 12 years later.

"A good illustration arises from the operation of the Fair Labor Standards Act. An employer who violates the provisions of this law relating to wages or hours may be subjected to suit for twice the amount involved together with costs and attorneys' fees. The application of this law has been greatly extended by administrative regulations.

"As a result an employer who may have, in good faith, relied upon a cer ruling, regulation or practice, sudd finds himself confronted with many when a change is made either by the ministrator or by the courts. The forcement of this new liability da back to the enactment of the law w in many cases bankrupt the employ

Out of hundreds of cases, Mr. Gr cited a few typical ones.

Some years ago, he said, the W and Hours administration found cookhouse personnel in logging c were not under the act. Three later it reversed this opinion and that employers would be require make retroactive overtime pay ad ments to cookhouse employees.

Whereas the Wages and Hours ad istrator held that "travel time" of miners was not work time, the Sup Court later decided it was work This decision had the practical effe creating new and unforeseen conti liabilities.

In Brooklyn Savings Bank vs. O (323 U. S. 698), the Supreme Cour cided that the action given for liquic damages under the Fair Labor Stand Act could not be waived by agree between the employer and the emplo

"Similar instances might be pointe of cases arising under the Public tracts Act, the Clayton Act, the She Act and many others," reported Grimes. "For example, the Sup Court, in the case of United State South-Eastern Underwriters Associ (322 U. S. 538), held that insurance t actions across state lines constitute terstate commerce, thereby reve prior decisions of 75 years' standing, mediately such transactions became ject to the antitrust laws, and insur companies might be subjected to suit treble damages for doing the very th the court formerly said were lawful which the various states in some stances actually required."

Would Benefit Small Employers

The proposed law, according to report of Rep. Sam Hobbs (Dem., A chairman of the Judiciary Commi will be particularly beneficial to s employers who "generally do not the large legal staff necessary to them posted daily on the volume of ministrative regulations, rulings, and terpretations issued by government reaus. Volumes are published and tributed weekly. . . . Even if he co accomplish the remarkable feat of un standing and complying with all this would still not be safe. For with notice these rules might be changed that which was lawful when done becomes unlawful in retrospect."

H. R. 2788 would: 1—Require that causes of action accruing after its en ment be commenced within one year; require that all causes of action wh had accrued prior to its enactment which had not already become bar

PROPOSES SCIENCE PROGRAM: Testifying before the Senate Military Affairs and Commerce subcommittee hearing on the science program bill, Bernard Baruch, right, suggested a "science cabinet" consisting of men selected solely for the contributions they could make to the advancement of science. Mr. Baruch is pictured here with Sen. Harley M. Kilgore of West Virginia. NEA photo

SENATE ATOMIC COMMITTEE: Newly appointed members of the Senate Atomic Committee are shown at their first meeting. Left to right, front: Edwin C. Johnson of Colorado; Millard Tydings, Maryland; Biren McMahon, Connecticut; Arthur Vandenberg, Mich. Second row: Thomas Hart, Connecticut; Eugene Millikin, Colora Warren Austin, Vermont; and Bourke Hickenloop Iowa. Members not included in photograph are Ha Byrd, Virginia; Richard B. Russell, Georgia; and T Connally, Texas. NEA photo

by any applicable statute of limitation be commenced within six months after such enactment; 3—provide protection to all persons who had in good faith relied upon any regulation, order, or administrative practice, notwithstanding any subsequent amending or rescinding of such regulation, order or administrative practice.

Specifically, the Grimes bill would affect causes of action for the recovery of wages, penalties or other damages as follows:

1. Suits for treble damages based on infringement of a registered trade-mark (15 U. S. Code, sec. 96).

2. Suits based on infringement of copyrights (17 U. S. Code, sec. 25).

3. Actions for treble damages against persons importing goods into the United States and selling the same systematically at less than the market value with intent to injure an industry in the United States or to create a monopoly (15 U. S. Code, sec. 72).

4. Suits for treble damages and costs including attorney fees for violation of antitrust laws (15 U. S. Code, sec. 15).

5. Actions for damages for violation of the so-called Civil Rights Statutes (8 U. S. Code, sec. 43).

6. Suits for double the amount involved plus costs and attorney fees for violation of sections of the Fair Labor Standards Act relating to minimum pay and maximum hours (29 U. S. Code, sec. 216).

7. Suits for wages due merchant seamen, plus penalties (46 U. S. Code, sec. 596).

8. Actions by the United States to recover penalties for failure to comply with certain provisions of the Packers and Stockyards Act of 1921 (7 U. S. Code, sec. 207).

9. Actions by the United States to recover penalties based on failure to file certain statements with the Federal Trade Commission (15 U. S. Code, sec. 65).

10. Suits against directors of national banking associations for knowingly violating certain banking laws (12 U. S. Code, sec 93).

11. Suits by the United States to recover penalties for failure to file certain information, documents, or reports under the Securities Exchange Act of 1938 (15 U. S. Code, sec. 78 ff.).

12. Suits to recover treble the amount of illegal fees knowingly collected by any consular officer (22 U. S. Code, sec. 92).

13. Suits by the United States for liquidated damages based on failure of any contractor to comply with terms of contract as to wages, hours, etc. (41 U. S. Code, sec. 36).

14. Suits by the United States for fixed amounts of damage under the Contract Settlement Act of 1944 (41 U. S. Code, Supp. IV, sec. 107 (d)).

15. Suits to recover penalties against registers of public lands for giving false information in regard to registering of land (43 U. S. Code, sec. 107).

16. Suit by the United States to recover penalty of $1000 per day from common carriers by water for failure to file with the United States M Commission copies of certain agre with other carriers (46 U. S. Cod 814).

17. Suit for treble damages certain carriers by water who discri against other carriers (46 U. S. Co 1227).

18. Suits against common carrie ject to the provisions of chapte title 49, United States Code, for tion of provisions of said chapte 49, sec. 8).

19. Suits brought by the States against persons who defra government in connection with t posal of surplus property (Surplus erty Act of 1944, sec. 26).

Moves To Permit Sales In Small Quantities

W. Stuart Symington, surplus p ty administrator, at the instance Senate Small Business Committee authorized sale of surplus govern owned consumer goods in quantitie ficiently small to provide opportu to small business. War Assets the new RFC subsidiary organiz take over the sale of consumer from the Office of Surplus Pro Department of Commerce, has called upon by the Surplus Property ministration to sell "to the extent ble" in "sufficiently small quantiti enable small independent retailers

normally buy direct from manufacturers to participate in such offerings."

Furthermore, the new policy calls for the establishment of a second minimum quantity which shall be applicable to the wholesale trade, and wholesale purchasers of such items should agree to use their best efforts to resell to small retail establishments unable or unwilling to buy in quantities as large as the retail minimum. Prices of surplus goods which are offered to wholesalers, according to the new policy, should be such as to compensate wholesalers for their distributive function. In establishing such prices the disposal agency should take into consideration (1) the type of goods, (2) the turnover potential, (3) the cost of care and handling, (4) the volume and (5) the quantity offered.

The new policy also indicates that large retailers such as chain stores, mail order houses, and co-operative organizations which usually perform an intermediate distributive function should be permitted to buy surplus consumer goods at a discount of not more than 5 per cent from the net prices which small retailers are required to pay. In establishing prices, OPA selling prices should be taken into account.

All But 12 Antitrust Law Immunity Orders Revoked

All but 12 out of 215 antitrust law immunity certificates issued by the chairman of the War Production Board to permit wartime pooling of industrial facilities, patent rights and technical information had been revoked on Nov. 1. The outstanding certificates were issued to aid the public procurement program of Philippine hemp and copra and to aid the rubber programs.

India Relaxes Steel Import Licensing for Sterling Bloc

Less restricted licensing of steel imports, confined to purchases from the sterling countries, however, has been decided upon by the government of India.

The modification of requirements for steel imports, it was said, is made possible by the improved supply position of the United Kingdom in certain steel items for which the Indian authorities require import licenses. The change affects United Kingdom, Australia, South Africa, and other sterling bloc sources.

Supplies covered include iron and steel wood screws, roofing bolts and nuts, galvanized roofing screws, rose head nails, light hand tacks, blue cut clout shoe tacks, panel pins, bifurcated and tinman rivets, stitching wire, telescopic flush pipes, iron and steel valves, steel conduits, wire netting, wire mesh, wire chains, wire linking fencing, chains, forged steel balls for the cement industry, horse and bullock shoe nails, boot protectors and washers.

Experiment To Manufacture Liquid Fuel from Farm Wastes Under Way

Department of Agriculture's research laboratory of Peoria, Ill., to test feasibility of converting corncobs into alcohol and by-products. Success may indicate large potential market for equipment, not only at home but in foreign countries

WHETHER or not a large potential market exists for equipment to manufacture liquid motor fuel from agricultural waste will be determined over the coming months at Peoria, Ill., where, at the Department of Agriculture's Northern Regional Research Laboratory, will be launched the most ambitious program of this character yet undertaken in this country. The necessary equipment has been delivered and will be placed in operation as soon as installed.

The project is covered by a special appropriation of Congress which aims at finding in the field of motor fuel a profitable way of disposing of farm wastes. Around 200 million tons of such wastes are produced each year, of which about 100 million tons are plowed back into the soil to help maintain fertility and prevent erosion. The objective is to find a use for the remaining 100 million tons.

Corncobs will be the first of these so-called waste materials to be tried out in the new plant. Later the program will be extended to include sugarcane bagasse, peanut shells, flax shives, oat hulls and cottonseed hulls and burrs. Experimental laboratory investigations by department chemists in previous years indicate that from 90 to 95 gallons of liquid motor fuel should be obtained from a ton of such wastes.

Would Yield Valuable By-products

But the project is aimed at production not only of alcohol but of valuable by-products which will lower the cost of the alcohol. These would include lignin, xylose and furfural which sell at higher prices than alcohol or dextrose. Later on, it is hoped, the range of by-products will be extended further. To this end, the program will be in the hands of approximately 15 of the best scientists at the laboratory. Initially, the new plant is to produce approximately 2000 pounds of dextrose, 1600 pounds of xylose, 1000 pounds of lignin and 200 pounds of furfural from 5500 pounds of corncobs or other waste in an eight-hour operating period.

Department of Agriculture chemists regard the outlook as promising in the light of some cost data they already have accumulated experimentally. They estimate that the total costs should be somewhere in the neighborhood of $21 for complete conversion of a ton of corncobs; this would include $6 for the corncobs, $5 for chemicals, $5 for other costs, and $5 for fixed charges. The sales value of the product, at prewar sales prices for xylose, furfural, alcohol and lignin, they figure, should be somewhere in the neighborhood of $35 to $36. That would allow a margin of $15 to $16 for sales expense and profit.

Main units of equipment include a commercial cob crusher; a pentosan hydrolizer in which the ground cobs are to be treated with hot-dilute sulphuric acid; a machine with an ingenious "dis-continuous" screw for sulphuric acid impregnation of the solid residue left after hydrolysis; also numerous other units as filters, a vacuum still, fermenters, a xylose crystallizer, etc.

The proposed research will be carried on in close co-operation with other investigations already under way at the Northern Regional Research Laboratory which, as part of its regular research program, has a large pilot plant for the conversion of carbohydrates, by fermentation, to such liquid fuels as alcohol, butanol, and acetone, as well as facilities for testing motor fuels.

The work to be done at Peoria, interested Department of Agriculture technicians believe, will not only prove helpful to our economy in permitting more complete use of farm products, but will help United States manufacturers in the development of motors for export sale. The Latin American republics, China and other countries, they believe, will want to make extensive use in the postwar era of motors using alcohol as fuel.

Filing of Claims on War Contract Terminations Lag

Contractors wishing to close their tax books for 1945 should file their claims on terminated war contracts as soon as possible, Brig. Gen. D. N. Hauseman of the Army's Readjustment Division, said recently. The commissioner of internal revenue has ruled that for all companies not on a cash basis, money received in final settlement of war work must be considered as income in the tax year that the war contracts were terminated, no matter when final payment is made. At the beginning of October, claims had been filed on only slightly more than 10 per cent of the total number of contracts pending. During September, 12,049 war contracts were settled, leaving about 65,000 more terminated contracts to be settled.

New Data Are Included in Steel Institute's Statistical Report

Details of balance sheet and income data, number of employees, hours worked and wages paid, consumption of coke by pig iron and steel producers are added. Figures on foreign production and shipments still unavailable

SEVERAL new tables are included in the thirty-third Annual Statistical Report, just published by the American Iron & Steel Institute, presenting comprehensive statistics for the industry for 1944.

One new set of tables shows details of balance sheet and income data.

Another new table shows the number of employees, hours worked and wages paid to employees who are engaged in the production and sale of iron and steel products. This shows average hourly wages rose from $0.915 in 1940 to $1.261 in 1944.

Also included for the first time are figures showing the consumption of coke by pig iron and steel producers.

As in recent years, figures on foreign production, imports and exports are lacking for the war years.

The report's figures on steel ingot capacity (average as of Jan. 1 and July 1, 1944) show capacity was increased 3,265,230 net tons over 1943 to 93,854,420 net tons annually.

(W. A. Hauck's report on Steel Expansion for War, STEEL, June 18, page 98, indicated steel ingot and castings capacity on Jan. 1, 1945, to be 95,505,280 net tons annually).

Production in 1944 was 89,641,600 net tons, 95.5 per cent of capacity, compared with 88,836,512 net tons, 98.1 per cent of capacity, in 1943.

Blast Furnace Capacity Rises

Blast furnace annual capacity for pig iron and ferroalloys increased 3,733,190 net tons to 67,921,410 tons in 1944 from 64,188,220 tons in 1943. Production rose to 62,072,683 tons or 91.4 per cent of capacity in 1944 from the 1943 figure of 61,895,314 or 96.4 per cent capacity. During 1944 the total pig iron and ferroalloys for sale was 9,505,692 net tons compared to 10,721,631 net tons in 1943.

Two blast furnaces were added in 1944, one at South Chicago, Ill., and one at Houston, Tex., adding 724,000 to annual pig iron capacity. Work was suspended during the year on two other blast furnaces with a total of 859,000 tons pig iron capacity, one at Indiana Harbor, Ind., the second at Monessen, Pa.

Abandoned or dismantled during the year were six blast furnaces aggregating 1,061,400 tons annual capacity, three at Mingo Junction, O., one at Riddlesburg, Pa., one at Sharpsville, Pa., and one at Holt, Ala. Also abandoned were a 600,000 ton bessemer steel plant at Mingo Junction, O., an open-hearth furnace of 178,000 tons capacity at St. Louis, and several rolling mills for production of rods, bars, shapes, and light rails at Allentown, Pa., Coatesville, Pa., Lebanon, Pa., Philadelphia, Cleveland, Newark, O., Syracuse, N. Y., and St. Louis.

The steel industry's total investment in 1944 was $4,471,761,987 compared to $4,502,759,774 in 1943. Earnings before dividends and interest were $208,625,053 or 4.67 per cent of investment, against $227,942,774 or 5.06 per cent for 1943. Cash dividends paid were $118,952,893 to 492,509 stockholders at y end compared to $148,749,156 and 005 stockholders in 1943.

Total wages and salaries were $2, 954,365 against $2,653,504,759 in There were 869,493 employees in 1944 compared to 958,284, highe record, in the same period of 1943. ly hours averaged 46.3 in 1944 a 42.8 in 1943, and average hourly ings were $1.261, against $1.181 in

Federal, state and local taxes $464,996,548 against $617,119,13 1943.

Net billings of the industry were 590,505,736 in 1944 against $6,620, 535 in 1943, and other revenues $22,954,953, against $25,479,803 preceding year. Current assets Dec. 31, 1944, were $2,587,875,855 pared to $2,497,528,745, and c liabilities were $971,203,230, agains 054,595,037 in 1943.

Tables on facing page show th tribution of steel products to cons industries in 1944.

Zimmerman Traces Steel Industry's Grow Customers' Needs Stimulated Developme

DEVELOPMENT of the United States steel industry since its beginning 300 years ago was traced by R. E. Zimmerman, vice president in charge of research and technology, United States Steel Corp., as part of the celebration of the golden jubilee of the automobile at the Museum of Science and Industry, Chicago, Nov. 3.

Steel, Dr. Zimmerman said, achieved its growth by helping other industries to grow. Among customer industries which increased the variety of their demands for new steel composition he mentioned the railroads, the automobile, petroleum, electrical and farm equipment manufacturers.

"In the early years of railroad transportation, the modern rail, with its toughness, strength, hardness and ability to withstand wear and heavy impacts, would have figuratively withered on the vine. Today rails represent the last word in production of fine steel. Rail steels, however, would not make the best wheels or axles or cars, because requirements of service are different."

In the beginning, the automobile used varieties of steel available at the turn of the century, Dr. Zimmerman said. Mainly these were of higher or lower carbon content, with only a few alloys. The aggressive and dynamic auto industry, however, continually demanded better steels for a multitude of parts.

"As a result," said Dr. Zimmerman, "no single enterprise in America has done more than the automotive industry to inspire the rapid development of alloy steels for mechanical purposes.

A factor which has had profou fluence on progress and variety in Dr. Zimmerman said, is the progre ly closer association of science wi dustry. The early chemists, phy and engineers generally built fund of knowledge which in later provided a "sure foundation upon to erect a usable science of metals." allography, almost unknown in 189 came an indispensable standby o steel technologist and industrial re organizations and laboratories hav peared on the scene year after y increasing numbers.

While stainless steel of the chro nickel variety was patented in Ge in 1912 and Brearley, in En brought the plain chromium st series to the stage of commercial duction in 1913, modification of varieties have been perfected i United States and a noteworthy s member of the famous 18-8 chro nickel family came into prominen 1930 in the form of the lightw streamlined passenger train.

Throughout the period of dev ment in the alloy steel field, Dr. merman said, the carbon steels wer target of intensive metallurgical re because of their vast economic technical importance. These steels been the central theme of prolo studies in the physical chemistry steel making, of systematic investiga in the effects of hot and cold wo and the perfection of scientific treatment.

ANALYSIS OF STEEL PRODUCT DISTRIBUTION IN 1944

(Source: American Iron & Steel Institute. All figures in net tons)

Classification of Billing of Products by Consuming Industries—Year 1944

(As reported by companies producing more than 95 per cent of the year's output)

Industries	Ingots, Blooms, Billets, Slabs, Tube Rounds, Sheet and Tin Bars, Etc. (1)	Heavy Structural Shapes and Steel Piling (2)	Plates (Universal and Sheared) (3)	Rails: Over 60 lbs. (4)	Rails: All Other (5)	Splice Bars, Tie Plates and Track Spikes (6)	Hot Rolled Bars: Carbon, including Hoops and Bands (7)	Hot Rolled Bars: Concrete Reinforcing (8)	Hot Rolled Bars: Alloy (9)	Cold Finished Bars (Carbon and Alloy) (10)	Pipe and Tubes (11)	Wire Rods (12)	Wire: Drawn, Nails & Staples, Barbed & Twisted, Woven Fence, Bale Ties (13)	Industries
1. Steel Converting and Processing Industries														1.
(a) Wire drawers and wire product mfrs.	120,112	5	176	.....	.....	.....	10,881	.....	10,480	3,339	−2,393	522,683	416,420	(a)
(b) Bolt, nut, and rivet manufacturers	73,043	533	1,730	.....	.....	5	570,957	.....	24,829	67,192	1,555	321,478	198,746	(b)
(c) Forging manufacturers														(c)
(1) Automotive and Aircraft	322,129	7	1,188	.....	1,254	.....	95,711	.....	217,877	2,466	557	1,358	1,075	(1)
(2) All other	1,329,020	48	44,781	.....	.....	.....	184,203	15	114,824	1,081	27,768	3,420	777	(2)
(d) All other steel plants and foundries	2,548,478	22,696	284,927	7,396	2,303	39,770	1,161,726	2,056	193,033	8,995	155,463	73,931	66,503	(d)
Total	4,393,682	23,259	332,802	7,396	3,557	39,775	2,023,478	2,071	561,043	83,073	182,950	922,870	683,521	Total
2. Jobbers, Dealers and Distributors														2.
(a) Oil and natural gas industry	4,765	2,768	7,332	.....	.....	6	2,607	53	1,789	162	549,888	.....	1,160	(a)
(b) All other	18,935	569,116	770,766	5,003	10,475	12,386	912,920	74,388	47,825	379,576	1,504,672	9,820	1,261,365	(b)
Total	23,700	571,884	778,098	5,003	10,475	12,392	915,527	74,441	49,614	379,738	2,054,560	9,820	1,262,525	Total
3. Construction Industry														3.
(a) Public (Municipal, State, National)	104	6,018	4,997	105	8	121	1,589	17,332	95	163	9,992	402	2,228	(a)
(b) Highways	3,559	53,747	30,156	.....	.....	.....	16,361	11,461	665	614	535	47	4,668	(b)
(c) Railways	104	41,634	27,165	50	3	9,120	3,421	2,778	277	7,154	8,745	373	22,027	(c)
(d) Automotive and Aircraft	107	19,105	11,009	22	8	34	6,942	1,556	217	45	871	315	1,273	(d)
(e) Utilities	5,053	27,600	43,303	1,223	9,126	446	35,236	8,715	1,198	713	4,942	476	1,201	(e)
(f) Bldg. trim, accessories and builders' hdw.	111	39,421	29,003	440	.....	5	43,113	12,382	427	266	69,318	274	9,835	(f)
(g) All other	34,941	585,106	642,910	17,099	7,481	5,420	245,730	222,554	565	1,131	18,396	1,087	12,055	(g)
Total	44,639	789,637	789,503	18,939	16,626	15,146	351,992	276,778	12,409	4,564	198,500	13,760	129,160	Total
4. Shipbuilding Industry	212,903	1,618,793	6,976,678	172	139	276	476,262	12,364	77,160	42,177	272,363	1,648	47,049	4.
5. Pressing, Forming and Stamping Industry														5.
(a) Metal furniture and office equipment	.....	75	14,305	.....	.....	.....	11,170	.....	164	4,186	8,622	6,050	49,092	(a)
(b) Hardware and household equipment	24	163	4,820	.....	.....	.....	8,536	.....	277	7,154	8,745	373	22,027	(b)
(c) Automotive	20,193	9,424	145,218	.....	71	.....	281,414	.....	169,898	30,537	33,814	22,574	34,182	(c)
(d) All other	870	3,248	79,395	53	.....	.....	29,689	.....	1,900	3,468	26,690	7,289	96,563	(d)
Total	21,085	12,910	243,738	53	71	.....	329,809	.....	172,239	45,345	77,841	36,286	201,864	Total
6. Container Industry														6.
(a) Oil and natural gas industry	49,220	408	12,437	.....	.....	.....	4,517	.....	627	178	37	7	1,273	(a)
(b) All other	14	193	61,964	.....	.....	.....	23,086	.....	173	123	890	80	100,138	(b)
Total	49,234	601	74,401	.....	.....	.....	27,603	.....	800	298	927	87	101,411	Total
7. Agricultural, Incl. Impl. & Equip. Mfrs.	16,875	33,826	56,080	.....	.....	.....	452,462	.....	38,547	67,400	26,195	10,617	40,251	7.
8. Machinery and Tools														8.
(a) Machinery and tools, not incl. elect. equip.	126,771	114,780	354,483	2,244	1,416	130	406,707	.....	81,206	143,651	189,446	8,278	25,526	(a)
(b) Electrical machinery and equipment	6,385	12,139	99,248	.....	110	72	53,036	.....	14,700	30,572	53,163	35,404	58,707	(b)
Total	133,156	126,925	453,731	2,244	1,526	202	459,743	.....	96,096	174,223	243,609	43,682	84,233	Total
9. Automotive and Aircraft Industry	135,746	55,293	238,923	.....	476	10	272,440	.....	291,423	241,485	120,694	3,286	45,755	9.
10. Railroad Industry														10.
(a) All railroads	95,400	88,019	313,271	1,967,927	15,002	773,295	232,056	.....	7,947	3,981	30,040	406	25,626	* (a)
(b) Car and loco. builders and parts mfrs.	31,195	283,957	526,902	28,962	568	16,647	248,646	.....	11,500	4,931	20,092	132	7,942	(b)
Total	126,595	371,976	840,173	1,996,289	15,570	789,942	480,702	.....	19,447	8,912	50,141	538	33,568	Total
11. Oil, Natural Gas and Mining Industry														11.
(a) Oil and natural gas, incl. pipe lines	16,801	47,789	241,722	245	18	151	25,216	.....	34,737	4,759	845,041	.....	5,705	(a)
(b) Mining, quarrying and lumbering	5,255	13,260	33,829	5,267	50,405	7,264	45,854	.....	4,727	2,256	17,157	171	6,535	(b)
Total	22,116	61,049	275,551	5,512	50,423	7,415	71,070	.....	39,464	7,015	863,098	171	12,240	Total
12. Miscellaneous Industries and Export	3,011,755	267,522	1,132,026	255,171	39,348	76,385	1,014,454	248,077	555,449	911,892	1,108,153	215,741	612,736	12.
13. Total (Items 1 to 12)	8,191,288	3,913,675	12,191,710	2,290,779	143,211	941,543	6,875,542	613,731	1,916,858	1,908,964	5,301,885	1,261,167	3,285,543	13.
14. Less Shipments to Members of the Industry for Conversion or Resale	2,408,681	724	236,151	343	1,225	20,737	855,078	21	203,799	1,270	42,382	375,390	84,691	14.
15. Net Total	5,782,605	3,912,951	11,955,559	2,290,436	141,986	920,806	6,020,464	613,710	1,713,059	1,907,694	5,259,503	885,777	3,200,852	15.

Industries	Black Plate (14)	Tin and Terne Plate (15)	Sheets and Strip: Hot Rolled (16)	Sheets and Strip: Cold Reduced (17)	Sheets and Strip: Galvanized (18)	Tool Steel Bars (19)	Wheels and Axles (20)	Skelp (21)	All Other Steel Products (22)	Total Steel Products (23)	Less Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (24)	Net Total (25)	Industries
1. Steel Converting and Processing Industries													1.
(a) Wire drawers and wire product mfrs.	23	.....	17,850	10,971	93	157	.....	.....	355	1,111,152	469,842	641,310	(a)
(b) Bolt, nut, and rivet manufacturers	79	.....	14,768	4,875	23	41	.....	.....	....	1,279,854	126,859	1,153,995	(b)
(c) Forging manufacturers													(c)
(1) Automotive and Aircraft	.....	.....	312	91	166	47	10	.....	....	644,248	47,277	596,971	(1)
(2) All other	.....	.....	42,778	941	27	1,304	10	.....	....	1,751,892	194,889	1,557,003	(2)
(d) All other steel plants and foundries	4,144	388	750,872	146,2347	3,978	849	1,999	686,973	261	6,162,948	4,522,885	1,640,063	(d)
Total	4,246	388	826,580	163,115	4,282	2,398	2,019	688,973	616	10,950,094	5,360,752	5,589,342	Total
2. Jobbers, Dealers and Distributors													2.
(a) Oil and natural gas industry	103	.....	128	40	72	42	.....	.....	.....	570,921	.....	570,921	(a)
(b) All other	83,339	36,902	727,555	432,505	536,948	14,370	171	.....	19,118	7,437,155	.....	7,437,155	(b)
Total	86,442	36,902	727,683	432,551	537,020	14,412	171	.....	19,118	8,008,076	.....	8,008,076	Total
3. Construction Industry													3.
(a) Public (Municipal, State, National)	.....	.....	19,970	2,712	6,348	5	.....	.....	2	72,191	.....	72,191	(a)
(b) Highways	.....	23	5,900	129	45,281	2	.....	.....	167	173,315	.....	173,315	(b)
(c) Railways	13	.....	481	274	45	124	.....	.....	22	87,755	.....	87,755	(c)
(d) Automotive and Aircraft	.....	.....	55,078	3,568	3,490	7	.....	.....	....	109,516	.....	109,516	(d)
(e) Utilities	.....	870	16,904	1,763	80	82	5,434	.....	48	236,039	.....	236,039	(e)
(f) Bldg. trim, accessories and builders' hdw.	6,298	1,112	159,290	61,408	54,343	.....	282	.....	11	438,323	.....	438,323	(f)
(g) All other	1,783	510	993,516	80,362	130,842	750	2,883	.....	926	3,336,746	.....	3,336,746	(g)
Total	8,004	2,515	1,251,139	150,216	240,429	970	8,599	.....	1,176	4,454,485	.....	4,454,485	Total
4. Shipbuilding Industry	822	927	370,553	59,783	114,705	1,033	535	.....	957	10,287,299	.....	10,287,299	4.
5. Pressing, Forming and Stamping Industry													5.
(a) Metal furniture and office equipment	1,115	1,267	26,882	30,530	5,551	.....	.....	.....	8	159,017	.....	159,017	(a)
(b) Hardware and household equipment	41,624	8,075	111,447	125,761	29,031	2	.....	.....	892	369,549	.....	369,549	(b)
(c) Automotive	8,424	18,295	354,327	145,793	11,748	1	.....	.....	.....	1,285,913	.....	1,285,913	(c)
(d) All other	28,156	7,147	534,121	234,366	33,929	84	.....	.....	999	1,106,834	.....	1,106,834	(d)
Total	79,319	34,784	1,026,777	536,450	100,756	87	.....	.....	1,899	2,921,313	.....	2,921,313	Total
6. Container Industry													6.
(a) Oil and natural gas industry	7,841	33,814	232,761	54,790	2,077	29	.....	.....	.....	400,007	.....	400,007	(a)
(b) All other	305,445	1,985,033	558,403	213,752	45,894	39	.....	.....	1,060	3,296,374	.....	3,296,374	(b)
Total	313,286	2,018,847	791,254	268,542	47,971	59	.....	.....	1,060	3,696,381	.....	3,696,381	Total
7. Agricultural, Incl. Impl. & Equip. Mfrs.	792	3,867	241,726	21,187	81,642	29	.....	.....	496	1,091,798	.....	1,091,798	7.
8. Machinery and Tools													8.
(a) Machinery and tools, not incl. elect. equip.	2,193	1,948	146,625	64,999	4,261	17,970	6,215	.....	32	1,690,077	.....	1,690,077	(a)
(b) Electrical machinery and equipment	3,062	1,343	311,917	109,488	7,460	992	78	.....	331	706,226	.....	706,226	(b)
Total	5,255	3,291	458,542	174,487	9,740	18,962	6,293	.....	363	2,486,303	.....	2,486,303	Total
9. Automotive and Aircraft Industry	5,178	960	384,765	218,778	22,865	940	8	.....	41	2,039,086	.....	2,039,086	9.
10. Railroad Industry													10.
(a) All railroads	84	49	61,381	2,287	35,035	283	206,912	.....	335	3,988,455	.....	3,988,455	(a)
(b) Car and loco. builders and parts mfrs.	21	.....	179,867	8,009	7,460	259	179,853	.....	.....	1,556,313	.....	1,556,313	(b)
Total	105	49	241,248	10,296	42,495	542	386,765	.....	335	5,424,798	.....	5,424,798	Total
11. Oil, Natural Gas and Mining Industry													11.
(a) Oil and natural gas, incl. pipe lines	315	581	37,238	1,789	3,567	62	47	.....	112	1,266,855	.....	1,266,855	(a)
(b) Mining, quarrying and lumbering	.....	61	14,417	1,175	1,815	514	1,706	.....	812	212,480	.....	212,480	(b)
Total	315	642	51,655	2,964	5,382	576	1,753	.....	924	1,479,335	.....	1,479,335	Total
12. Miscellaneous Industries and Export	105,241	487,167	1,528,695	933,094	180,221	10,765	37,300	152,216	12,177	12,874,474	.....	12,874,474	12.
13. Total (Items 1 to 12)	609,005	2,590,339	7,900,617	2,971,463	1,373,528	50,773	443,452	839,189	39,182	65,713,412	5,360,752	60,352,660	13.
14. Less Shipments to Members of the Industry for Conversion or Resale	2,106	383	488,449	30,247	3,353	169	63	607,490	.....	5,360,752	.....	.....	14.
15. Net Total	606,899	2,589,956	7,414,168	2,941,216	1,370,175	50,604	443,389	231,699	39,182	60,352,660	.....	60,352,660	15.

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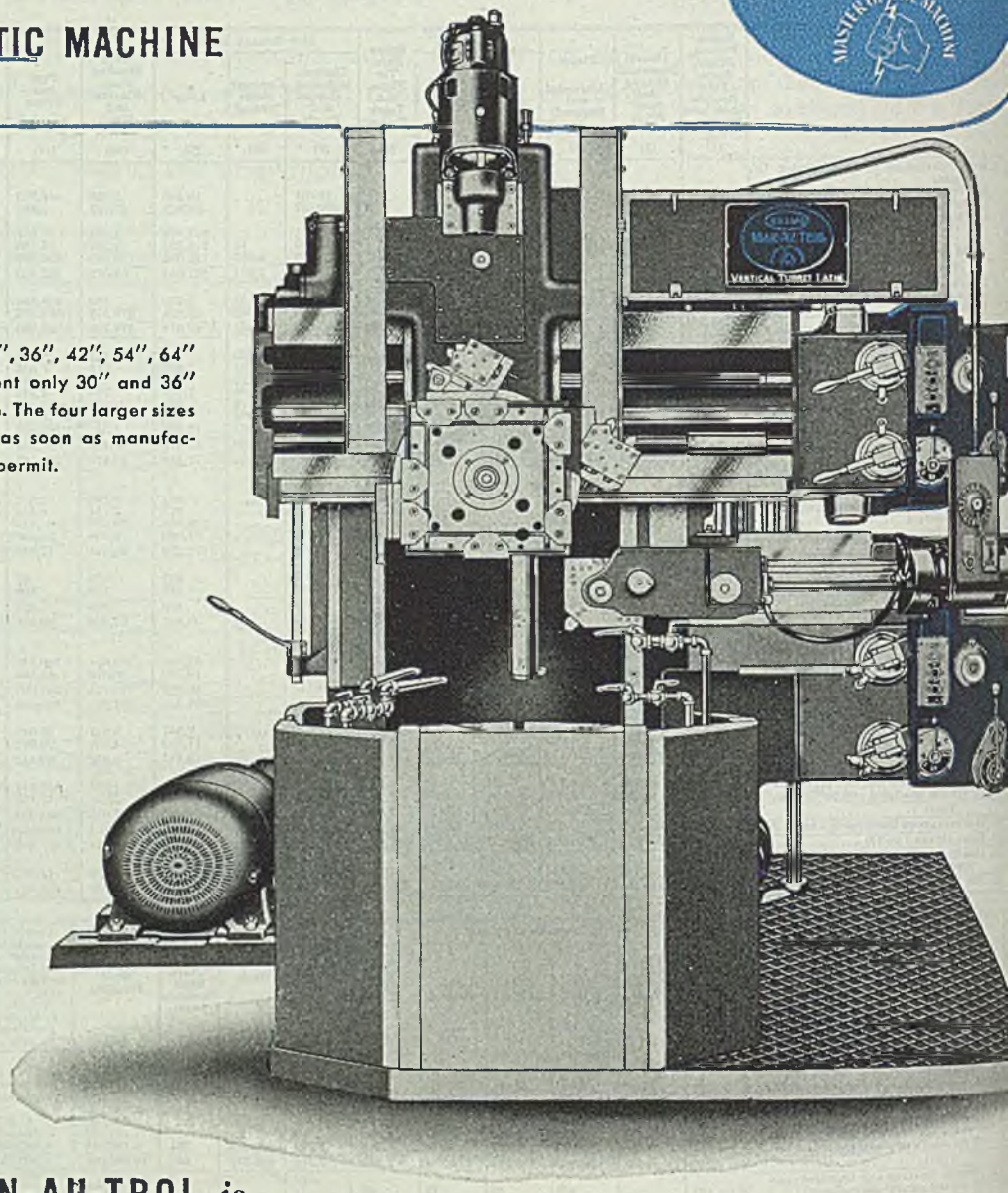

Machine sizes: 30", 36", 42", 54", 64" and 74". At present only 30" and 36" sizes are available. The four larger sizes will be available as soon as manufacturing conditions permit.

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When you decide to buy a Bullard MAN-AU-TROL V.T.L., your chief reason will be that you want all the benefits of an automatic lathe *plus* all the versatility of a manually-operated machine.

To these benefits, add another. Suppose you have your MAN-AU-TROL V.T.L. all set up for automatic production of a piece with Bullard standard-type tooling. Along comes a rush job for one piece of an entirely different kind. The chances are that you will find it profitable to change the tool set up for manual operation on this one piece without, of course, disturbing the automatic cycle. that one-piece job is finished, you quickly reset your ing by means of gauges, and before you know it, machine is back on the production run with the auto cycle.

Other benefits you will get from the Bullard MAN TROL V.T.L. are fully described in Bulletin MAV- Write today. The Bullard Company, Bridgeport 2, C

BULLARD CREATES *NEW METHODS* TO MAKE MACHINES DO MO

by A. H. ALLEN Detroit Editor, STEEL

MIRRORS of MOTORDOM

Frankensteen defeated in Detroit mayoralty bid, despite vigorous campaign by CIO's Political Action Committee. Declaration by Wallace that automakers could raise wages without increasing prices brings sharp rebuttal

DETROIT

WITH this city's mayoralty campaign now out of the way, and the incumbent, Edward J. Jeffries Jr., elected to a fourth term by a comfortable majority of 35,394, motordom can turn its attention to other aspects of the "period of reconversion" as George Christopher of Packard so aptly terms it. Total vote was a new record, exceeding 501,000, and was watched throughout the country as a measure of the strength of the CIO's Political Action Committee which masterminded the campaign of Richard T. Frankensteen, vice president of the UAW-CIO.

The mayor's majority was nearly double his 32,000 lead in the 1943 nonpartisan election, when he ran against the CIO-backed candidate Fitzgerald. The vote ran pretty much as predicted, running within 0.1 per cent of a preelection poll conducted by the *Detroit News*. Negro vote, as expected, was better than 90 per cent for the union candidate, but in workingmen's districts and foreign language neighborhoods, where the PAC counted on heavy majorities, the count ran just the opposite, Jeffries leading in most of them.

All incumbent members of the city council were re-elected, one of them, Lt. George Edwards, still in the military service, being elevated to the council presidency, probably as the result of indorsement by the CIO-PAC. Two other union-backed candidates were well down the list.

Pre-election tactics of CIO strategists run the gamut from the sordid to the ingenious. Inflammatory appeals to the Negro vote, as noted, were successful, but the tops was an artful dodge to permit PAC vote checkers to determine whether the CIO membership had voted.

City Officials Squelch Trick

The latter scheme, squelched by city officials who were tipped off in advance, was to station PAC representatives at the polling places to hand placards to voters after they had voted. The placards were nothing more than a reproduction of a military discharge emblem and the words, "Welcome home." Entirely innocuous on their face and appealing to the average individual's patriotism, they were to be placed in the front window of the recipient's residence. The neat trick, however, was that their display would enable vote checker squads at once to determine whether CIO members had voted. If not, then the checkers would immediately make inquiries and take such other steps as might be necessary to get out the maximum number of their high-pressure minority group.

Meanwhile, there was more fun going on across the river in Windsor, where 11,000 UAW-CIO workers at Ford of Canada plant have been on strike since September, over nothing more than insistence on a maintenance of membership clause in their contract with the management, something which had been denied by the Canadian labor board. Last week, word came that Canadian mounted police were being sent to disperse picket lines around the plants, so union leaders at once sent out a hurry-up call for reinforcements. They proceeded to seize hundreds of private cars, trucks and buses, ejecting their occupants with threats of violence, and organized the commandeered cars into a solid ring around the plant, completely barricading it.

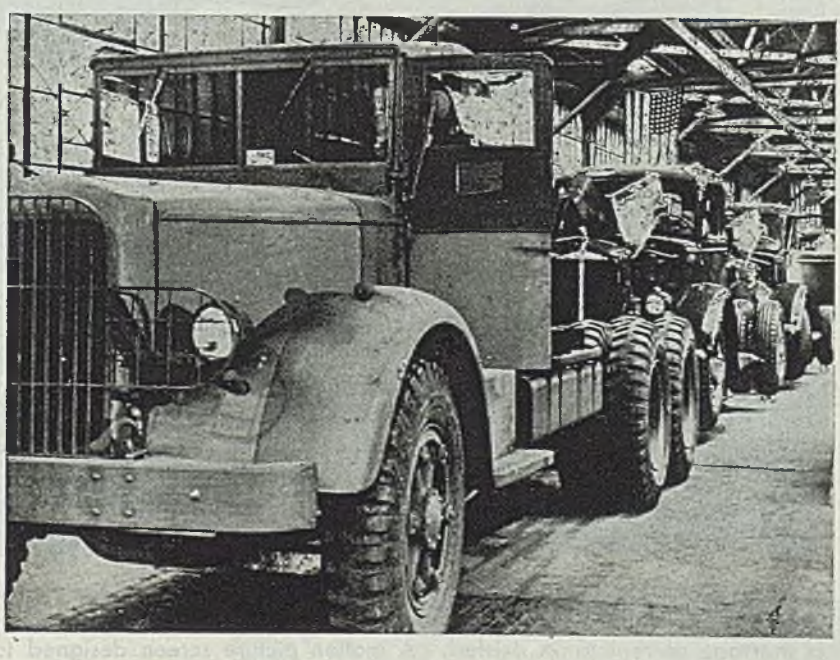
Inside the barricade, hundreds of pickets danced, sang, ate, drank and jeered, while a union sound truck whipped up their enthusiasm by music and oratory. Complaints by owners of seized cars and trucks to Windsor police brought no action, and the mayor of the city, a so-called liberal-laborite who has continuously supported the strike and fought off efforts at any official interference, hurriedly left for Toronto to "hold a conference."

Thousands of union workers in other Windsor plants left their jobs to join the fun. It was estimated something like 30,000 in all were involved, and there were threats of a general strike in sympathy which would paralyze all industry in the city.

Document released in Washington Nov. 1 by Secretary of Commerce Wallace, and purporting to be an "official study" showing why the automobile industry could raise wages 15 per cent next year and up to 25 per cent (over 1945) the two following years without having to increase prices and still earn a handsome profit, is being regarded around Detroit as typical of the fast talking and loose thinking emanating currently from government and union "experts" who in the final analysis are perhaps one and the same. These "loaded" economists reach out into the thin air and glibly talk of so many millions of dollars of sales and profits in the automotive industry over the next few years although the orders were all on the books and the production under way. Where they derive their data and by what devious processes they distort the conclusions are mysteries.

Frank Rising of the Automotive & Aviation Parts Manufacturers Inc., for example, terms the report "as fuzzy and obscure a collection of half-thoughts and nonsense as has been blazoned on the front pages for some time."

He continues, "Who are these people



COLORS CHANGED: End of World War II for Mack trucks is symbolized in this picture which shows the last Army truck rolling off the assembly line followed by the first of the civilian trucks. The dull green of the service vehicles gives way to bright colors for the civilian trucks

who look into a crystal ball, and on a base of hazy assumptions build a set of wobbly conclusions with which to advise the President? Where did they get their data? Whom did they consult on the industrial scene? What opportunity was there for any critical study and analysis before they so arrogantly published that mass of economic tripe? Industry has an obligation to ask such questions, and to insist on complete answers."

Mr. Rising sees the next few months as decisive ones, and points upon three salient principles which practically all manufacturers will support:

1. The only way to increase the standard of living is to produce more goods and services which make up a living. Fair wages for work done is an obvious requirement, but higher wages for work not done will surely result in fewer goods and a declining general prosperity.

2. If profits are deeply cut by national design, and wages are raised by fiat, only the larger and most efficient companies can survive. The smaller firms will go to the wall, and the entrepreneur will be stillborn.

3. Not 1 per cent — much less 30 per cent — increase in wages should be given at the point of a gun and without economic justification. Down such a path lies total oblivion for a free, competitive economy.

In a more blunt tone, Mr. Christopher of Packard asks, "How can anyone expect us to go along with the President and give wage increases now on a basis that if we are not broke in six months we may possibly get some relief? Nobody can force a man in peacetime to run a business if he doesn't want to."

Mr. Christopher based his statement on a previous appeal to OPA for a price increase in service parts which was not acted upon, with the result the Packard service parts department operated at a loss of $310,000 in the first ten months of this year.

The Commerce Department report was discredited in no uncertain terms by George Romney, general manager of the Automobile Manufacturers Association in a letter to Secretary Wallace. He charged economists who had prepared the material had greatly underestimated increased costs of materials which are already well above the 1941-42 level. Tire prices, for example, are 60 per cent above the figure four years ago.

Further, parts produced from raw materials by vehicle manufacturers, entail costs which are even beyond the extent of increases in raw materials. As Mr. Romney noted, prewar quantity discounts on steel, effected largely by waiving of extra charges, are now nonexistent. Types of steel now available frequently are not of the specification best adapted to the particular manufacturing operation for which it is bought, so that higher fabricating, heat treating, and machining costs result.

In addition, some extra charges on steel are in effect now that were effect four years ago. Specifica inch and over steel bar, guarante cold shearing, carried no extra before the war. Now there is a of $15 a ton for annealing.

Mr. Romney said the public ha grossly misled by the departme advised report, and asked for th information and statistical materi which government researchers their assumptions and conclusio further requested that the dep re-examine this whole question basis of available facts and infor so the report can be revised and cized accordingly.

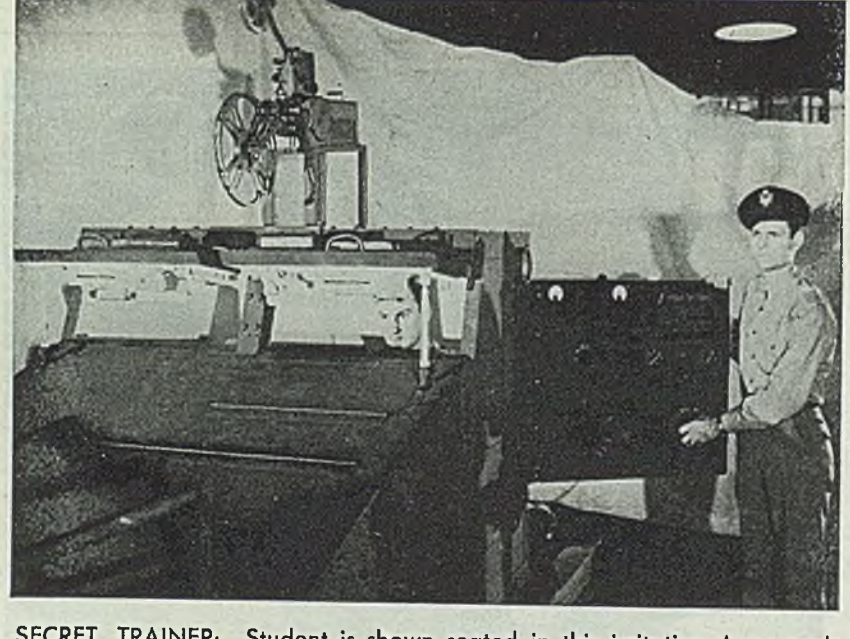
Unfortunately, appeals to log common sense these days are voices in the wilderness, nearly e by the roar of publicity and indi and breast-beating which swirl government and unions. Sadly, studied and reasonable analysis problem drowns in a torrent of em pleading, particularly when so people are on edge emotionall years of butchery, bullets and throughout the world. If ever the a time when level-headed and thinking on the part of all peop needed, it is now.

More plant construction news tained in the announcement Motors has acquired 175 acres south of Framingham, Mass., fo tion of a plant to assemble Buic and Pontiac models, with expecta breaking ground next month. T poration has been looking for a the Boston area for better than and has studied many locations choosing the selected area. Pla employ about 3000 and should be for assembly of 1947 models.

GM also will build a new b plant at Sandusky, O., presuma be operated by either the Hyatt o Departure Divisions.

The 52-acre Lincoln plant of Motor Co. in Detroit is about re start assemblies. Most final lines been installed and production of pleted cars awaits only anticip Approximately $35 million has be pended on reconversion of this and on two new assembly plants erected in Raritan township, N. J in the Los Angeles area. The L war production record in retrospe cludes 160,000 land and amph jeeps, 25,000 tank engines of the hp V-8 type, 25,000 engine nacell B-24 bombers, 6500 center wing heads for B-24s, 317,000 jeep tra case assemblies, 560,000 jeep and tary truck universal joints. The jeep was assembled by Lincoln 11 after Pearl Harbor and the last engine shipped Oct. 22, 1945.

Ford assemblies of passenger car pushing up to a rate of 2000 daily, October totals close to 6500 passe units and 8300 trucks.



SECRET TRAINER: Student is shown seated in this imitation Army tank developed by Studebaker Corp. early in 1942 for training drivers when a shortage of real tanks existed. A motion picture screen designed to show pictures of different types of terrain faced the driver. While the film was being shown a dynometer increased or decreased loads on the engine in accordance with grades shown. Students were enabled to familiarize themselves with the controls and most efficient use of power before graduating into a genuine tank. NEA photo

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ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

MEN of INDUSTRY

GEORGE T. FRASER

MARTIN S. BURG

WILLIAM C. UECKER

George T. Fraser has been appointed manager, Raxalloy Division, Crucible Steel Co. of America, New York. **L. S. McReavey**, formerly manager of that division, has resigned to manage an automobile sales agency at Midland, Mich.

—o—

Charles C. Hottmann recently resigned his position with Farrell-Cheek Steel Co., Sandusky, O., to become sales engineer in Ohio and Indiana for the Detroit Steel Casting Co., Detroit.

—o—

Milton Granquist is acting as a special representative for Hardinge Bros. Inc., Elmira, N. Y., in the Minnesota territory, with office in Minneapolis.

—o—

Harry W. Gleichert has been named director of sales for the Columbia Chemical Division, Pittsburgh Plate Glass Co., Pittsburgh. In addition, **John C. Leppart** has been appointed assistant to the operating vice president, Southern Alkali Corp., Corpus Christi, Tex., which company is owned jointly by Pittsburgh Plate Glass Co., and American Cyanamid & Chemical Corp.

—o—

William L. Burgoyne has been appointed special field engineer, Federal Products Corp., Providence, R. I. Previously he was assistant to the general manager, Wright Aeronautical Corp., Paterson, N. J.

—o—

Charles W. Stewart has been appointed vice president in charge of sales, Clark Mfg. Co., Cleveland. Mr. Stewart has served as president of the Steam Heating Equipment Manufacturers Association since 1942 and for 19 years was associated with Hoffman Specialty Co., Indianapolis.

—o—

G. V. Woody has been appointed to succeed **R. C. Newhouse** as manager, basic industries department, Allis-Chalmers Mfg. Co., Milwaukee. Mr. Newhouse, who will be retained as a consulting engineer, retires after more than 40 years with the company. Mr. Woody has been manager of the company's district office at Pittsburgh since 1934, and **J. K. Keogh** succeeds him in that position. **M. M. Tulloch** has been named sales and consulting engineer for the company in the Dutch East Indies, Malayan states, Burma and Thailand, and will open an office in Singapore next spring.

—o—

Martin S. Burg has joined Certified Core Oil & Mfg. Co., Chicago, a division of Socony-Vacuum Oil Co., as chief chemist and technical foundry adviser.

—o—

Brigadier Arthur Levesley has been appointed general manager, steel foundry and ancillary departments, Edgar Allen & Co. Ltd., Sheffield, England, succeeding the late **J. A. E. Wells.**

—o—

D. J. Fox recently was elected president, Fretz-Moon Tube Co., Butler, Pa.

—o—

Norman J. Froelich, formerly with Keystone Steel & Wire Co., Peoria, Ill., has joined the sales force of the Reynolds Wire Co., Dixon, Ill., and will be in charge of its Chicago office. During the war, Mr. Froelich served more than a year with the wire branch of the Steel Division, War Production Board, Washington. **H. Allen Sisson**, formerly with Michigan Wire Cloth Co., Detroit, also has joined the sales staff of the Reynolds company, and will be in charge of its Detroit office.

—o—

D. A. Nabb has joined the sales staff of Detroit Seamless Steel Tubes Co., Detroit, after serving four years as major in the Office of Chief of Ordnance, Washington. Prior to that he was associated with Ford Motor Co., Dearborn, Mich.

—o—

James K. Sutherland, for 32 years associated with Youngstown Sheet & Tube Co., Youngstown, and recently general manager of the Great Lakes Steel Corp. plant in Ecorse, Mich., has been named superintendent of the F Motor Co. rolling mills and open-he plant at the River Rouge plant, D born, Mich.

—o—

William C. Uecker has been n treasurer and sales manager and E **G. Merlin**, secretary and sales represe tive, Carbide Die & Mold Co., Pittsbu

—o—

J. P. Lyons, Ohio district sales re sentative since 1920, Elwell-Parker E tric Co., Cleveland, has retired to de his time to personal interests in Flo **R. F. Crawford**, long associated Mr. Lyons, will continue to repr the company in Ohio.

—o—

C. E. Riley has been appointed eral sales manager of the Carbon and Strip Division, McLouth Steel C Detroit, and will work in conjunc with **L. E. Moultane**, vice presiden charge of sales. Mr. Riley has bee the steel business for 25 years, the 14 with the McLouth organization, w recently announced its entry into stainless steel field.

—o—

Charles Schenck, engineer of deve ment, Bethlehem Steel Co., Bethleh Pa., retired Oct. 31. Mr. Schenck jo the company in 1918 as production gineer at the Bethlehem, Pa. plant w he was in charge of planning, estima cost of machinery, and piece work. remained in that position until 1934 w he was appointed engineer of deve ment, development and research dep ment, on special equipment, and sultant on manufacturing and weldin

—o—

T. A. Crawford has been appoin general manager, Timken Silent A matic Division, Timken-Detroit Axle Detroit.

—o—

Benjamin Schwartz, executive president, New York Commodities Co was re-elected president, New Y chapter of the Institute of Scrap Iron Steel Inc., at its recent annual meeti

Mr. Schwartz formerly was director general of the national institute and also was chief, Scrap Metals Section, Foreign Economic Administration, Washington. Samuel H. Bassow, Bassow Bros., Bronx, was elected chairman of the chapter's executive committee. Other officers elected include: First vice president, William Frost, P. W. Bowers Co., New York; second vice president, Charles J. Lang, Scrap Iron & Steel Corp., Brooklyn; treasurer, George Alper, Queensboro Structural Steel Co.; secretary, Albert Raphael, Bassow Bros.

—o—

George O. Boomer has been elected president, Tube Turns Inc., Louisville, Ky., succeeding Rudy E. Fritsch who resigned early in October. Mr. Fritsch will remain with the company as a consultant.

—o—

Paul C. Van Cleave has been appointed manager of rolled products sales, Colorado Fuel & Iron Corp., Denver, returning from the Army Air Corps where he served as major with the assistant chief of air training staff, Washington.

—o—

Carl J. Dinic has been appointed executive assistant to the president, American Locomotive Co., New York. Prior to joining the company in 1943, Mr. Dinic had served with the United States Steel Corp. and Eastern Gas & Fuel Associates.

—o—

Tin Mill Products Corp., Pittsburgh, announces the following new district sales representative: J. A. Wilson, J. A. Wilson Metal Products Co., New York; C. C. Abbott, Cincinnati; M. J. Dennin Jr., M. J. Dennin & Sons, Indianapolis; Harry W. Masters, Toledo, O.; and Fred A. Wade, Detroit. C. A. Wright, Industrial Metals & Products Co., Erie, Pa., has been appointed area sales representative and will direct activities of William C. Walker, Syracuse, N. Y., Stanley N. Olmstead Jr., Jamestown, N. Y., Donald M. Hester, Erie, Pa., Edward R. Jones, Rochester, N. Y., A. H. Loranger and J. C. Piel, Cleveland, Dwight Ely, Columbus, O., and Hal J. Imhoff, Shelby, O. John W. Taylor, formerly in charge of steel redistribution for the War Production Board, at Pittsburgh, has been appointed to the company general sales staff.

—o—

H. J. Crichton, former supervisor of purchases, General Motors Truck & Coach Division, Pontiac, Mich., General Motors Corp., has been transferred to the administrative staff of the division to handle special assignments. R. E. Hopps, until recently purchasing agent, succeeds Mr. Crichton. J. T. McManus, buyer, becomes purchasing agent.

—o—

C. G. Allen has been named to the research and development staff, Bryant Heater Co., Cleveland. Formerly associated with American Stove Co., St. Louis, and later with the testing laboratories, American Gas Association, Mr. Allen has served in the armed forces since 1941.

—o—

Hugh Avery has been named personnel director of Robins Conveyors Inc., Passaic, N. J. He recently was in charge of employment at the Lake Erie Engineering Corp., Buffalo.

—o—

Bert Carpenter, Birmingham, Mich., has been named sales representative for Michigan and northern Ohio for the Plan-O-Mill Corp., Hazel Park, Mich.

—o—

Peter F. McNeish has been appointed manager of accounting for the central district, Westinghouse Electric Corp., Pittsburgh. He succeeds Michael J. Simica, who recently joined the Office Methods Division, Pittsburgh, as assistant director. Dr. Russell A. Nielsen, formerly a research engineer at East Pittsburgh, Pa., heads the new Pacific coast high frequency laboratory opened recently by Westinghouse. Paul W. Kohler has been appointed manager of advertising and sales promotion for the company's Appliance Division. E. W. Isenhower is manager, southern California district, Home Radio Division, and has headquarters in Los Angeles.

—o—

Joseph N. Greene, president, Alabama Gas Co., and Alabama Natural Gas Corp., Birmingham, has been elected a director of the American Gas Association.

—o—

Robert G. Allen has been named general sales manager, Baldwin Locomotive Works, Eddystone, Pa. After serving more than two years in the armed forces, Mr. Allen joined the Baldwin organization in March, 1945, as general manager, Baldwin Southwark Division.

—o—

Edward M. Whiting has been elected president, Pheoll Mfg. Co., Chicago, succeeding the late Mason Phelps. Mr. Whiting has been vice president since 1926 and a director since 1916.

—o—

Charles F. Cushing has been appointed vice president and assistant general manager, Payne Furnace Co., Beverly Hills, Calif., a member company of Dresser Industries. Mr. Cushing leaves the post of distribution manager, Bryant Heater Co., Cleveland, another Dresser company, with whom he has been associated since 1935.

—o—

Fred J. Schmidt, formerly chief marine engineer, Pennsylvania Shipyards Inc., Beaumont, Tex., has been named chief engineer, American Steel Dredge Co., Ft. Wayne, Ind.

—o—

James Ogier Lewis, a petroleum engineer of Houston, Tex., has been named the recipient of the Anthony F. Lucas gold medal for 1946, which is awarded by the American Institute of Mining and Metallurgical Engineers. The medal will be presented at the annual meeting of

G. G. LANDIS

Who has been named vice president in charge of engineering, Lincoln Electric Co., Cleveland, noted in STEEL, Oct. 29 issue, p. 89.

C. H. MORSE III

Who recently has been elected vice president, Fairbanks, Morse & Co., Chicago, as noted in STEEL, Nov. 5 issue, p. 114.

CARL E. BARTZ

Recently named manager, Syracuse, N. Y. branch, Edgar T. Ward's Sons Co., Pittsburgh, noted in STEEL, Nov. 5 issue, p. 114.

the institute to be held in Chicago in February, 1946.

—o—

John P. Faver has been appointed assistant to the general manager and consulting engineer, Ransome Machinery Co., Dunellen, N. J. **J. E. Bushnell** has been promoted to chief engineer and **George W. Cronk** to chief draftsman.

—o—

James C. Magee has been named manager of the machinery department, Iron & Steel Products Inc., Chicago. **Charles A. Marshall** has been appointed sales engineer.

—o—

James M. Hait, Los Angeles, and **William DeBack**, San Jose, Calif., have accepted executive positions with Food Machinery Corp., San Jose, replacing **A. R. Thompson**, formerly chief engineer, and **F. L. Burrell**, who have retired. Mr. Hait becomes director of engineering and Mr. DeBack was named manager of the Anderson-Barngrover Division.

—o—

Alex Marks, formerly of the sales engineering department in Chicago, Otis Elevator Co., has been appointed general sales manager succeeding **Arthur Lundeen**, vice president and general zone manager at Chicago.

—o—

Tally W. Piper, who has been associated with Stone & Webster Engineering Corp., New York, for 25 years, has resigned as personnel and labor relations manager to establish the Unistrut Service Co. of the Southeast with offices in Birmingham and Atlanta.

—o—

Dr. Edward U. Condon has been nominated to be director of the National Bureau of Standards, to succeed **Dr. Lyman J. Briggs**. Dr. Condon has been serving as an associate director of the research laboratory, Westinghouse Electric Corp., Pittsburgh.

J. A. DOYLE JR.

Who recently became president, Wm. G. Wetherall Inc., Baltimore, noted in STEEL, Oct. 29 issue, p. 97.

—o—

Lester H. Pillion has been appointed eastern sales manager for the Precision Castings Co. Inc., Fayetteville N. Y., and he will have headquarters in New York. **A. G. Bryan** continues as metropolitan area representative. **Ross W. Castle** has been appointed western sales manager with offices at the Cleveland plant. **W. A. Maher** and **W. C. Berry**, with headquarters in Detroit, continue to serve as Michigan representatives. **H. L. Hess** continues to represent the company in eastern Pennsylvania and western New Jersey. **J. J. Punke** has been appointed factories manager and chief engineer; **Albert Lintel** will assist him at the Syracuse and Fayetteville, N. Y., plants as factory manager. **J. R. Millspaugh** has been appointed gene manager of the Cleveland plant **A. D. Weigolt**, factory manager. St ley Frost has been appointed presid Kalamazoo Division, and **C. M. Hy** vice president and general manager.

—o—

Marcus M. Chapman has been pointed manager of sales, Sheet Divis Carnegie-Illinois Steel Corp., Pittsbu succeeding **Howard V. Clark**, rece resigned. Mr. Chapman first joined United States Steel Corp. in 1919 w he served in the open hearth departm of the American Sheet & Tin Plate

—o—

T. H. McGraw Jr., has discontinued services as general manager with B burn Alloy Steel Corp., Braeburn, From 1926 until 1944 when the c pany was sold to Continental Indus Inc., New York, Mr. McGraw had se as president and chairman of the bo

—o—

Dr. Charles H. Herty Jr., assistan vice president, Bethlehem Steel Bethlehem, Pa., was elected presiden the American Society for Metals at annual meeting of the society held 2 in Cleveland. He succeeds Dr. **R. Van Horn**, assistant manager, Cl land Research Division, Aluminum of America. Other officers elected Vice president, **A. L. Boegehold**, hea the metallurgy department, Rese Laboratories Division, General Mo Corp., Detroit; treasurer, **Dr. H. K. W** manager of research and developm Jones & Laughlin Steel Corp., P burgh; **John Chipman**, professor of allurgy, Massachusetts Institute of T nology, Cambridge, Mass., and **W. Jominy**, chief metallurgist, Dodge cago plant, Chrysler Corp., Deb trustees.

OBITUARIES . . .

William E. Kane, 79, president and founder, Kane & Roach Inc., Syracuse, N. Y., died recently in that city. Mr. Kane was widely known as the inventor of numerous devices, one of which was a cold roll forming machine for the steel industry.

—o—

Clyde A. Walb, 67, president, American Steel Dredge Co., Ft. Wayne, Ind., American Steel Supply Corp. and General Dredging Co. Inc., died Oct. 30.

—o—

George F. Dort, 60, engineer in the Standards Division, White Motor Co., Cleveland, died Oct. 30 while on a business trip to Detroit.

—o—

Elbert Rodgers, president, Elbert Rodgers Coal Corp., Buffalo, and at one time traffic manager and later purchasing agent, Wickwire Spencer Steel Co., New York, died Oct. 28 in Buffalo.

—o—

Andrew Allen, owner, A. Allen & Son, Harrison, N. J., died Nov. 3 at his home in Jersey City, N. J.

—o—

Frank L. Stearns, 85, retired manufacturer of irrigation machinery, died recently in Los Angeles.

—o—

Frank A. Moeschl, 72, a former executive of the Newport Rolling Mill Co., Newport, Ky., died Oct. 28.

—o—

John Gibb, 41, an electrical engineer for Westinghouse Electric Corp. at Newark, N. J., died Nov. 2 at his home in Elizabeth, N. J.

—o—

Grant Fersen Davis, 55, an executive of the Standard Steel Corp., Los Angeles, died recently.

—o—

Jesse R. Lovejoy, 82, a director of General Electric Co., Schenectady,N. Y., since 1922 and an honorary vice p dent for the past 16 years, died Oct in that city.

—o—

Henry Zschech, president in 1926, kins Pioneer Club, E. C. Atkins & Indianapolis, died recently. He been employed by that company fo years, retiring in 1943 due to fa health.

—o—

Pierre A. Cady, laboratory mana of the Passaic, N. J., branch, Rub Manufacturing Division, Raybestos-M hattan Inc., died recently.

—o—

W. C. Williams Jr., 61, vice presid in charge of Accessories Division, G eral Motors Corp., Detroit, died in t city Nov. 2.

—o—

Harley S. Griner, 46, manager of research department, J. D. Adams M Co., Indianapolis, died Nov. 4 as a sult of injuries sustained in an accide

Workers Passing Up Thousands of Job Openings

Compensation claims increase in California despite 28,000 unfilled positions. Employers more exacting in their hiring

SAN FRANCISCO

NEARLY three months after V-J Day it is estimated demand for workers exceeds the manpower supply by at least 75,000.

Of this number nearly 28,000 unfilled jobs are in the files of the United States Employment Service. The remainder can only be estimated because most of it is scattered among various union hiring halls and private employment agencies.

Charles F. B. Roeth, acting state director, USES for northern California, states although job openings are more numerous than last month by a few hundred, increases in work opportunities which would reflect an active conversion of production of civilian goods and services actually have been slight. Gains have been largely confined to government installations and to shipbuilding where the approaching contract completion dates are forcing replacement of many separated workers, particularly those in the skilled trades. Unfilled jobs on file in USES offices have decreased in number during the past month in construction, transportation and service, but openings in wholesale and retail trade have increased slightly.

Openings on file reflect more exacting specifications on the part of employers and it is evident that the number of jobs with wage rates comparable to those paid by war industries has decreased since the end of the war.

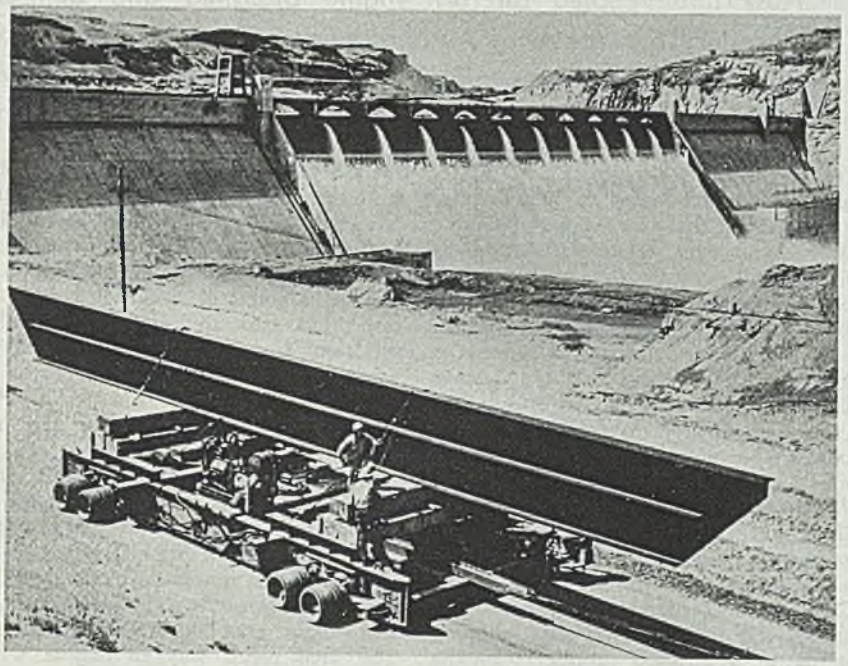
Demand Rises for Skilled Workers

Of the approximate 28,000 unfilled jobs on file in Mr. Roeth's office, more than 1900 are for professional and managerial workers, more than 8400 in clerical and sales occupations and about 3100 in the service occupations. The need for skilled workers has increased steadily to a current total of nearly 5100. Unfilled jobs for semiskilled workers are declining and now stand at about 1700. Unskilled worker openings also have been reduced to about 8000.

Despite the fact that there are jobs going begging, the number of claims for unemployment compensation has been increasing steadily. Newly unemployed workers in the San Francisco area have been filing initial claims at the rate of three to four thousand a week since the middle of August. The turnover in the newly unemployed group remains high, about a third failing to return to certify completion of the first week of unemployment. The number of persons unemployed and drawing insurance has, however, gained steadily, averaging nearly 7400 a week in September, an increase of 4200 over August. By mid-October the number had reached approximately 15,000 a week.

Unemployment insurance payments in the area are expected to increase over the next few months, but benefit payments at present are below prewar levels while the number of persons with earnings enabling them to claim benefits when unemployed has increased greatly during the war years.

Although sharp reductions were recorded in the iron and steel and machinery industries in the few weeks after end of the war, the contraction in the shipbuilding industry was the largest cause of the decline. Wage earners in the San Francisco area's shipbuilding yards declined to 50,500 in September compared with 79,000 in August and with 185,200 in the peak month of June, 1943. Further declines are indicated for October. These sharp reductions have been in private yards, as the employment in government ship repair bases has been reduced only moderately.



GRAND COULEE DREDGE: Accumulations of silt and debris at the bottom of the Grand Coulee spillway will be removed by specially constructed dredging machinery. The 43-ton steel beam, shown here on a 16-wheel trailer, is a part of the special dredge. International News photo

Los Angeles Activity Higher Than in 1944

LOS ANGELES

General business activity in Southern California is about 7 per cent ahead of last year even though war contract cancellations have affected proportionately more industries than any other industrial region in the country.

This finding, announced last week by the industrial department of the Chamber of Commerce, is interpreted by business and government officials that reconversion is moving ahead.

Purchasing agents reported to the Chamber that rising demand for goods by discharged military service personnel is offsetting decreases in sales to former war workers.

In many lines, civilian business now exceeds military cancellations and the trend is growing.

Midwest Companies Plan West Coast Branches

LOS ANGELES

Ball Bros. Co., Muncie, Ind., manufacturer of glass containers, will build a $3,500,000 factory at El Monte, Calif.

Electric Household Utilities Co., Chicago, plans a $1 million plant in the same area.

The Ball company plans to employ about 300 persons at the beginning of operations. Their plant at Valley Boulevard and Arden Drive will start with a 100,000 square-foot unit.

Electric Household Utilities Co., maker of washing machines and other appliances, has purchased a 10-acre site with 600-foot frontage on Valley Boulevard. The plant will employ 200 to 250 persons.

WING TIPS

New liquid-cooled aircraft engine designed and built by Chrysler Corp. for Army Air Forces has 2500 horsepower, more powerful than any engine of similar displacement. Drives specially adapted testing plane at more than 500 miles an hour

A NEW and hitherto secret 2500-horsepower liquid-cooled airplane engine, more powerful than any engine of similar displacement, yet relatively simple to produce and economical in operation has been designed and built for the Army Air Forces by Chrysler Corp., Detroit.

A 16-cylinder inverted-V type, the engine in a specially adapted testing plane has already developed speeds approaching 500 mph. Weighing but 2430 pounds, the engine is 10 feet 5 inches long and less than 3 feet in diameter. The small frontal area allows good visibility and affords streamlining which greatly reduces drag in flight.

The first engine was delivered to the Air Technical Service Command in January, 56 months from the designing boards to a finished product. In the period from May, 1940, when design studies began, a total of 312 designers, engineers and technicians conceived and produced more than 1100 different parts for the engine. Each part was individually and collectively subjected to every conceivable test known to both the automotive and aircraft engineering world.

In that 56-month period more than 25,000 hours of testing were devoted to the engine and its parts and assemblies, and more than 1000 engineering reports comprising 15 million words were written about it by engineers and testers. Included in the program was the construction of a propeller test house and an aircraft engine test house adjoining the Chrysler engineering division in Detroit. Inside the buildings is research and test equipment worth more than $1,500,000.

Flight tests up to 30,000 feet have been conducted at Evansville, Ind., by test pilots associated with the Republic Aviation Corp. Chrysler technicians worked with Republic engineers to redesign and rebuild a special P-47 Thunderbolt fighter ship for the new engine.

Engineers planned the engine from its inception for mass production, applying the technique of auto engine design to the new aricraft power plant. Each part, as it was developed, was reviewed with an eye for the problems that might arise during its production. The final result was an engine which could be produced easily, quickly, and with maximum economy in production, operation and servicing.

Major features of the engine are:

Small frontal area, permitting better visibility for the pilot and allowing submerged installations in the wing or fuselage and more compact cowling installation, thus reducing drag. In bomber types of planes slender engines can be submerged in wings, practically eliminating drag.

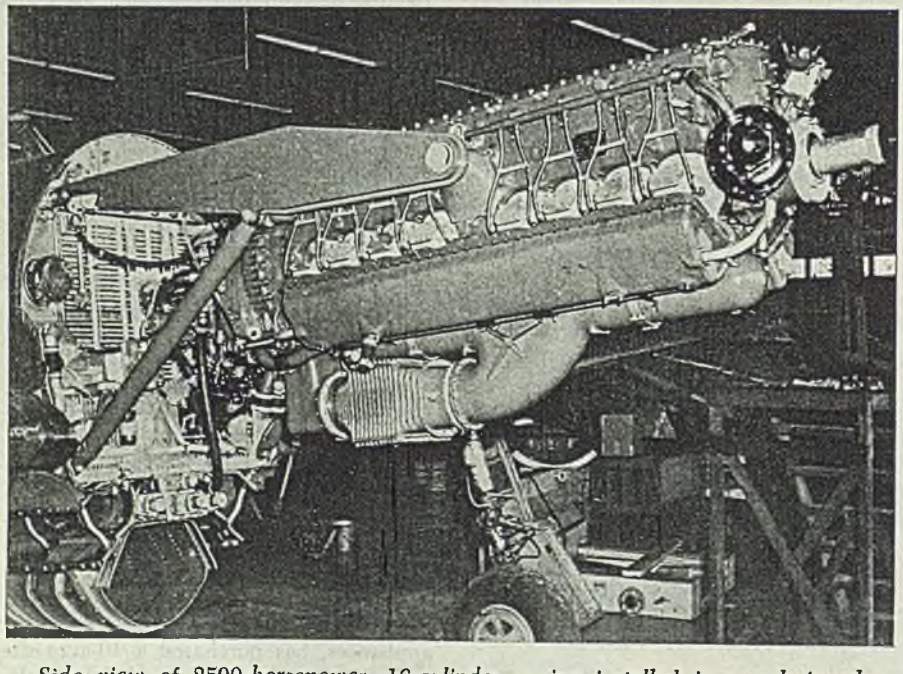
Use of a two-piece crankshaft, bolted together at the reduction gear pinion, reducing vibration and simplifying production, assembly and servicing.

Use of two valves to a cylinder, reducing weight and allowing better cylinder breathing and strong cylinder he

A one-piece crankcase, simply chined and easily installed.

A single large ring nut and washe fasten the cylinder and barrel to crankcase.

Accessories and fittings placed in cessible places to simplify produc and servicing. The valve gear, for ample, is reached in the new en simply by removing a cam box c



Side view of 2500-horsepower, 16-cylinder engine installed in a redesigned Republic P-47 fighter plane. The narrow diameter of the engine provides good visibility for pilot and reduces drag

Kaiser Plans Experimenta Work on New Hiller-Cop

Kaiser Cargo Inc. announced week that further experimental and velopment work on the Hiller-Co invented by Stanley Hiller Jr., Berk Calif., will be carried on by the pany's engineering forces at its F wings Division aircraft plant in Br Pa.

Mr. Hiller, because of his interes Hiller Industries and other business terprises located in the Bay area, ferred not to go to Bristol to per further services for Kaiser Cargo and is therefore no longer conne with the Kaiser interests in any way will remain in the San Francisco area to direct his own organization, ed Helicopters Inc., which will i pendently conduct development and duction of rotary wing aircraft. Ne Mr. Kaiser nor Kaiser Cargo Inc. any financial or other interest in this company. Kaiser Cargo Inc. retains rights, under Mr. Hiller's original ents on the Hiller-Copter, as well helicopter inventions made by Mr. H while performing services for that c pany.

The Hiller-Copter employs a pai co-axial, contra-rotating wings, and m its initial flight on May 14, 1944. Hiller-Copter's two rotors, operating a common axis, eliminate the neces for the tail rotor employed by con tional single-rotor helicopters to coun act torque, thereby increasing the amo of power available for lift and forw propulsion.

Five Overseas Surplus Airplanes Are Sold

Five overseas surplus airplanes w sold and another leased during Sept ber, it has been announced by Thom B. McCabe, Foreign Liquidation Co missioner.

Sales of the planes and spare pa realized a sum of $71,357 during month, bringing the cumulative to tor sales abroad to $536,440, in t months of operation under FLC.

In addition, FLC Aircraft Divis sold five planes from RFC stocks for port, total sale price being $151,9 This sum brought total sales made RFC to $4,752,679, including all sa

Philco "Thirty" Industrial Truck Storage Battery gives 30% longer life and is identified by its distinctive red connectors.

FOR 50 YEARS A LEADER IN INDUSTRIAL STORAGE BATTERY DEVELOPMENT

Tune in The Radio Hall of Fame, with Paul Whiteman and His Orchestra, Sundays, 6 P. M., EST; The Breakfast Club with Don McNeill, 9:45 A. M., EST, Monday through Friday—ABC (Blue) Network (Coast to Coast).

MODERN ELECTRIC INDUSTRIAL TRUCKS POWERED BY COST-SAVING PHILCO "THIRTY" STORAGE BATTERIES

Now you can get the kind of industrial trucks war experience proved the safest, most flexible and maintenance-free — ELECTRIC TRUCKS! And you can power your trucks with the greatest materials handling development since the fork-lift truck, itself—PHILCO "THIRTY", the Storage Battery with 30% longer life! Plan now for the big demands peace-time production will place on your materials handling equipment. Philco "Thirty" will give your trucks top capacity, *plus* savings in maintenance, depreciation and replacements. Write today for new catalogs giving specifications.

PHILCO CORPORATION • STORAGE BATTERY DIVISION • TRENTON 7, NEW JERSEY

PHILCO *Famous for Quality the World Over*

made by the Aircraft Division when it was under FEA prior to its transfer to FLC.

The FLC sales were as follows:

Two UC-64 (Noorduym Norseman) aircraft to the government of Iceland for $22,240. They originally cost $71,-102.

Three trainer planes, located in Calcutta, to the China National Aviation Corp. for use in the training of pilots. They cost $46,535 originally, and were sold for $8475.

One plane, a C-53 transport, leased to the Danish airlines at an annual rental of $8000. Outstanding leases now total $24,000.

Air Maintenance Center Planned by Lockheed Corp.

Plans for construction of hangars and facilities to make Lockheed Aircraft Corp.'s new Customers' Service Division the airline maintenance center of the West Coast have been announced. This service division, employing approximately 3000 people, will be headed by Reagan C. Stunkel, general service manager of Lockheed, under supervision of Carl B. Squier, vice president in charge of sales and service.

German Aircraft Control Equipment Patents Listed

Alien Property Custodian James E. Markham last week invited manufacturers of instruments and control equipment for aircraft to examine a group of 43 United States patents and patent applications which the alien property custodian vested from Askania-Werke, A. G., German manufacturer, soon after the outbreak of the war.

All these patents and patent applications are available for licensing to American citizens on a royalty-free non-exclusive basis for the remaining life of the patents, Mr. Markham said. An administrative fee of $15 is charged for each patent licensed.

The inventions in this group, Mr. Markham pointed out, include a variety of instruments and gyroscopic mechanisms for control of and navigational aids for airplanes. One device is for automatically controlling the fore and aft inclination of aircraft and, the custodian said, a number of the patents deal with steering mechanisms and apparatus. Various stabilizing, course indicating and remote control devices are also included. Gyro-magnetic compasses and compass follow-ups are the subject of other patents.

A list of these patents and applications may be obtained from the Patent Use & Development Section, Office of Alien Property Custodian, Washington 25, D. C.

Rohr Stops Reconversion, Continues Subcontracts

Plans of Rohr Aircraft Corp., Chula Vista, Calif., to convert to manufacture of such consumer goods as refrigerators and washing machines have been deferred in favor of aircraft subcontracts awarded recently.

Orders have been received from the Douglas and Lockheed factories to supply power plant installations for the C which is being converted from militar civilian use and the Constellation, tr port plane.

"There is enough work at our plan keep the present force of 1000 busy many months," said Fred Rohr, presid "We did not expect to receive so m commercial aircraft contracts, and have had to assign all our available ing and engineering facilities to work."

New Aircraft Lacquer Improves Plane Safety

A new aircraft lacquer that as improved safety in airplane operation reducing fire hazards in lacquered faces has been announced by Mons Chemical Co., St. Louis.

Skylac, the new Monsanto finish, developed for use on fabric-cov exterior control and plane surfaces on interior decorative areas. It comb increased weather resistance, tautening effect and ease of app tion with high fire resistance.

When exposed to flame, Skylac faced fabric will not support com tion, while under the same condi conventional materials flare up i quick flame. Because of its high so fewer coats are required than with usual cold spray finishes. Since Sk is designed to spray at room temp ture, no special equipment is neces

As much as 1000 square feet of fa covered area on large transport pl will be finished with the new mate These include aileron, rudders and vators, where metal is not suitable.

All American Aircraft Introduces New All Metal Personal Monopla

A NEWCOMER in the light plane field is the Ensign, recently placed in production by All American Aircraft Inc., Long Beach, Calif.

This all metal, low-wing monoplane is powered with an 85-horsepower Continental engine which gives it top speed in excess of 125 miles per hour and a practical cruising speed of 112 miles per hour. With a useful load of 550 pounds and a cruising range of 500 miles plus, the Ensign affords the private flyer air-travel speed and comfort at motor car operating costs. The plane climbs skyward at 700 feet per minute and performs well at ceilings to 13,500 feet. The wing span is 33 feet and fuselage overall length, 22 feet. Wings and tail surfaces of the new plane are of cantilever construction.

Features of the Ensign include tricycle landing gear, differential hydraulic brakes, a full-view moulded plexiglass bubble enclosure, free of obstructions and a styled interior on a par with that of a high priced motor car.

The All American candidate for post-war business and sports flying honors sells for $3000, flyaway Long Beach.

Production of 5000 in the next ye anticipated by company officials.

Prevent Failure

OF CRITICAL PARTS

with Surface-Hardened STAINLESS

No chances can be taken that critical parts will fail in life-saving equipment like this aircraft crash truck. When in operation the nozzle must move freely and easily so that the operator can "sweep" the flaming gasoline away from the trapped flyers with the high-pressure water stream.

Even under the terrific force developed by the high-velocity jet, the bearings in the swivel joints of the nozzle must not bind or seize. And of course there must be no rust or corrosion to impede the smooth action of these bearings.

That is why Samuel Eastman Company installs bearings of Surface-Hardened Stainless Steel in the swivel joints of the nozzle.

With the new Surface-Hardening Process (Malcomizing), it is now possible to take advantage of the inherent strength and corrosion-resistance of stainless steel, and at the same time to get wear-resistant surfaces as hard as 95 Rockwell 15N (73 Rc).

Wherever remarkable ability to stand up under abrasive wear, combined with resistance to heat, corrosion, and oxidation will prevent failure of critical parts, you should consider the Stainless Surface-Hardening Process.

For More Information

If you want to know more about the advantages of this new process and how you can use it, write for the technical bulletin. If you wish, one of our metallurgical engineers will discuss it with you.

JLMCo CS-L1

STAINLESS SURFACE HARDENING CO.

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SUBSIDIARY OF INDUSTRIAL STEELS, INC.

America's Largest Warehouse for Stainless Sheets, Bars, Tubings, Wire, Valves, Fittings, Electrodes and Hardware

Fruehauf Firm To Build New Trailer Plant

World's largest truck-trailer assembly plant to be located near Cleveland. Mass production methods to be used

GROWTH of the trailer method of hauling has prompted the Fruehauf Trailer Co., Detroit, to increase its production facilities by planning to construct the world's largest truck-trailer plant at Avon Lake, O., near Cleveland.

The new one-floor plant, on which construction will start immediately, will be 2250 feet long and 400 feet wide, and will permit application of the automobile industry's mass assembly techniques to production of truck-trailers. The new plant, including buildings and equipment, will cost $4½ million, and will employ 2500 people when in full operation. Although the Avon Lake plant will be the company's largest, the firm's headquarters will remain at Detroit, at least for the present.

The company developed from a blacksmithing business of the Fruehauf family. Active today in management of the truck-trailer company are three brothers: H. C. Fruehauf, president; R. A. Fruehauf, executive vice president; and H. R. Fruehauf, first vice president.

The new assembly plant will not displace present facilities but will augment them. It will be devoted to quantity production of standard model truck-trailers.

Use of stainless steel in Fruehauf's truck-trailer manufacturing is expected to be resumed soon.

The Avon Lake site was chosen because of the high grade of labor in the community, favorable transportation facilities, and nearness to materials. Shipment of new trailers can be made over important nearby highways, and materials and components can be transported to the plant by truck and railroad. Seventy per cent of the materials used by Fruehauf come from within 100 miles of the new plant.

Trackless Coal Mine Opened By United States Steel

Opening its first coal mine since the end of the war, United States Coal & Coke Co., subsidiary of United States Steel Corp., has begun taking bituminous coal from a mine which is expected to yield 1200 tons daily. The new mine, near Gary, W. Va., is completely mechanized, coal being transported from the seam to the portal by conveyor belt.

NEW IDEA OFFICIALS: Aviation Corp. has purchased the controll interest in New Idea Inc., manufacturers of farm machinery (STEEL, N 5, p. 123). Left to right, sitting: Irving Babcock, president of Av Henry Synck, former president of New Idea and now a director; Willi F. Wise, new president of New Idea. Standing: T. H. Oppenheim, J. Oppenheim and J. A. Oppenheim, all vice presidents of New Ide

BRIEFS . . . .

Paragraph mentions of developments of interest and si cance within the metalworking industry

Farnsworth Television & Radio Corp., Ft. Wayne, Ind., has purchased a plant of the Hosdreg Co., Huntington, Ind.

—o—

Ellinwood Industries, Los Angeles, has purchased National Machine Products and California Motor Cultivator Co. Ltd., Los Angeles, and will manufacture garden tractors, farm implements and adding machines.

—o—

SKF Industries Inc., Philadelphia, has published a 270-page book entitled "Ball and Roller Bearing Engineering" to serve as a fundamental text on all phases of bearing applications to industry.

—o—

Caine Steel Co., Los Angeles, will begin construction of its new office building soon, Marshall Wais, president, has announced.

—o—

Carboloy Co. Inc., Detroit, has appointed Sligo Iron Store Co., St. Louis, distributor for the southern Illinois and eastern Missouri area. Distributor for southwestern Michigan and northcentral Indiana is South Bend Supply Co., South Bend, Ind.

—o—

American Chain & Cable Co., Bridgeport, Conn., has purchased the Certified Gauge & Instrument Corp., Long City, N. Y., and will continue m ture of the helicoid movement p gauge under the name American & Cable's Helicoid Gauge Divisio

—o—

Steel Materials Corp., Detroit, quired control of Phillips Pump Co., Cincinnati, and will enlarge th lips plant where large-scale pro of household utensils and a ne pump is planned.

—o—

General Electric Co., Schen N. Y., has completed the first railroad-mounted unit substations U. S. S. R., at its Pittsfield, Mass. Completely mobile, these units wi the electrical needs of wartorn until permament substations can b

—o—

Toolcraft Products Co., Dayto has begun construction of a $ plant addition.

—o—

Reconstruction Finance Corp opened a branch sales office at Third St., Columbus, O.

—o—

Layman Welding Supply Co., Rapids, Mich., welding supply has been opened by R. Dudley L

former district manager for Lincoln Electric Co., Cleveland.

—o—

Charles T. Brandt Inc., Baltimore, is continuing work in precision sheet and plate products, but also plans to produce a steel dowel for use in construction of concrete roads and airport runways, a line of road construction devices and is beginning the manufacture of standard truck bodies.

—o—

Flagship Engine Co., Dundalk, Md., plans production soon of gasoline engines for use in cruisers of the Owens Yacht Co., parent company.

—o—

Boston Iron & Metal Co., Baltimore, has changed its name to Boston Metals Co.

—o—

Liquid Carbonic Corp., Chicago, is erecting a factory in Morrison, Ill.

—o—

Locomotive Development Committee, Bituminous Coal Research Inc., Baltimore, is conducting a research project at Johns Hopkins University concerned with the method of driving gas turbines with pulverized coal.

—o—

Gar Wood Industries Inc., Detroit, has purchased Buckeye Traction Ditcher Co., Findlay, O., and will expand its operations.

—o—

Dictaphone Corp., Baltimore, has been organized to manufacture an electronic dictating machine, to be on the market soon.

—o—

Crosley Motors Inc., Cincinnati, has purchased a plant in Marion, Ind., for production of the Crosley automobile.

—o—

Locke Insulator Corp., Baltimore, subsidiary of General Electric Co., is completing an extended program of plant improvement.

—o—

Kramer Motors Inc., Los Angeles, has changed its name to Gladden Products Corp. The same manufacturing and sales programs will be carried on under the new name.

—o—

Keystone Co., Tenafly, N. J., chemicals, has begun an expansion which will include addition of another floor to its present building and construction of a building on recently-acquired adjoining property.

—o—

Briggs Clarifier Co., Bethesda, Md., has completed construction of new office and laboratories.

Cincinnati Lathe & Tool Reorganized By New Management

Cincinnati Lathe & Tool Co., Cincinnati, has been incorporated with authorized capital of $100,000, and has acquired the land, buildings, machinery, designs, inventory, unfilled orders, and trade name of Cincinnati Lathe & Tool Co., Oakley, O., which discontinued manufacturing operations because of the retirement of its president.

The new company is a subsidiary of Cincinnati Milling Machine Co., Cincinnati, but will be operated independently of the parent company. Manufacture of "Cintilathes" will be continued under the new management which includes: Millard Romaine, president; and E. W. Mueller, secretary-treasurer.

Youngstown Sheet & Tube Reports Drop in Net Profit

A decline in net profit in the third quarter of this year has been reported by Youngstown Sheet & Tube Co., Youngstown. Net profit that quarter was $1,697,943, compared with $2,190,260 in the second quarter of 1945 and $1,818,768 for the third quarter of 1944.

Net profit for the first nine months of 1945 was $5,253,154 against $5,847,615 for the same period last year.

The decline in third quarter net profit is a result principally of a drop in net sales and revenue and an increase in provision for depletion of minerals, depreciation of plants and equipment and amortization of emergency facilities.

College Training Program Devised for Hagan Workers

To offset the lack of young chemists and engineers caused by the war, Hagan Corp., Pittsburgh, and its subsidiaries have announced a plan to back employees in getting college educations in night school. The plan, based on the idea of upgrading the employees when their courses are successfully completed, will be available to any member of the companies who may take either undergraduate or graduate work in a field relating to the technical or commercial activities of the companies. Complete payment for the education will be made in two instalments, the first upon the student's registration, and the second upon his graduation if he remains in the employ of the Hagan Corp.

National Steel's Net Profit Declines in Third Quarter

Net profit of National Steel Corp., Pittsburgh, for the third quarter of 1945 declined 41 per cent from second quarter. Third quarter net profit was $2,027,502 compared with $3,453,183 in second quarter. Net profit for the third quarter of 1944 was $2,667,515.

The corporation's net profit for the first nine months of 1945 was $8,910,673 against $8,080,974 for the corresponding period of 1944.

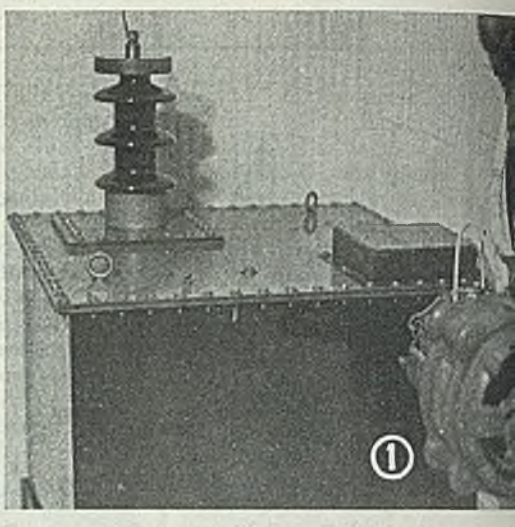
Bethlehem Forms Operating Subsidiary on West Coast

Bethlehem Steel Co., Bethlehem, Pa., has set up a new wholly-owned subsidiary, the Bethlehem Pacific Coast Steel Corp., to operate its Pacific Coast properties.

W. H. Fuller, formerly vice president of Bethlehem's Pacific Coast Steel Division, will be president of the new corporation which will operate steel plants, mill depots, and fabricating shops at Seattle; South San Francisco, Los Angeles, and Alameda, Calif.; and Portland, Oreg. General offices of the company will be in San Francisco.

MODELS AID SALES: Miniature scale models of Mercury industrial trucks, tractors and trailers are shown loading and unloading a freight car, to demonstrate their efficiency to prospective buyers

electrostatic spraying of Porcelain Enamel



By JAMES B. WILLIS
Pemco Corp.
Baltimore

Appreciable savings result in material consumed and uniform coated product is produced with minimum loss from overspra Process valuable in spraying flat surfaces with simple flang or symmetrical shapes—especially where operation is highly petitive. No special preparation of enamel required but acc ate control of its physical properties is essential. Number a location of guns for most efficient operation involves some e perimentation on each installation. Mr. Willis points out in h report, also presented to American Ceramic Society

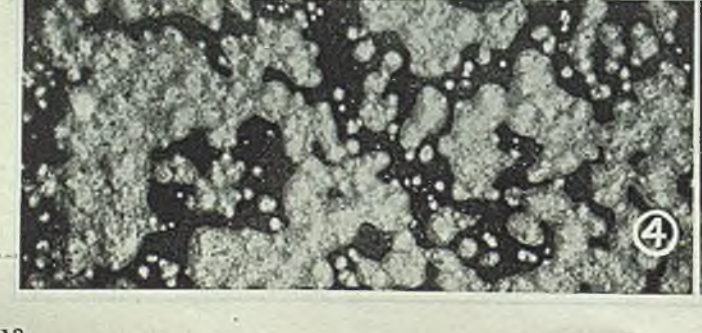
ONE OF the more serious problems which has confronted the enameler for many years has been the problem of overspray. Experience has shown that even in the best run plants as much as 50 per cent and sometimes even greater amounts of enamel put through a spray gun never reach the surface of the ware. While it is true that a large portion of this material remains in the spray booth and can be reclaimed, it represents a considerable economic loss since not only material but the time and labor required to prepare the milled enamel are involved.

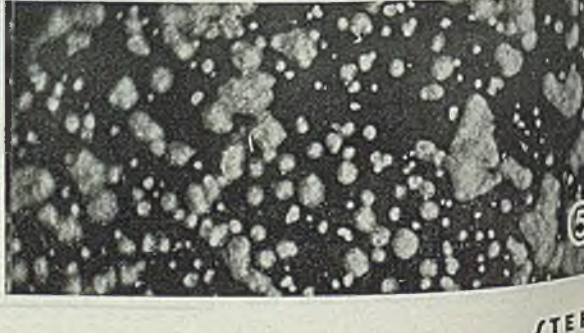
Furthermore, it is usually undesirable to use the reclaim for finish-coat application. The matter of salvage is often difficult since it is hard to prevent contamination, especially when the material remains in an open spray booth. Much time and money have been spent in the development of spraying equipment and training personnel in the spraying technique. Special types of booths to minimize the contamination and facilitate the reclaiming of the overspray have been constructed. The best water-washed spray booth on the market, however, will not prevent contamination of reclaimed material with banana peels, apple cores, an occasional plug of tobacco, and other miscellaneous items which have a strange habit of finding their way into the reclaim enamel.

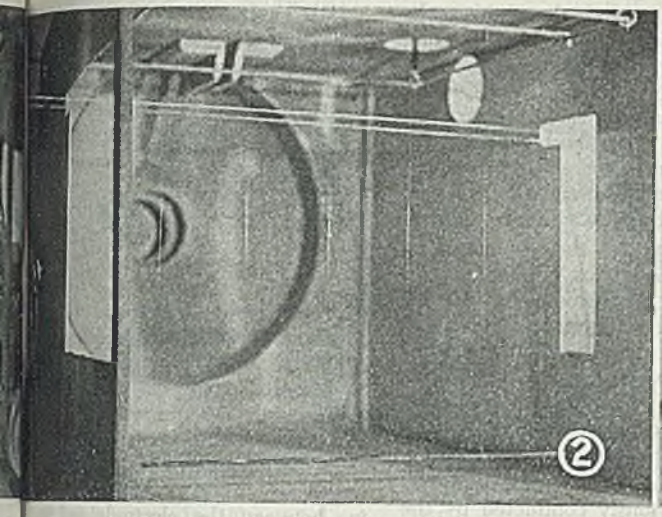
A number of years ago, the Harper J. Ransburg Co. of Indianapolis was faced with a similar problem relating to the application of paints and lacquers. Organics cannot be salvaged as are enamels, and any material which does not find its way to the surface of the ware may be counted as lost as well as difficult to remove from the spray booths and equipment. Because of problems, the Ransburg Co. conc the idea of applying the princip electronics to the problem and ach a major success.

Considerable publicity has been the electrostatic spraying process, e ally during the war years when made possible the production of su articles from the standpoint of unifo of coating together with the elimi of the loss of coating materials, ma which were critical.

There has been little conside given to electrostatic spraying of







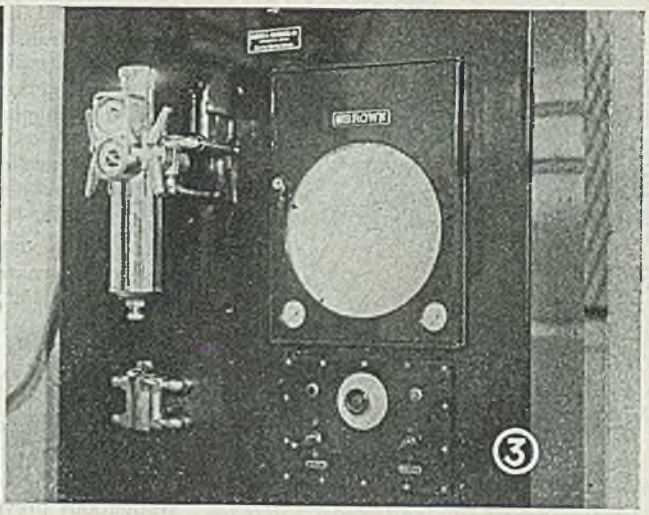


Fig. 1—High voltage direct current for charging the spray is obtained from this power pack

Fig. 2—Spray booth showing wires and rods in the electrode system

Fig. 3—Pressure control panel

...ain enamel. Experiments were car-...d on in an enamel plant, but no ...sion was made as to whether the ...ess was applicable to the porcelain ...el industry. Equipment was re-...y procured, and an investigation ...begun to determine whether or not ...electrostatic spraying process could ...pplied to porcelain enameling.

...The process consists of the charging ...the spray particles in an electric field ...the attraction of these particles to ...object to be coated, a process not ...similar, theoretically, from electro-...ing except that in the latter case ...metallic particles are suspended in ...water medium, whereas with the ..., the spray particles are suspended ...air.

...object to be sprayed is grounded ...is surrounded by an electrical field ...such a nature as to impart a negative ...ge to the atomized particles entering ...field. The particles so charged mi-...toward the object which bears a ...itive charge. Such a field is provided ...a specially designed rectifier and ...former which produces a very high ...ge (Fig. 1). Power is supplied ...the power pack in the form of a ...r, single-phase, 60-cycle current. ...secondary voltage reaches a maxi-...of 100,000 v, single-phase, half-..., 60 cycles, with a current rating ...ceeding 10 milliamperes.

The electrical field is produced by an electrode system composed of a series of fine copper wires, suspended parallel to the surface to be sprayed (Fig. 2); if the pieces are being sprayed in a horizontal position, the electrode system will be suspended horizontally. It is essential that the electrode system conform in contour to the object being sprayed. Exception may be taken to this rule with cylindrical or similarly shaped objects which can be rotated while passing through the field.

The electrode wires are spaced in relation to one another and to the grounded object so as to produce the proper intensity and direction of impulse in the field established. Generally speaking, a spacing of 6 to 8 in. between electrode wires and 10 to 12 in. between the electrode and the piece has been most efficient. Since the force of the field is proportional to the distance between electrode and ground, an increase in the distance rapidly decreases the force of the field, but the distance must be adequate to obviate the possibility of a static spark between electrode and ground, nullifying the effect of the field entirely.

The force of the field is also proportional to the difference in surface area of the electrode wires as compared with the area of the object being sprayed. The aggregate area of these wires must be very small in comparison with the area of the article opposite the electrode. If this principle is carried to the extreme, however, a noticeable decline in efficiency is noted. A No. 30 copper wire has been found most effective for this purpose and is recommended for all installations.

For efficiency of operation, the ware is usually suspended on a conveyor line which is grounded to provide a negative pole for the system. The conveyor used in the present investigation was equipped with a variable-speed motor and a variable-speed transmission providing any desired cable speed from 2½ to 35 fpm.

The spray gun used was a standard make of air-operated automatic gun. A variety of tips, needles, and atomizing caps was tried to determine the most satisfactory combination of gun fittings for the process.

The enamel used in the spraying operation was contained in an ordinary 2-gal pressure tank. A gallon bucket containing the enamel was placed in the tank to avoid the necessity of washing the entire pressure tank after each operation.

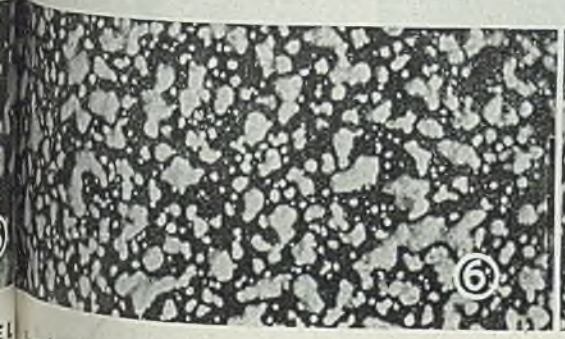
Air was supplied for the fluid pressure, the atomizing pressure, and for the

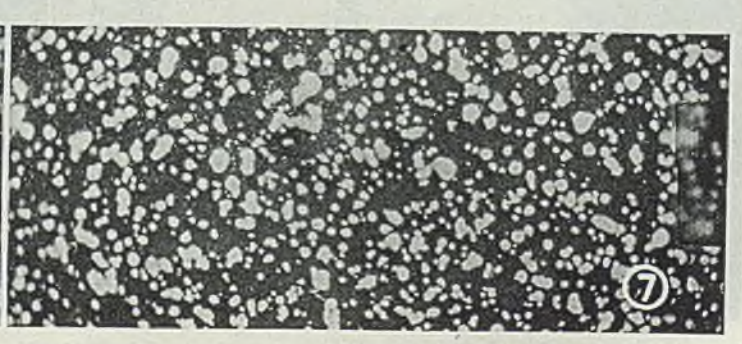
Fig. 4—Atomization classification No. 1; poor degree and uniformity of atomization. 20X

Fig. 5—Atomization classification No. 2; slight degree of atomization. 20X

Fig. 6—Atomization classification No. 3; normal atomization. 20X

Fig. 7—Atomization classification No. 4; over atomization. 20X





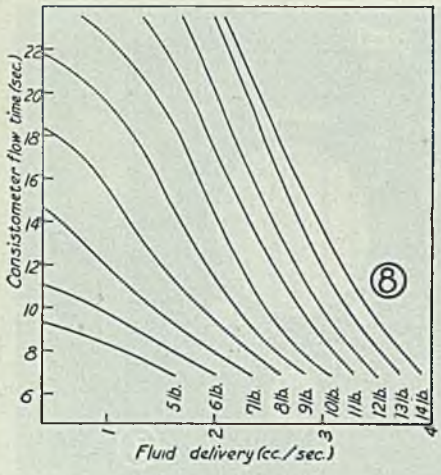


Fig. 8 — Constant pressure curves

operating pressure for the automatic gun from the plant-pressure system at approximately 100 psi. The main line pressure was piped through an air transformer at line pressure to the quick shut-off valve for operating the automatic spray gun. The line pressure was reduced through the transformer to the atomizing line and the fluid tank. A second transformer provided a controlled air supply for the throttler controller mechanism, which in turn actuated the diaphragm valve controlling the pressure on the fluid tank. The throttler controller gave accurate control of fluid pressures to within plus or minus 0.2 lb (Fig. 3).

To obtain data on the viscosities of the various enamel slips, a modification of the Harrison consistometer was designed which would permit a relatively simple but at the same accurate measure of the relative viscosity of the slips in the terms of the number of seconds required for 100 cc of slip to flow through a capillary at the base of the flow tube.

The preliminary investigation and investigations previously conducted by the manufacturers of the equipment revealed the following facts:

(1) In spraying, the charge on the grounded object is always positive and the charge on the electrode is always negative; the charge in the field, therefore, is always negative and the charge placed on particles entering the field will be negative.

TABLE I

EFFECT OF VARIATIONS IN SET

Sample No.	Flow time (sec.)	Atomization	Enamel wt. (gm)	Appearance of sprayed plate
82	22.7	3	45.6	Good
83	21.3	3	41.1	Good
84	18.5	3	40.1	Slightly dry
85	15.6	3	38.1	Slightly dry
86	12.2	3	38.1	Sagged
87	10.9	3	38.1	Sagged

TABLE II

EFFECT OF VARIATIONS IN FINENESS

Sample No.	Fineness (% on 200-mesh)	Atomization	Enamel wt. (gm)	Application (%)	Sprayed plate appearance
77	15	3	539.3	33.7	Granular
78	10	3	549.7	32.1	Granular
79	5	3	536.0	28.8	Slightly granular
80	2	3	532.8	28.3	Slightly granular
81	On 325-mesh 2	2-3	538.3	34.1	Good

Fig. 9—Spraying process without electrostatic field

Fig. 10—Spraying done with the electrostatic field in operation

(2) There is no means of act measuring the force of the field; length of the spark gap is an app mate measure of this force.

(3) Increases in voltage within limits of any single installation do appreciably affect the force of the trostatic field.

(4) The dielectric strength of a material has no effect on the a of that material to react to the fo the field.

(5) Additions of electrolytes ha effect on reactability of enamel slip

(6) In spraying irregular shee is essential that the electrode s conform in contour to the conto the object being coated.

(7) A spacing of from 6 to 8 i tween electrode wires and 10 in. between the electrode and th ject has been found most efficient.

(8) The axis of the spray must an acute angle of 15° with the s to be coated for most efficient res

(9) The uniformity of the coat dependent largely on the location spray gun.

(10) The smallest fluid tip ava and an atomizing cap with a max number of air holes provides a max degree and uniformity of atomizati

(11) The effect of particle siz ability to react to the field lies i force of inertia in particles of incr size and density. The greater th ertia of the particle passing throug field, the less effective the force o field; no maximum effective particl has been determined.

(12) A maximum degree and formity of atomization is essential

(13) A coating of enamel alread plied to an object being coated parently has no effect on the abili that object to pick up additional coa

(14) The most satisfactory sp gravity lies in the neighborhoo 1.70 gm per cc.

(15) Ground-coat and cover-coat mels may be sprayed with an equa gree of satisfaction.

(16) Fluid and atomizing pres must be controlled more accur than can be done by ordinary mea

(17) The capacity of any single

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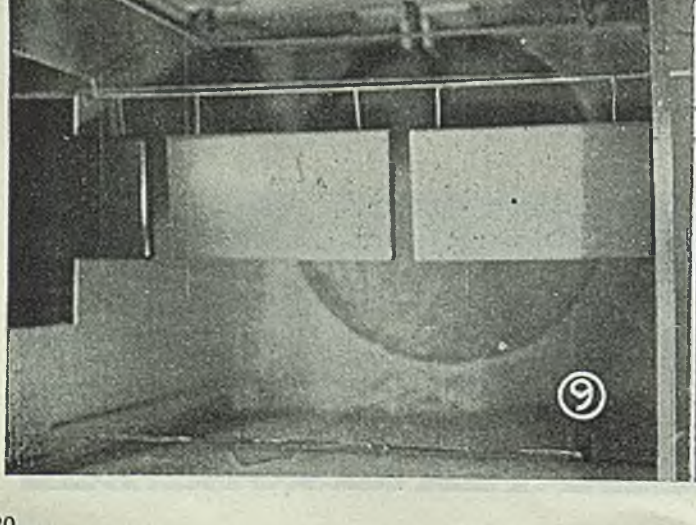
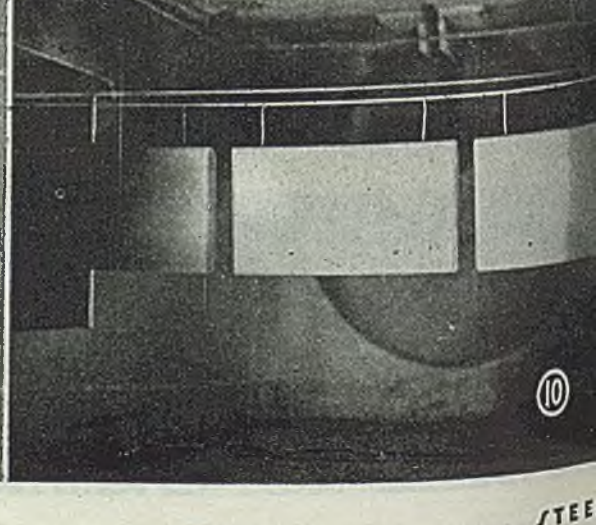




PNEUMATIC Scrap Collection

PNEUMATIC collection and disposal of light industrial scrap as well as chips in the form of turnings and borings has stimulated employment of flexible air-flow conveying systems, suction and blower operated, in both steel and non-ferrous metal fabricating plants. Higher production, stress on segregation, improved economy in oil reclamation and reduction in handling hazards are contributing factors.

Milling machines, lathes, automatic screw machines, drill presses and slab millers in the brass industry tend to accumulate chips in large quantities. Often removed manually at uncertain intervals, these accumulations handicap workmanship and appearance.

Pneumatic removal at the source eliminates bulky accumulation. Too, disposal is largely automatic, like many of the machines to which the system is applicable. Also minor cuts and accidents are reduced, for often chips are razor-sharp.

In suction systems, the air drawn past the cutters cools them conserving cutting oil to a considerable degree as well as contributing to the reclamation. When fumes are generated, these are also drawn from working areas. While in engineering principle, pneumatic conveying systems by suction are more or less standard, flexibility is broad enough to operate on steel, brass or aluminum, covering the gamut of metal cutting equipment.

B. F. Sturtevant Co., Hyde Park district, Boston, has installed numerous chip and turning conveying systems, designed for pneumatic distribution and disposal with capacity of better than 8000 lb per hour.

Typical installations with pneumatically created suction for chip removal are employed in the brass fabricating industry slab millers. To remove outer scale and impurities from slabs of brass and copper after being cast to required thickness and width, slab millers (a single head planer) are used. The knife, a series of milling cutters set side by side to a width of 30 in. in some setups, removes thousands of chips an hour.

Scale from 0.007 to 0.015-in. is released, chips curling tightly to about 1/8-in. in diameter, 1-1½ in. long. Abrasive and sharp, they must not pass through conveyor fans.

Servicing two slab millers simultaneously, a hopper at the bottom of each miller collects the chips by gravity. From these hoppers the chips are conveyed through ducts into a Cyclone separator where they are separated from the air stream, falling into airtight storage bins. The air is drawn through the exit tube of the Cyclone into a fan and discharged to atmosphere.

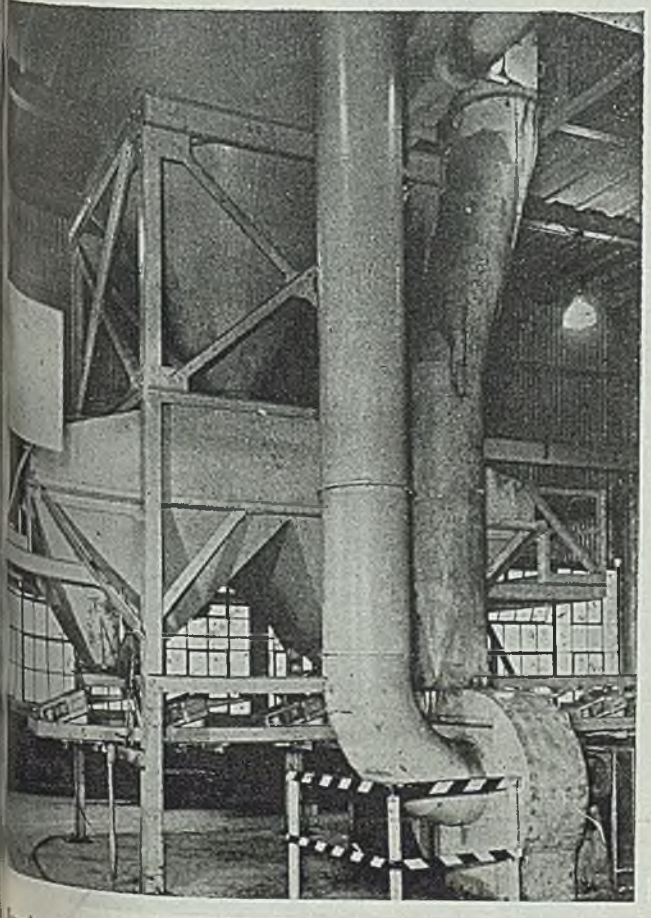
The storage bins are made with two compartments, an air operated blast gate distributes the load into either compartment at the will of the operator. The bottom of each storage bin is also equipped with air operated blast for dumping. Above gates are interlocked, so can be operated only in proper sequence.

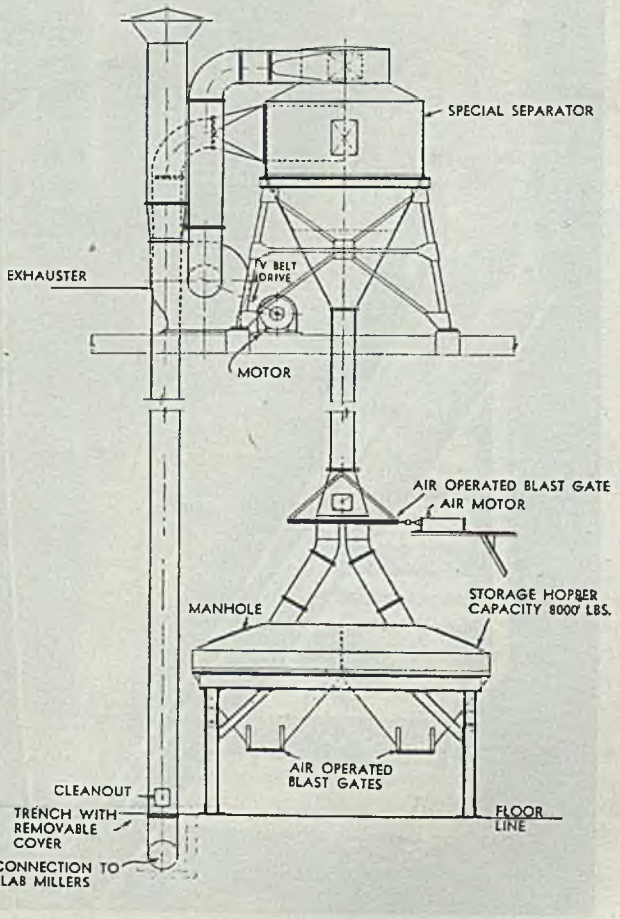
The volume of air per pound of

(*Please turn to Page* 178)

Left—Installation of pneumatic conveying equipment at Indianapolis plant of Bridgeport Brass Co. B. F. Sturtevant photo

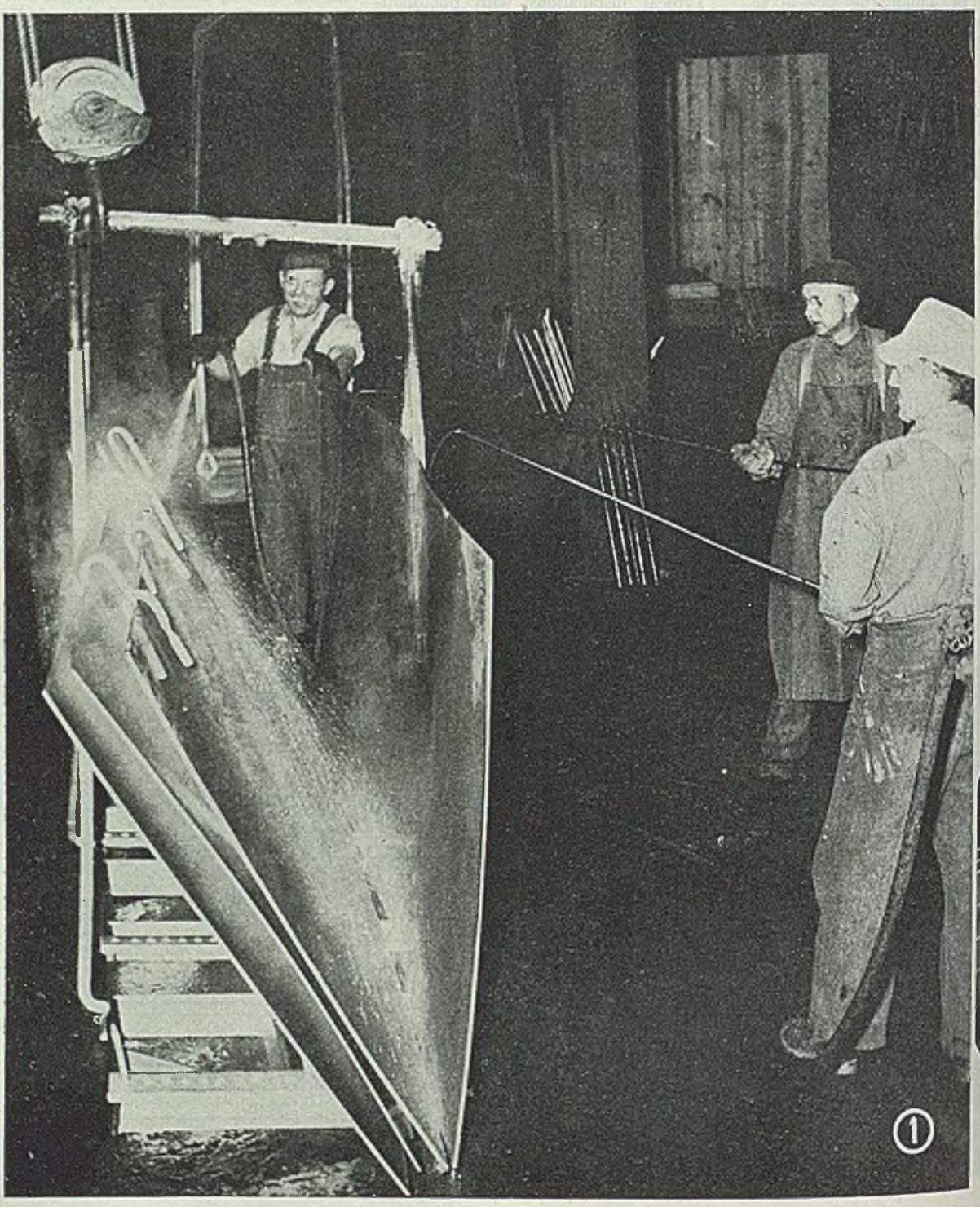
Right—Diagram of elevation showing arrangement of pneumatic conveying equipment for exhausting brass chips from a slab miller





SODIUM HYDRID

Bath containing active sodium hydride penetrates through stainless steel and uniformly descales all surfaces with no loss of metal and no deleterious effect on structure. Disposal of waste residue eliminated



DESCALING

By L. W. TOWNSEND
Manager
Composite Steel Division
Jessop Steel Co.
Washington, Pa.

SODIUM hydride descaling process is a relatively new method of removing scale formed on steel by oxidation at elevated temperatures. Particularly suited for descaling stainless steels, the method eliminated objectionable features of acid pickling. It is based on use of a powerful reducing agent—sodium hydride dissolved in fused caustic — which reduces the metallic oxides in the scale.

With this process, reduced scale remains in loosely adherent form on the surface of the work. Sodium hydride is formed in the fused caustic bath by combining sodium metal with hydrogen in generators installed in the caustic pot. In operation, scale is reduced by immersing work in the fused bath. Upon quenching work in water, reduced material is blasted from the surface by a few seconds' dip in acid.

Jessop Steel Co. has used its installation to pickle stainless steels of all types —pure copper, pure nickel, high-speed composite tool steel, and high carbon high-chromium tool steel, as well as Stellite type alloys. In fact, the process is to be recommended for use by any mill producing electric furnace steel.

In the production of stainless clad steel at Jessop, one of the early problems faced was that of creating a white, pickled stainless surface and at the same time preventing the over-pickling of the low alloy backing steel. The need for a method of pickling which would not dissolve a film of metal from the surface in order to remove the oxide formed during heat treatment had long been recognized at the time this process was introduced. Obviously, loss through dissolution of as much as 3 per cent of the weight of stainless sheets, in order to produce the proper finish, was a very great waste of acid, stainless steel, and time. This applied to any pickling process antedating sodium hydride descaling.

The condition described was true of the 18-8 stainless steels. However, on the higher chromium-nickel stainless steels, and the higher straight chromium steels, this condition was even more wasteful, as some of these types could not be pickled at all until after they had been thoroughly sand blasted or grit-blasted. After considering the solid stainless steels and rustless irons, the waste involved in the acid pickling of composite sections where one side is low carbon steel becomes obvious. Sodium hydride pickling (descaling) has proven to be the solution to many of these difficulties.

In essence, the problem was to produce a pickling bath which would not dissolve metal, and make it so oxygen-hungry that any oxide on the metal would be reduced or partially reduced to such a condition that subsequent removal could be accomplished with a minimum dissolution of the metal itself. The bath developed which would not dissolve the metal is molten caustic.

The bath has to be maintained at 700° F so that the caustic will remain molten. As will be shown later, this temperature also serves another purpose. The method used to make this molten caustic bath (76 to 78 per cent caustic) oxygen-hungry is by addition of metallic sodium, along with hydrogen, so as to form a solution with 2 to 3 per cent sodium hydride in molten caustic. Sodium hydride dissolves in molten caustic and the resulting solutions reduce iron oxide to metallic iron. Sodium hydride reacts with the scale ($Fe_3O_4 + 4NaH \rightarrow 3Fe + 4NaOH$) to form caustic soda, which is the material comprising the bath itself.

Equipment. Required conditions for descaling are met by construction of a low-carbon steel tank (Fig. 3) 20 ft long, 6 ft deep and 6 ft wide, mounted in brick setting with the top about 3 ft above floor level. Around tank is constructed a furnace with a gas burner at each of the four corners and flues running around the tank and up a stack. Automatic heat controls are installed to maintain the bath at proper temperature with a minimum of manual adjustment. There is an excessive loss of hydride at higher temperatures, whereas at lower temperatures additional time is required to melt to the reaction point the frozen layer of bath which forms.

Along one side of the tank are the

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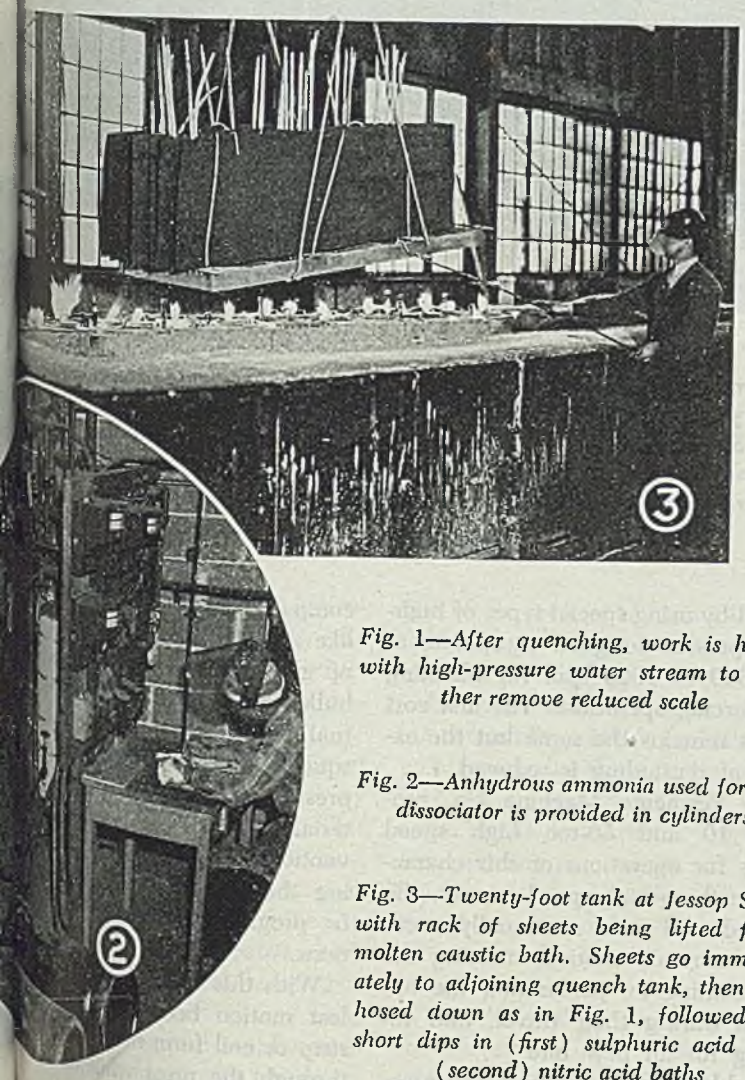

Fig. 1—*After quenching, work is hosed with high-pressure water stream to further remove reduced scale*

Fig. 2—*Anhydrous ammonia used for this dissociator is provided in cylinders*

Fig. 3—*Twenty-foot tank at Jessop Steel with rack of sheets being lifted from molten caustic bath. Sheets go immediately to adjoining quench tank, then are hosed down as in Fig.* 1, *followed by short dips in (first) sulphuric acid and (second) nitric acid baths*

Fig. 1—This 30-ton capacity super speed press at Ford Motor Co. has turned out more than 1,000,000 aircraft generator pole piece laminations like those shown here in a single 48-hr week, using only one operator. Stock is drawn continuously through roll feed and formed parts are stacked automatically and returned to front side of press through chute. Operator is shown unloading chute by threading wire through laminations. Ford Motor Co. photo

COMBINING old as well as new materials with new processing and fabricating methods often produces end products that are lighter, stronger and have lower production costs. Stamped steel products are an example. Much progress has been made in breaking down products and processes into unit operations that permit increased output of major importance to reconversion and peacetime economy.

Certain manufacturers of stampings, such as the Ford Motor Co., have discovered that production per press and per man can be greatly increased by using special types of high-speed presses designed to operate at from 350 to 1000 rpm for blanking and piercing operations. The first cost of dies remains the same but the expense of regrinding is reduced.

The Ferracute Machine Co. produces 10 and 30-ton high speed presses for operations of this character. In these high speed presses, the die bed and ram continually oscillate in a rotary motion, meeting the work coming in, performing the operation during their travel, and returning for an new bite.

The blanking operation in this press compared to conventional practice like *shooting* a bullet through a pe of glass as compared to *throwing* bullet at the glass. The blank is a tually knocked out clean instead squeezed or forced through. St presses will blank or pierce any m terial that can be handled in a co ventional press of equal tonnage, ing the same type of single stati or progressive dies up to five st tions.

With this type of press there is lost motion because the material strip or coil form moves continuous through the press while the work

SMALL PARTS at High Speed

Ford Motor Co. turns out 1500 blanks per minute on high speed press. Where material and conditions permit, speeds up to 2000 pieces per minute are reported

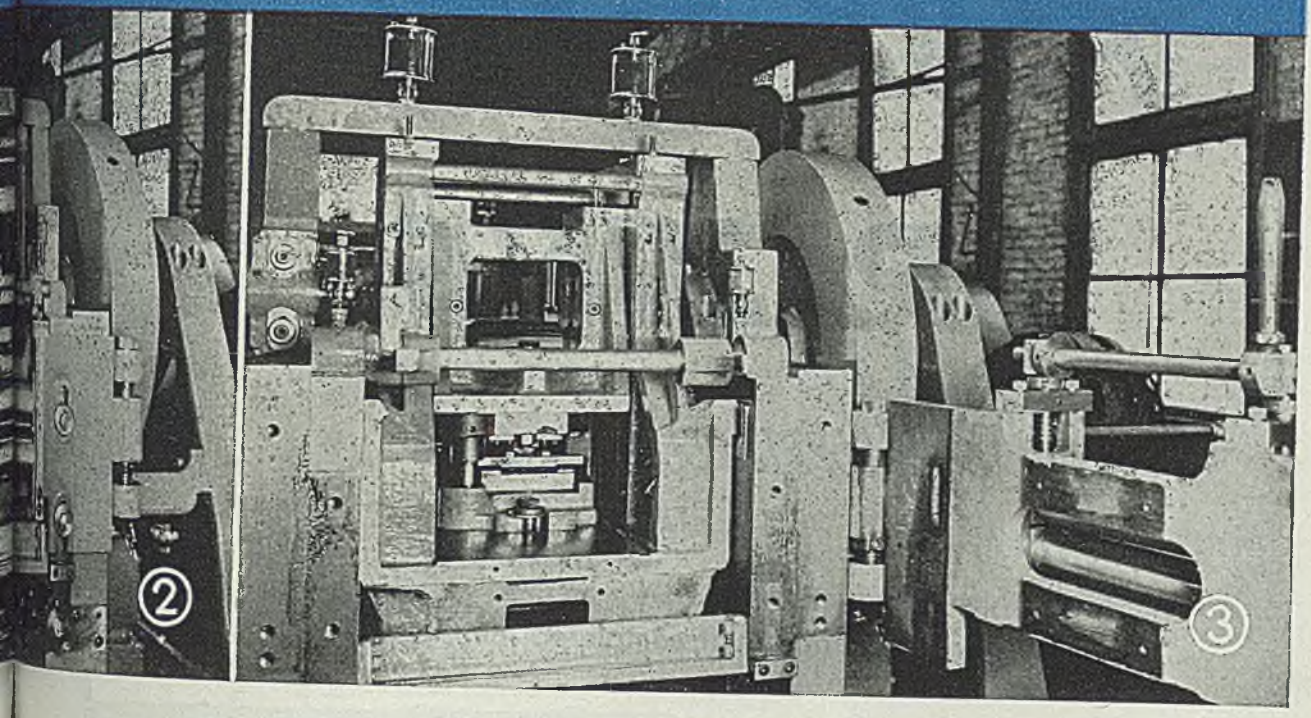

Fig. 2—Ferracute high speed press shown with roll feed mechanism in place

Fig. 3—Same unit as Fig. 2 but with roll feed swung away on its hinges to reveal dies which reciprocate in synchronization with movement of stock through the press

ing done. This makes possible pro-duction speeds limited only by the physical characteristics of the product nd the maximum speed of the ma-hine.

The horizontal bed of this type of ress is horizontally reciprocated by n eccentric driving crank. This ovement is in the same plane and irection in which the work strip is d. The punch holder is attached to he press ram and reciprocated verti-ally by the same crank movement hat reciprocates the bed or die. Thus he press moves the tool rapidly from ight to left coincident with the direc-tion of the feed, at the same time that the cutting members are rapidly open-ing and closing.

Instead of halting the strip at blank-ing centers for cutting, the strip passes uninterruptedly through the die and is blanked and/or pierced at each down stroke of the crank. Speeds of 1000 strokes per minute are feasible for light, simple work. The speed can be quickly and easily adjusted to conform to the character of the work being produced.

The material feed can be adjusted to the correct speed for minimum scrap while the machine is running.

One company has produced 2000 blanks per minute on one press of this type, day in and day out, for sev-eral years.

Savings possible are illustrated by the use of these presses at the Ford Motor Co.'s plant at Ypsilanti, Mich., where they have been a contributing factor in the production of more than a million generators and starters for military vehicles and aircraft.

The two presses, a No. 1 (10-ton) and a No. 3 (30-ton), were used be-fore the war to make insulators and small parts for Ford cars. With the

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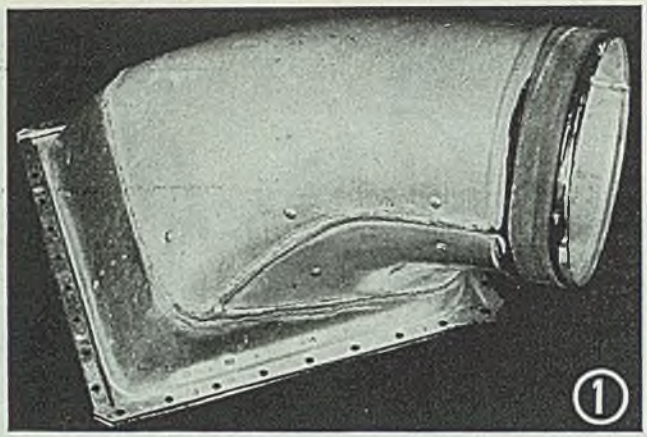
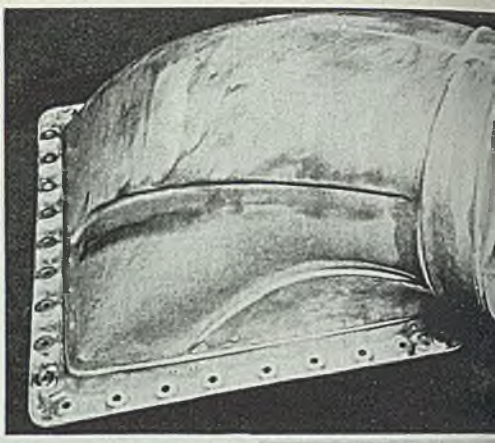
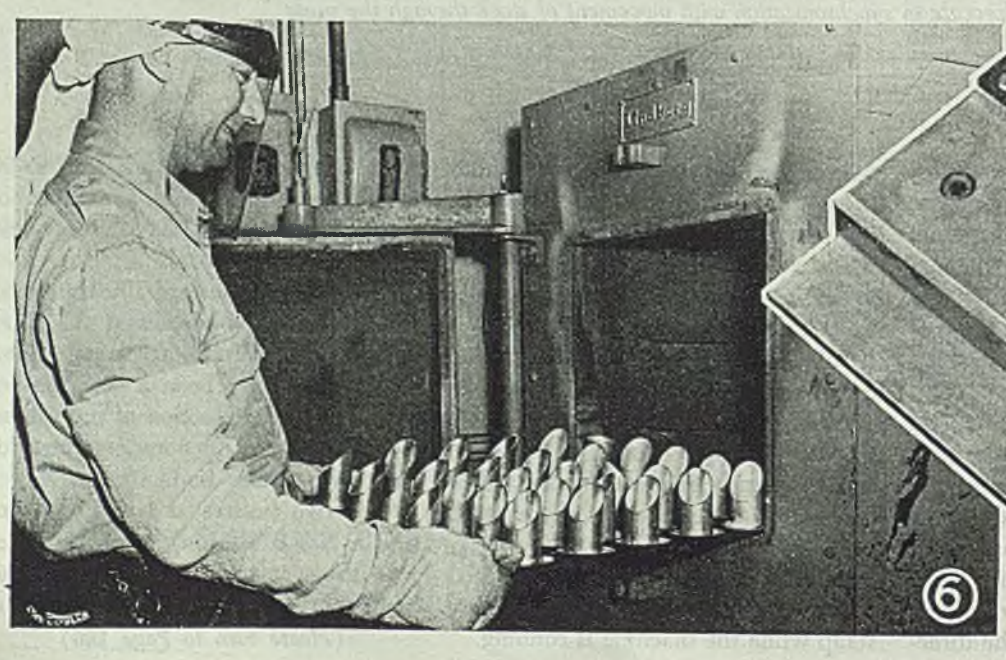


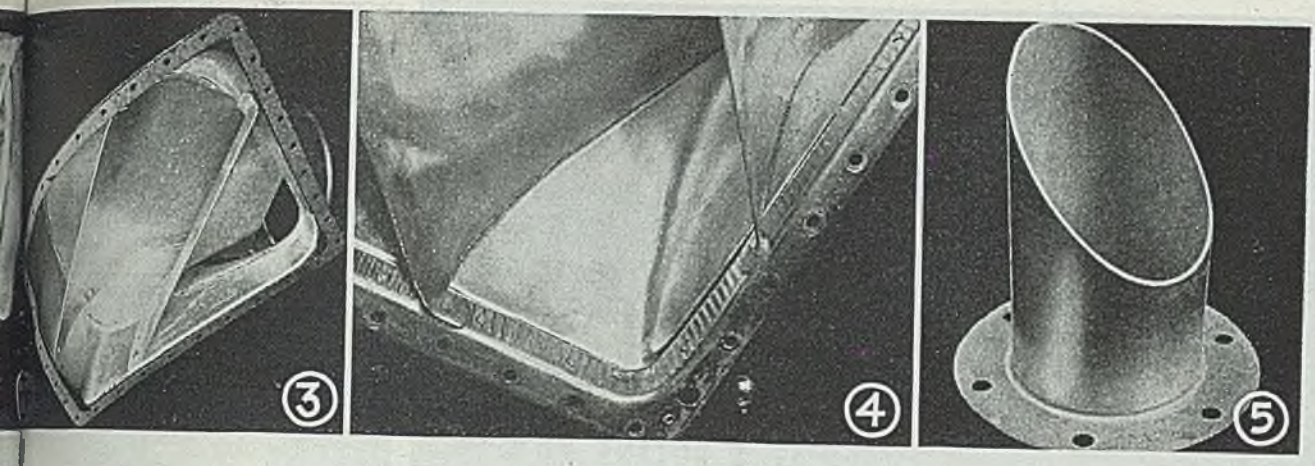


FLUX BATH BRAZING of Aluminum Parts

A resumé of a furnace aluminum brazing method resulting in accuracy and neatness of completed joints

By MAURICE BEAM
Editorial Correspondent, STEEL
Los Angeles





TWO production processes for the furnace brazing of intricate sections of some alloys of aluminum, which may be called new, are (1) those done in a standard hot air furnace, and (2) in a molten-flux-bath furnace.

Pioneer in this process has been the Aluminum Co. of America, and today it holds the basic patents on several methods. It has been reported that some 50 per cent of the effort expended in the Alcoa Research Laboratory has been directed at the development of aluminum brazing in the years since about 1937.

The following data on aluminum brazing has been briefed from information contained in the research files of the Aluminum Brazing Co., North Long Beach, Calif., as collated by Arthur H. Brown, chief metallurgist for the concern. At this firm the salt bath (flux dip) furnace method is being employed with a degree of success that leads company's owners, Mr. Brown and O. A. Smith, to the view that the flux dip bath is superior to the original and more widely used hot air operation.

Basic premises on which the company's brazing developments rest are found, of course, in the original work done by Alcoa. Additional facts, including one patentable feature to be described later in the article, are founded upon years of experiment by the members of the firm; some of this work was accomplished during Mr. Brown's association with the field division of Consolidated Vultee in Los Angeles.

By definition, aluminum brazing is the process of joining parent sections with a filler material of lower melting point in which little or none of

(*Please turn to Page* 190)

Fig. 1—Gas welded assembly as originally made

Fig. 2—Assembly redesigned for furnace brazing. This was brazed in hot air furnace. Knurled lap joints at longitudinal seams and flange provide ideal clearance control. Screw machined flange bosses also are brazed. Fins are simpler construction and slide into the skin recesses providing a locating assembly and capillary environment. Resulting structure is stronger and lighter than former assembly

Fig. 3—Bottom view of gas welded assembly. The vanes were drop-hammer formed

Fig. 4—Bottom view of brazed assembly. One boss has been omitted to show locating method in the pierced hole. After fin has been slid into place, two tack rivets hold it in position during brazing

Fig. 5—Finished brazed assembly. All photos from Consolidated Vultee Aircraft Corp.

Fig. 6—Parts are removed from the furnace and placed into water quench

Fig. 7—Tooling method used to locate the tube bevel in relation to the flange hole pattern during a light press fit assembly operation

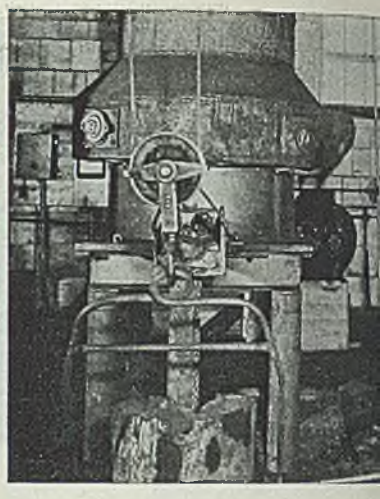
Fig. 8—Applying flux. This step is omitted in the flux dip technique

Producing SPONGE IRON IN A ROTARY KILN

Pilot plant operated by Bureau of Mines at Laramie, Wyoming, employs coal to reduce iron in the ore to metallic form. Abrasive polishing treatment removes large percentage of impurities in granulated sponge iron. Charging and firing practices are being varied to afford lower cost of production. Details of equipment and process are presented in this article

BY T. L. JOHNSTON
Metallurgist
Bureau of Mines
Washington

Fig. 1—Sponge iron nodules which were shipped to nearby steel plant

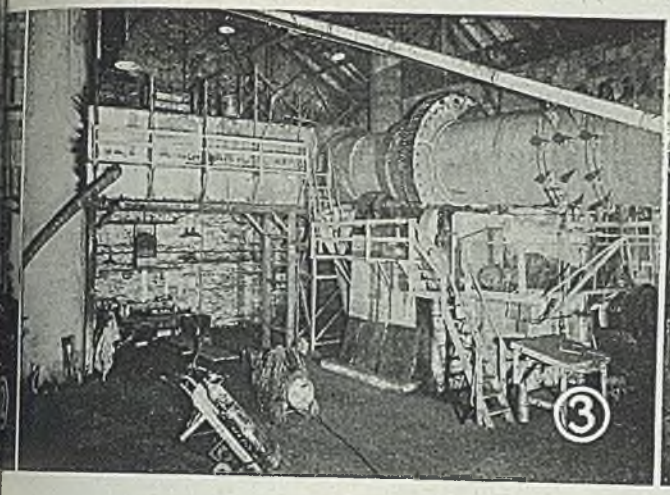


DIRECT reduction of iron ores cast iron or steel is one of the ol known metallurgical techniques, but si development of the blast furnace open-hearth furnace, such methods h been superseded by the two-step p ess in which first cast iron and t steel are produced. Undoubtedly, modern steel plant with its large b furnaces and open hearths is the m efficient means of producing steel in gions where there is a plentiful sup of iron and coking coal. Howe there are a large number of iron ore posits, particularly in the Western Sta that are too small to justify the cap outlay required for the construction blast furnaces and too remote from ex ing plants to allow shipping the ore smelting.

During the shortage of scrap i brought on by the war production p gram, interest was revived in the di reduction of iron ores as a means of creasing the production of iron and ste The product of direct reduction is porous sponge iron made from iron without melting. Various methods making sponge iron had been devis and many processes patented, but prac cally all work done was on a small sc not proved commercially feasible. R ports from Germany and Japan indicat that sponge iron was being produced those countries and used to augment th iron and steel supply for prosecuting t war. The need for further developme on enlarged scale was considered wi

The Bureau of Mines, acting und Congressional appropriation of 1942 f the investigation of sponge iron, initiate a broad investigation of the productio of sponge iron, partly to provide a su stitute for scrap iron and partly to pe mit some of the smaller, scattered iro deposits in this country to be brought int production.

Shortage of scrap iron is no longe a serious problem. However, becaus the larger iron ore deposits are bein rapidly depleted, sponge iron processe for utilizing relatively small and scat tered iron ore deposits will have equa or greater significance in postwar years



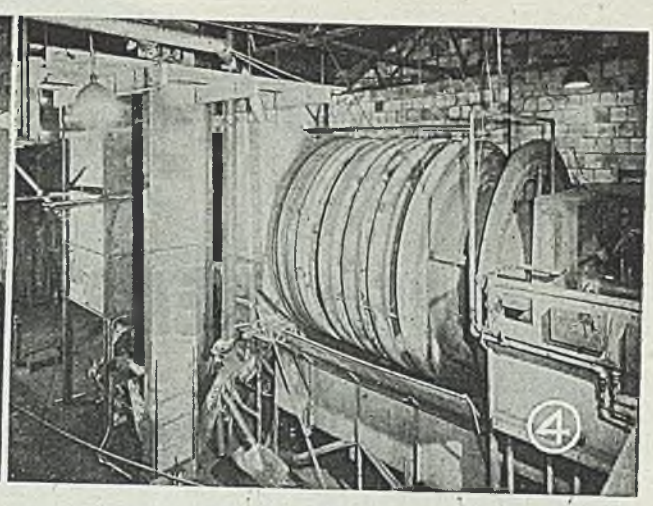


Fig. 2—Cupola in foreground; gas furnace right background

Fig. 3—Small diameter section of kiln, flue and bottom of stack

Fig. 4—Large diameter section of kiln showing spiral cooler mounted on outside

As part of the general program for the investigation of the production of sponge iron, the Laramie sponge iron pilot plant was constructed to produce sponge iron by reduction with solid fuel. It is one of the largest projects under the Bureau of Mines program and is designed to produce about 50 tons of sponge iron per day by reduction with coke or coal in a rotary kiln. Design of plant was based on previous work by the Bureau of Mines in 1920 to 1924. Construction was started early in 1943 and operations in February 1944. About three-fourths of the materials and equipment required was obtained secondhand from idle cement plants, gold mills, and junk yards. Alterations and additions have been made during operations and the plant is now a complete operating unit.

Plant Structure

The plant building, Fig. 6, is located in the north part of Laramie, Wyo., and consists of an old stone structure, originally built as a glass factory, with an addition of structural steel and corrugated sheet iron and lined with building tile. The plant covers an area 230 x 123 ft. A small warehouse and garages located near the main building are included in the acre of ground occupied by the plant, all of which is Government-owned.

The stone portion of the main building is divided into two parts. The smaller part is composed of two stories containing the offices and analytical laboratory and a basement in which the sample room and electric shop are located. The larger part is one large room, 70 x 74 ft, and houses equipment for crushing screening, grinding, conveying, and storing ore, coal, coke and by-products.

The structural steel addition covers an area of 128 x 81 ft and contains the rotary kiln with auxiliary equipment, a small machine shop, and an electric substation.

A spur track of the Union Pacific Railroad serves the main building on the west side. Electric power is provided by the Bureau of Reclamation, natural gas by the Rocky Mountain Gas Co. and water and sewage facilities by the City of Laramie. Outside storage space for raw materials is provided.

The most important piece of equipment in the plant is a large rotary kiln which was designed after the two-diameter kiln developed by the Bureau of Mines by Williams, Barrett, and Larsen.° Other equipment is provided to handle and prepare materials for charging into the rotary kiln and to treat products discharged from it, all arranged in a flow scheme to operate as a unit 24 hr a day. (See Fig. 7).

The rotary kiln was constructed of two sections joined; one section is 50 ft long and 6 ft diameter (Fig. 3) and the other is 30 ft long and 9 ft diameter, making a total of 80 ft. The 6-ft diameter section is lined with a 6-in. layer of firebrick and the 9-ft section with a 4-in. layer of insulating brick covered with a 6-in. layer of firebrick. The kiln is set at a slope of ½-in. to the foot and is driven by a 25-hp motor at variable speeds ranging from ½ to 2 rpm. Firing is done with either natural gas or pulverized coal. A special spiral cooler is mounted on the outside of the large diameter section of the kiln (Fig. 4). A brick-lined, concrete smoke stack 4 ft inside diameter and 120 ft high is connected to the kiln.

A small rotary kiln 19 ft long and 3 ft outside diameter placed alongside the large kiln is lined to form two sections; one section is 6 ft long and 27 in. inside diameter and the other 12 ft long and 18 in. inside diameter. This small kiln is used for preliminary tests as a guide to operation of the large kiln.

Equipment for handling and preparing iron ore, coal, and coke in carlots consists of crushers, grinders, driers, screens, elevators, and conveyors. Storage bins with a capacity of 200 tons of ore and 100 tons of coal or coke are provided. A dump truck and a tractor with a front-end loader are used to load and move materials to and from outdoor stock piles.

Equipment for handling and treating the product discharged from the kiln is arranged to separate the metallic iron from unburned coal and waste minerals and consists of magnetic separators, vibrating screens, roll crusher, a centrifugal polishing machine, and a briquetting press (Fig. 5). Bins for storing intermediate products are located in the circuit so that the various machines can be operated together as a whole unit or individually with materials from their respective bins.

A cupola furnace 3 ft diameter and a gas-fired melting furnace with auxiliary equipment are also provided (Fig. 2).

A dust-collecting system, consisting of fans, ducts, cyclone collectors, and flexible hoses, is installed to control iron and coal dust.

A sample room equipped with crushers, grinders sieves, and other equipment for preparing samples of ore, coal, and plant products is located in the plant. The analytical laboratory is equipped with laboratory-size furnaces, hot plates, and general auxiliary equipment sufficient to analyze raw materials and plant products.

Plant Operation

During the period the plant has operated, 35 separate tests ranging from three to eleven days' duration have been made in the rotary kiln. Each test was made to determine the influence of one or more of the many variables affecting the production of sponge iron. Some of the tests yielded good sponge iron and some a fair-grade product, while others resulted in the production of worthless material; all yielded valuable informa-

(*Please turn to Page* 140)

Published by permission of the Director, Bureau of Mines, U. S. Department of the Interior, Washington.

°Williams, C. E., Barrett, E. P., and Larson, B. M., "Production of Sponge Iron," Bureau of Mines Bulletin 270, 1927.

Commends

OPEN-HEARTH STEELMAKERS

For Maintaining Uniform Quality

AMERICAN steelmakers were highly commended for their ability to supply materials of high quality and reliability by a high ranking army officer at the joint meeting of the Industrial Minerals Division, Southern Ohio Section of National Open-Hearth Committee and the Ohio Valley Section of the American Institute of Mining and Metallurgical Engineers, Deshler-Wallick Hotel, Columbus, O., November 2-3. Registration totaled 243. Next year's meeting is scheduled at this same location, Oct. 26.

Speaking only as an individual, and from the angle of the ground forces, the army officer pointed out that the uniformity of our equipment in World War II was particularly good and it showed a steady improvement as the war progressed. In his opinion, in every case, American equipment excelled that made by the Germans, in reliability and durability, and in almost every case in performance. The Panther tank, brought out by the Germans in 1944 was superior to ours in a measurable degree from the standpoint of mobility and performance, though it did not compare to ours from the standpoint of reliability. The Panther tank had a life of 50 hr operation between overhauls, whereas the American M4A had a life of 350 hr, or seven times that of the German tank. Moreover, as a useful standard, our tank has a life of 250 hr. The officer emphasized that twice in the war the reliability of tanks was a factor.

The Tiger tank was too heavy and too slow, the officer pointed out, and could be outflanked and outmaneuvered by the American tanks.

In discussing armor plate, the officer said that American material was of high quality and uniform throughout. Occasionally, pieces of German armor were found which were strong. Some of these sections could be cut like butter, whereas others required depth charges to penetrate them. German armor plate lacked uniformity, generally, he stated.

In conclusion, the officer emphasized that for the first time, the most powerful nation in the world is on the side of world peace. However, he made a plea that this country continue its research program, possess both offensive and defensive equipment to insure our ability to fight future fire, and train a sufficient number of men to assure that our fire department can move on the first alarm.

Some of the details of operating practice discussed at the morning and afternoon technical sessions follow:

Rammed Bottoms: One operator, in describing the method of installation and materials used, mentioned that the average ramming time was 34½ hr. The furnace was kept on gas for 30 hr, and then fired with fuel oil for 60 hr. The time spent burning in the burnt material, on some of the rammed material, amounted to 53 hr. The average time for ramming and charging, he stated, was 7 days. The average material used was 75 tons of ramming material, 14 tons of magnesite on top of the ramming material, and 3½ tons of slag with the magnesite. In discussing the performance of rammed material, the speaker pointed out that on one furnace the lost time amounted to 25 sec per ton, on another furnace 12.5 sec per ton, and on a third furnace, 14.2 sec per ton. This compared with an average for the shop for 16.9 sec per ton, on a campaign of 135,604 tons. The thickness of the veneer burnt on averaged from 2 or 3 in. Two of the three rammed bottoms were high in magnesium and these gave the lowest delay time.

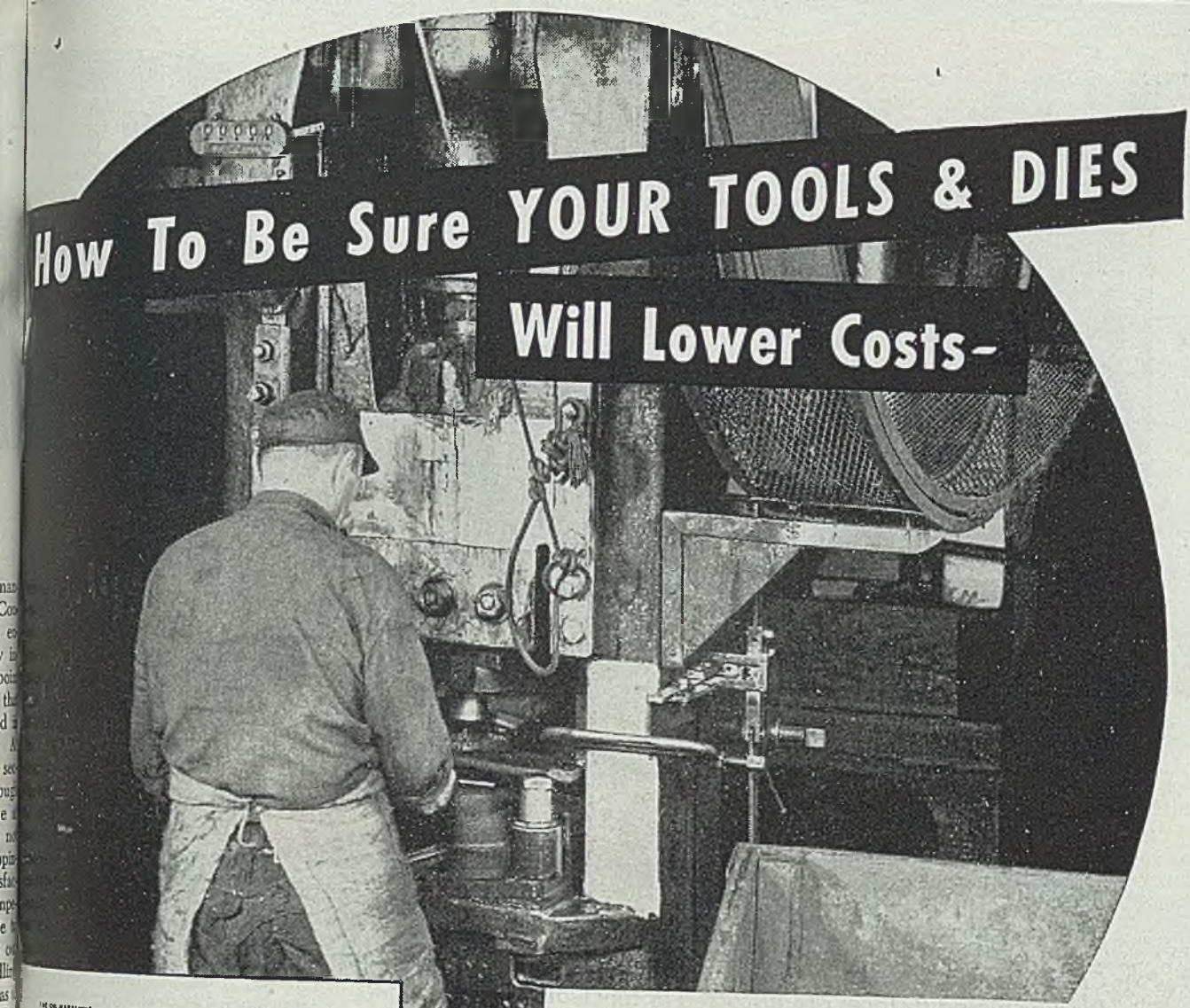
Pouring Refractories: In discussing nozzle and stopper technique on poured refractories, one operator suggested that a good stopperhead should have the following characteristics: Low softening temperature, high density, appreciable permanent expansion at 2400°F, and good workmanship, including freedom from lamination. The speaker pointed out that every clay-graphite stopperhead made today cracks when it comes in contact with molten steel. Another operator preferred stopperheads comparable to cone No. 26, equivalent to 2900°F. Above this temperature, he stated, his shop encountered difficulty in pouring.

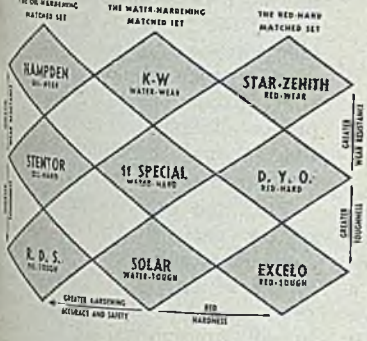
Vacuum Systems: At a shop in the Great Lakes district, employing this system for removing flue dust, the r hours were cut down 35 per cent. siderable wear at the elbows was countered, but this was remedied b stalling replaceable sections at the of abrasion. It was brought out the size of particles must be limite order to avoid clogging the lines. another plant the maximum cross tion of the hunks allowed to go thr the system is 4 in. The temperatu which the flue dust is moved was stated, but the general consensus of ion is that it can be transported sati tory just as soon as the checker te rature will permit men to get insid handle the dust. It was also brought that there is no incentive in han materials in the wet state, inasmuch packs at the elbow like concrete. operator, however, stated that wet dust can be moved satisfactorily extra water is used.

Molten Coatings: A heavy coatin tar applied to mold walls affords a coating for alloy grades of steel but tar must be applied uniformly, it found at one open-hearth shop. Al num-graphite gives fairly satisfactory got surface, according to one oper who is using the mix on grades of that have to be scarfed. Aluminum first was thinned with gasoline and sprayed along with graphite. As as the aluminum is not applied heavily, it will not build up on the wall, the speaker pointed out. On carbon heats the speaker mentioned satisfactory results are obtained by u a mold wash composed of graphite water. This should be kept in agitated tanks in the proportion of of graphite per gal of water. Thi sprayed while the molds are hot.

Mold Life: The consensus of opin is that the trend of mold life is be ning to increase again. Before the bottom pour molds at one shop ha life of 125 heats whereas during the their life declined to 100 heats. the speaker pointed out, is now on upgrade. He pointed out that crack is the most prevalent cause of m failure at his shop.

How To Be Sure YOUR TOOLS & DIES Will Lower Costs—





The Matched Set Diagram Really Works

The key steel is the one in the center, *No. 11 Special*, a straight carbon, tough timbre water-hardening tool steel. When you have a tool to make, you first find out if it should be made from *No. 11 Special*. If the answer is "Yes" you go no further. But when the answer is "No", you use the diagram to point the way to the proper tool steel for the job. For greater wear resistance you go north, etc. Just follow the diagram.

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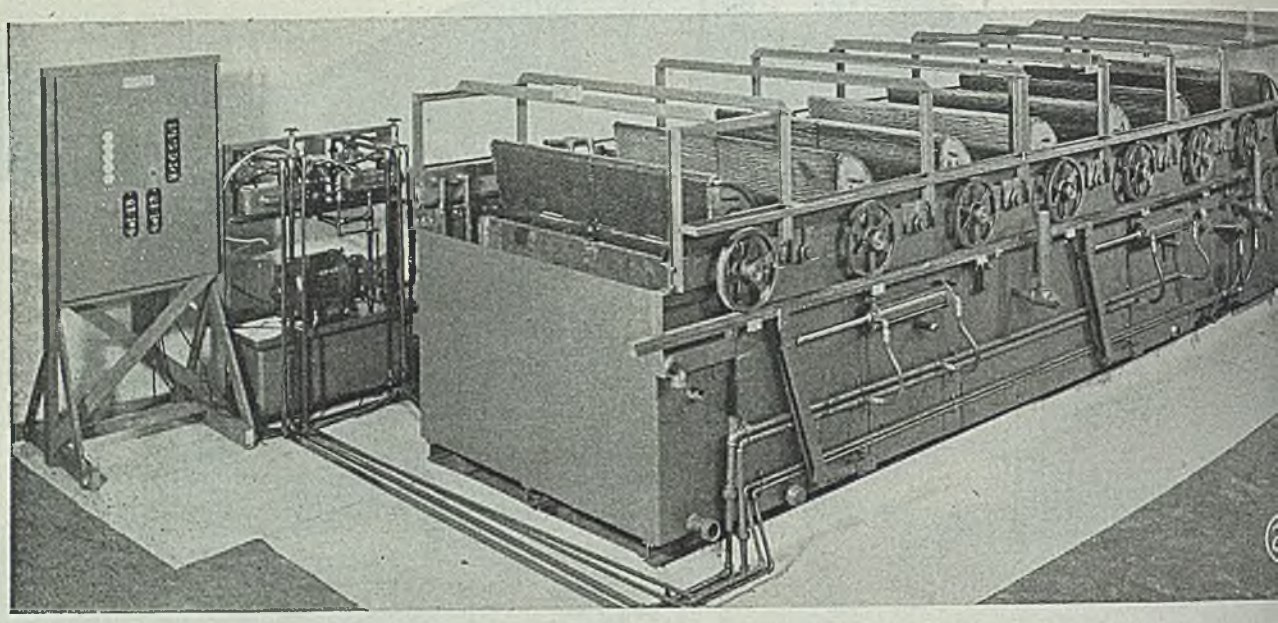


Fig. 24—One type of automatic bulk handling equipment used in chromating and Parkerizing of zinc plated parts. (Courtesy Udylite Corp.)

CURRENT Zinc Electroplating PRACTIC

Chromate, anodic and phosphate types of protective coatings for zinc plated surfaces are discussed in concluding article of six

By DR. ALLEN G. GRAY
E. I. du Pont de Nemours & Co. Inc.
Cleveland

IN some "bright" zinc plating processes a brown surface film appears almost inevitably upon removal of the work from the plating bath. This film may be removed by use of a dilute oxidizing acid bright dip. The film, however, does not occur with some brightening agents, in which case bright dipping is optional. A second desirable effect of bright dipping after plating is to improve resistance of the zinc plate to tarnish the finger staining although zinc deposits produced from old baths free from heavy metals possess in general excellent resistance to staining. Acceptable bright dipping procedures include a 5 to 30 sec dip in 0.25 to 0.5 per cent nitric acid or acidified hydrogen peroxide[70] consisting of 0.25 per cent sulphuric acid with 4.0 per cent hydrogen peroxide.

Chromate Films

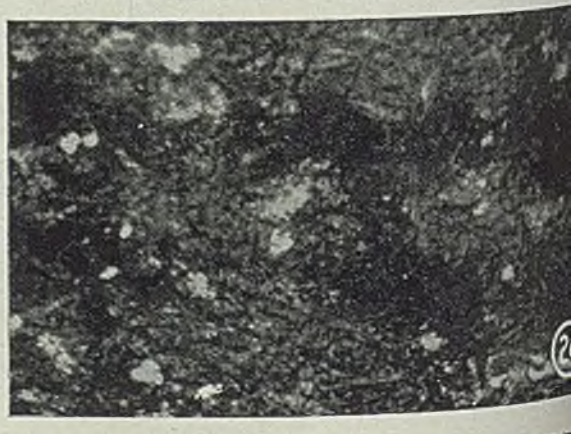
Protective coatings produced by converting the surface of a metal into a chemical compound of exceedingly low solubility in the environment to which it is to be exposed are becoming of importance and are being increasingly used.

As has been previously pointed o
resistance of most metals to corro
due to the formation of relatively
uble corrosion products on the surf
reaction with non-metallic eleme
the surroundings. By the choi
proper solutions and conditions it
sible to produce coatings of this t
almost any metal.

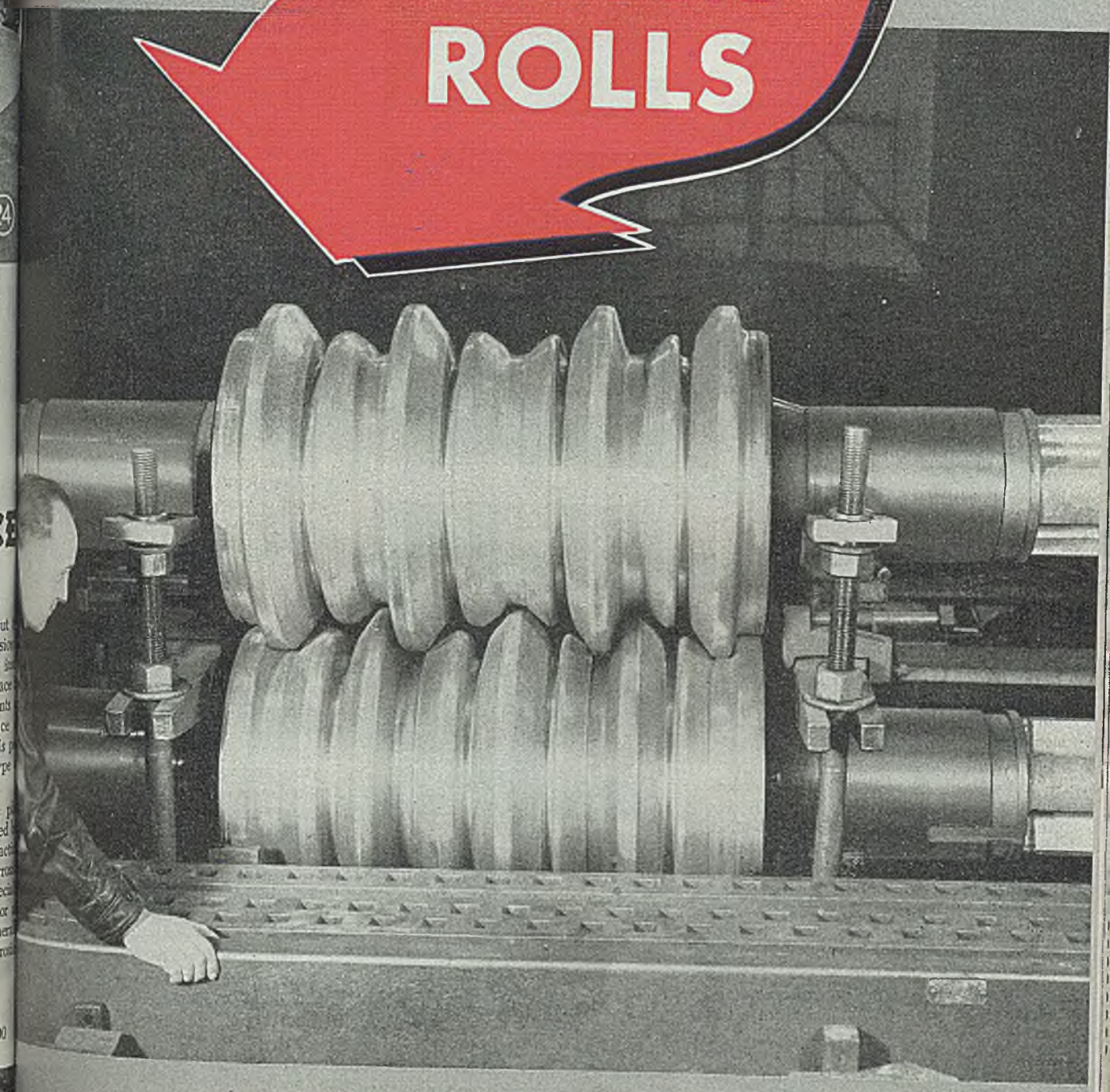
With the extensive use of zinc
ing on various steel articles, the ne
came more apparent for having pr
means of retarding the white co
products which form on zinc, esp
in salt atmospheres. In the outdo
mosphere the exposure of zinc ge
produces a thin gray film of co

Fig. 25—Zinc plated steel plus phosphate coating. X300

Fig. 26—Zinc plated steel plus Jernstedt[78] predip, plus phosphate coating. X3



MESTA ROLLS



ARMY E NAVY

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products which has no real influence on the operation of the parts. However, stagnant water with limited access to oxygen, and water films which dry slowly represent a different situation. Under these conditions a non-uniform type of corrosion develops which results, in severe cases, in the formation of bulky films of white corrosion products. These films may hinder the operation of devices or otherwise be objectional. In severe cases involving zinc coatings early rusting of the underlying metal may occur. The "Cronak"[71] film process has been developed specifically to minimize this type of corrosion, and has found widespread use on zinc plated parts many of which must perform vital functions.

The normal operation of the "Cronak" process is given below: Cleaned work or work which by virtue of its past history needs no cleaning is first wet with water following which it is dipped for approximately 10 sec in a solution consisting of:

Sodium Dichromate ($Na_2Cr_2O7 . 2H_2O$),
200 grams—26.6 oz.
6-9 cc—23-34 cc
Sulphuric Acid (94%-Sp. Gr. 1.84),
Water ..... 1000 cc—1 gal

The work is then removed, drained for not over 30 sec and rinsed *thoroughly* in cold running water. The water is then removed, preferably by air-blasting.

Careful chemical and physical studies of the "Cronak" film have led to the conclusion that it is a basic chromium chromate of the general formula:

$$Cr_2O_3 . CrO_3 . XH_2O$$
or
$$Cr(OH)_3\ Cr(OH)\ CrO_4$$

It is a characteristic of the "Cronak" film that it slowly releases its hexavalent chromium to water which comes in contact with it. It is believed that this dissolved material inhibits the subsequent corrosion of the zinc and insures that accidentally bared zinc areas are protected.

"Anozinc"[72] is a type of conversion coating which is formed anodically by treating zinc plated articles in a modified chromate bath with the use of electric current. The procedure followed is similar to that used in anodizing aluminum. Properties claimed[73] for the "Anozinc" coating are hardness and good wear resistance as compared to non-electrolytic coatings. Two types of these coatings are available, a yellow and a black. According to reported chemical studies the yellow coating appears to be largely zinc oxide and zinc chromate with some soluble chromate absorbed from the solution. The black coating is similar except that in addition it also contains basic chromic chromate. Both type of coatings retard the corrosion of zinc. The coatings as formed are reported to be non-fragile and can be handled wet or dry immediately after processing or dried using standard methods for plated parts. Of particular interest are the claims[73] that such coatings will stand flexing, forming and drawing operations satisfactorily, and are stable to heat, no tendency toward chipping or peeling, being evidenced even near the melting point of zinc.

The "Iridite" dip process[74] produces an adherent film on zinc plate and belongs to the general class of chromated zinc coatings. The finished product is covered with a corrosion resistant olive drab coating. Other colors also may be obtained. It is reported[75] that chemical studies have shown that the major portion of the "Iridite" type coating is composed of a chrome gel compound, probably lying within the group of chrome hydroxides or hydrated chrome oxides. The essence of the coating appears to be the chromium containing compound or compounds. The process by forming a continuous integrated surface film of chrome gel inhibits the tendency of zinc coatings to undergo solution thereby prolonging the life of the coating.

The phosphating of certain metals for increased paint and lacquer adherence has come into widespread use in the last few years. To manufacturers of many sheet metal products maintaining a fine appearance is a vital problem particularly in peace-time competitive merchandising. Paint, enamel, and lacquer are inadequate in themselves as a finish for articles that will be subjected to severe exposure because of the inherent tendency of the underlying metal to corrode causing premature paint failure such as chipping and peeling. The difficulty of maintaining paint and lacquer finishes is due to three main causes: (1) Corrosion of the underlying metal, (2) lack of adhesion of the paint or lacquer film to the metal and (3) the durability of the paint film itself.

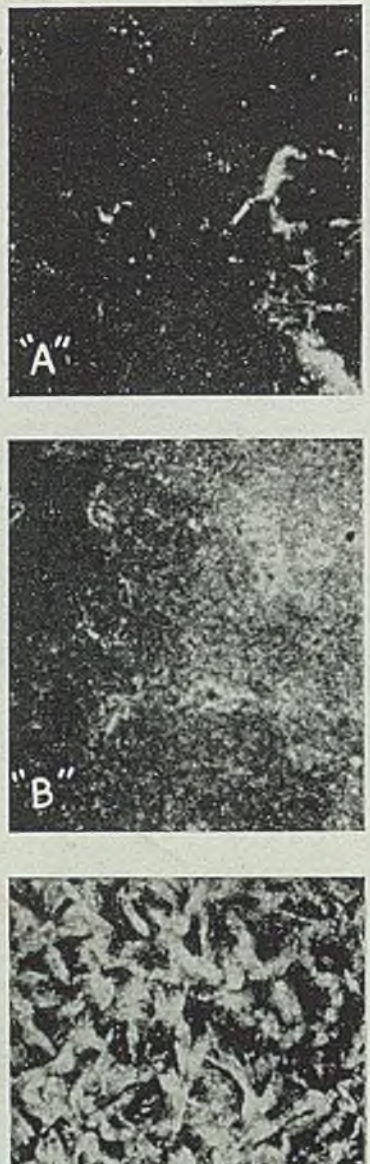


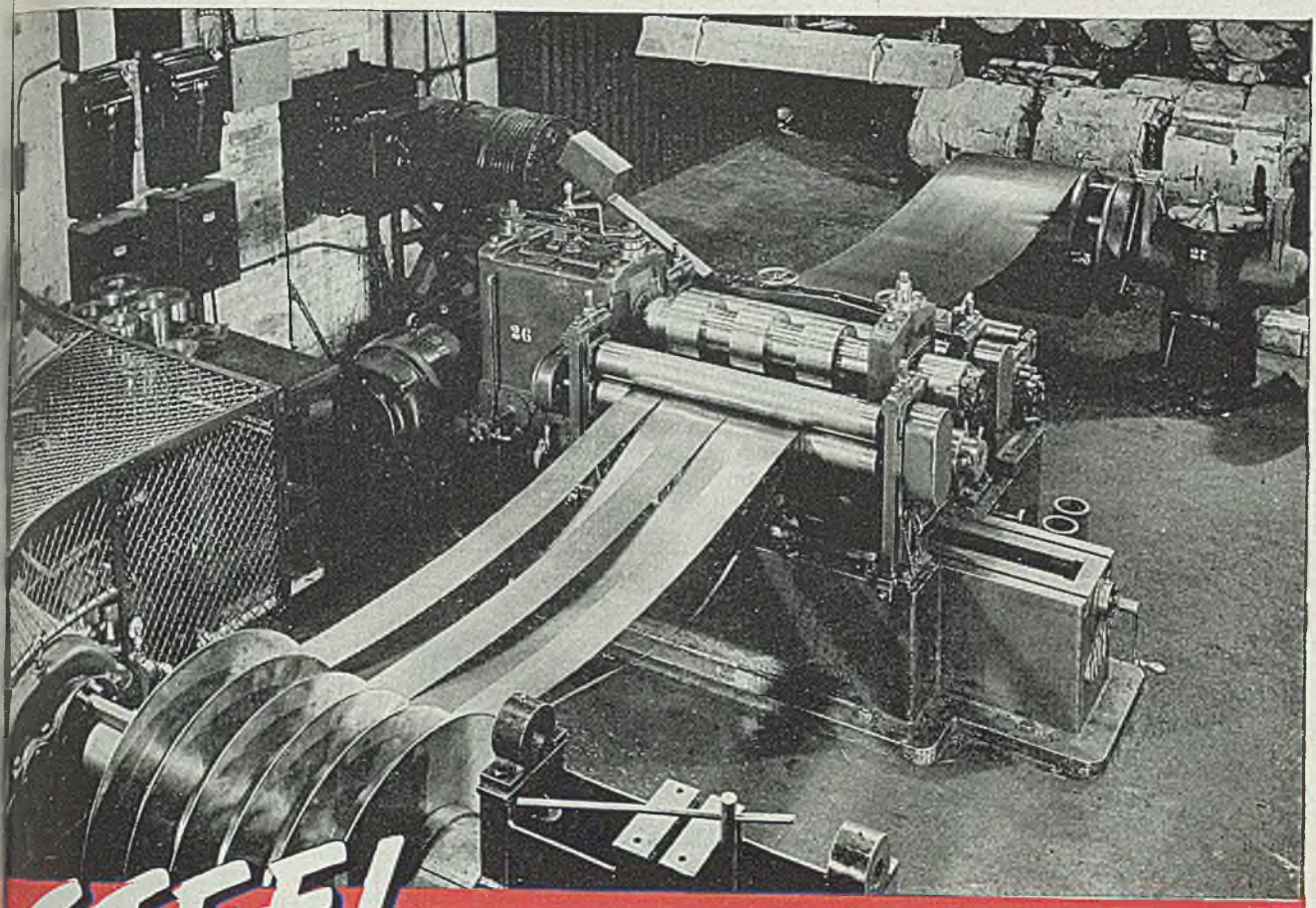
Fig. 27—Photomicrographs of zinc plated and "Bonderized" steel. A—Cold rolled steel; B—Zinc platea steel; C—Zinc plated and Bonderized steel. All X400

Phosphate Coatings

Although the phosphate method for treating metal surfaces dates back several centuries[6], the commercial development of the process is largely based on discoveries by the Parker Rust Proof Co. of the improved effect of certain additives to the bath such as manganese dihydrogen phosphate and alkali nitrate or nitrites[77] resulting in such generally used names for this type of surface treatment as "Parkerizing" and "Bonderizing"[77]. Present commercial specifications for phosphate coatings usually include a subsequent treatment such as paint, lacquer or wax. In the lacquering of straight zinc plated steel the presence of corrosion is still evidenced by the white powder formed from the zinc and by the subsequent flaking of the organic finish.

In the phosphating operation the outer surface of zinc is converted into a water insoluble phosphate coating, leaving a continuous layer of metallic zinc between the phosphate coating and the base steel for added corrosion resistance. The importance of the production of a fine grained crystalline coating structure on the surface was recognized throughout the course of development of phosphate coatings and has recently been studied in detail by Jernstedt[78]. Jernstedt claims that through the use of a special titanium dihydrogen phosphate predip prior to phosphating of zinc plated steel it is possible to increase the corrosion resistance quality of the resulting film considerably. Zinc plated parts with this finish have been used without any supplementary organic coating, and when an organic coating is applied such as lacquering, oiling, or waxing the corrosion resistance is reported to be improved over that ordinarily obtainable by phosphating.

The explanation proposed by Jernstedt[78] is that the activity of the titanium disodiumphosphate predip is probably due to the adsorption of a film containing the phosphate-ion on the metal surface prior to the treatment in a phosphoric acid bath. The titanium is supposed to be present in the predip as a colloid and possibly as a complex phosphate compound. Figs. 25 and 26 show phosphate coatings produced by Jernstedt on zinc plated steel both with and without the titanium predip. As can be seen from the photomicrographs[79] the phosphate coatings appear to consist of numerous microscopic



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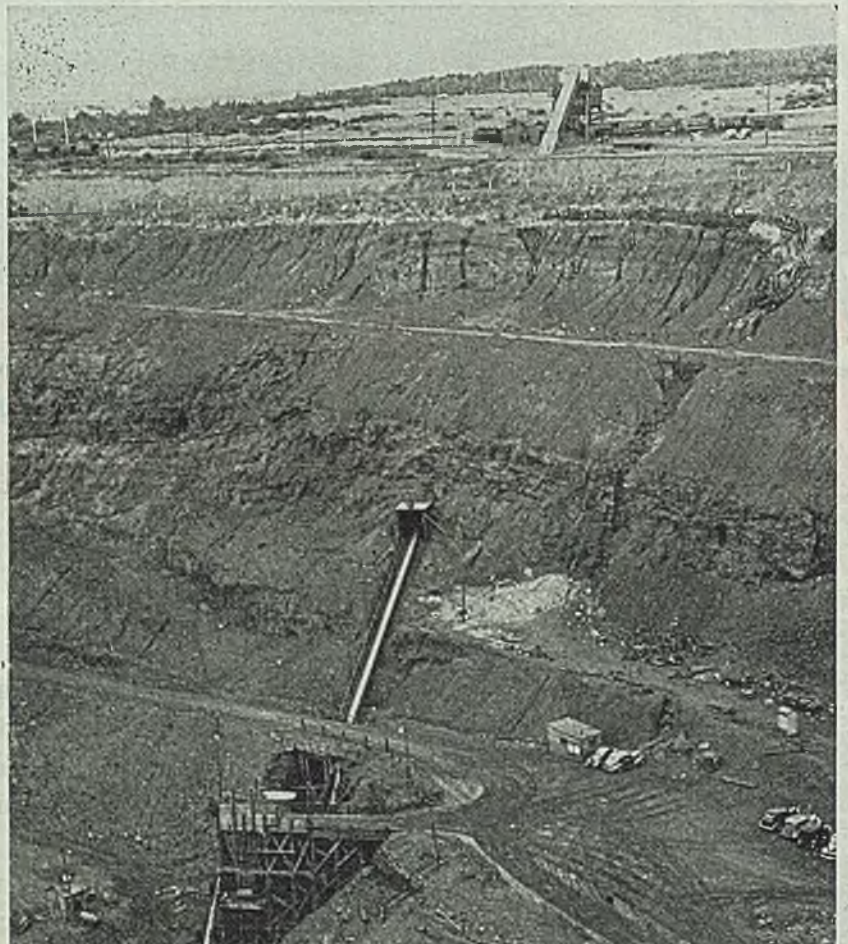
crystals integral with the metal itself. The finishing material must apparently flow into the interstices between the fine crystals and when dry, is securely anchored to the metal.

A corrosion resistant and paint holding zinc coated sheet has been developed and is being marketed by the various steel companies under their own trade names. The product consists in the electrogalvanizing of a uniform coating of zinc approximately 0.00002 to 0.00005-in[80] thick or sometimes 0.0001 to 0.0003-in, thick on steel sheet followed by phosphate treatment using a commercial process such as "Bonderizing"[77]. The deposition of the zinc and the phosphating is accomplished by continuously passing the properly cleaned strip steel or sheets through an acid type zinc plating bath and immediately followed by phosphating and rinsing.

Such finished sheets are being produced commercially and their availability should increase as more steel and equipment is made available. Due to the thin and adherent nature of the electrodeposited coating, sheets can be drawn and articles fabricated therefrom can be subsequently painted, since the preformed phosphate coating forms a satisfactory paint base. To avoid weak spots in the paint finish due to hand marks, grease, or other foreign matter, it is important that such sheets or articles formed therefrom be properly cleaned before painting. Shipment and storage of such sheets without rusting makes them especially suitable for many uses. The improved paint holding quality of the phosphate surface and the added protection against cor afforded from the zinc layer beneat paint and phosphate coating assure service life for such finished parts. 27 shows photomicrographs of zinc and "Bonderized" sheet steel.

Considerable war-time savings i zinc resulted from the use of the pr One estimate has placed the amo zinc consumed in the coating of phosphated zinc sheets at from 3 t of zinc per ton of 24 gage steel a pared with conventional hotdip ga ing sheets of this gage which requi proximately 200 lb of zinc per ton oz of zinc per square foot of steel. believed that these electrogalva phosphate sheets will be widely u the industry as they become more able, resulting in considerable savi zinc.



LONG LIFT: Believed to be the greatest lift made by any single conveyor belt in the world, this cord construction ore carrier made by B. F. Goodrich Co. is 1900 ft long. It is 30 in. wide, and center-to-center distance is 947 ft. Total lift is 272 ft, grade is 35.53 per cent, and speed is 578 fpm. Belt handles 550 tons per hr of wet or dry ore, and in its first year of operation handled 1,250,000 long tons of ore and saved $15,000 in transfer and maintenance costs required by the previous three-belt installation, at Missabe Mountain pit of Charleston Iron Mining Co. in Minnesota

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[79] Photomicrographs taken from Trans trochem. Soc. 83, 366,367 (1943).

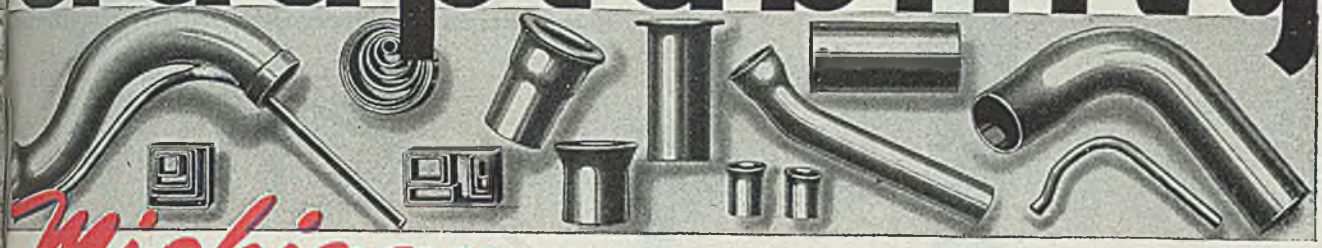
[80] Darsey, Proc. Am. Electroplater (1942).

24 Holes Drilled with Two Working Stations

A machine, developed by Le Tool & Mfg. Co., Dearborn, with two working stations drille holes in a heavy gun part. Sta model No. 20 vertical drilling and ing machine was equipped with spindle drill head and a 3-position draulically actuated shuttle-index on which part was loaded in a fixtur

After being loaded in front pos part was moved into second positi have 20 holes of various diam drilled. Part then was moved to the where 4 more holes were drilled 1 was reamed. Second working st was provided as center distance some holes were extremely close and because a reaming operation was quired on one hole. Bushing plat drill head had a special coolant and partition to allow coolant to directed either to the front or to the working position when machine in operation

Adaptability



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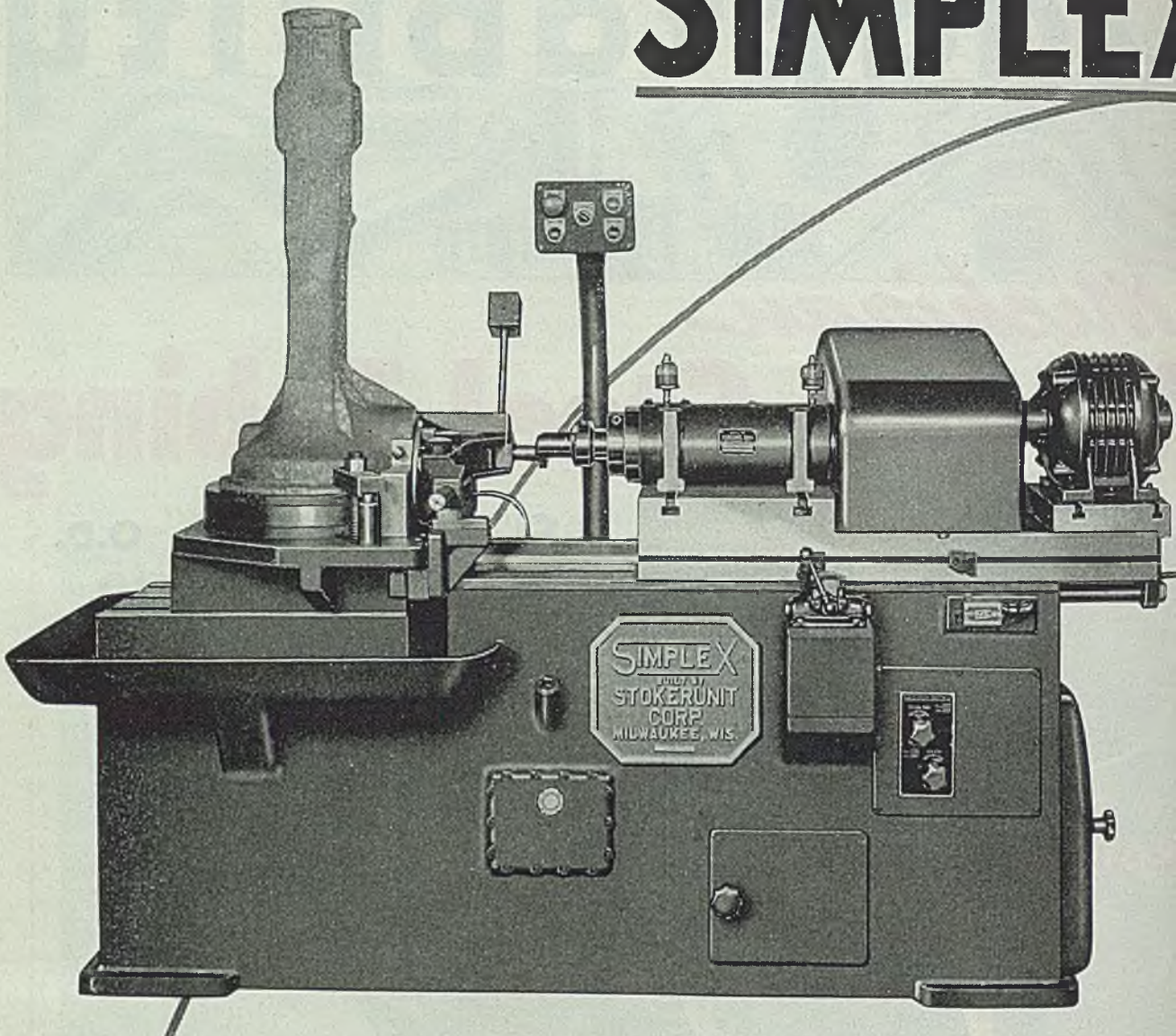

Bulky and awkward pieces are difficult precision boring jobs. Couple this with the necessity of locating from previously machined surfaces and for handling several sizes and types of pieces in the same fixture and you have a boring problem.

This SIMPLEX 2U Single-end Precision Boring Machine was tooled for pinion bearing bores in rear axle sections and it was necessa locate from the differential joint surface the previously finished face on the boss. low base of the machine made it possib use an ample size fixture without raising piece beyond a convenient operating he and a dial indicator type gauge provide give correct reading of the alignment adaptable to all of the several pieces hand

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GIANT BORING BAR

New installation yields accuracy to within 0.0005-in. in boring 13-ft diesel engine frames

RECENT development in precision machining is the installation of a giant boring bar capable of boring 13 ft diesel engine frames within a plus or minus tolerance of 0.0005-in. This boring bar, one of the largest in use, is said to be a potent factor in arresting vibration, reducing engine noise and generally prolonging life and efficiency of diesel engines.

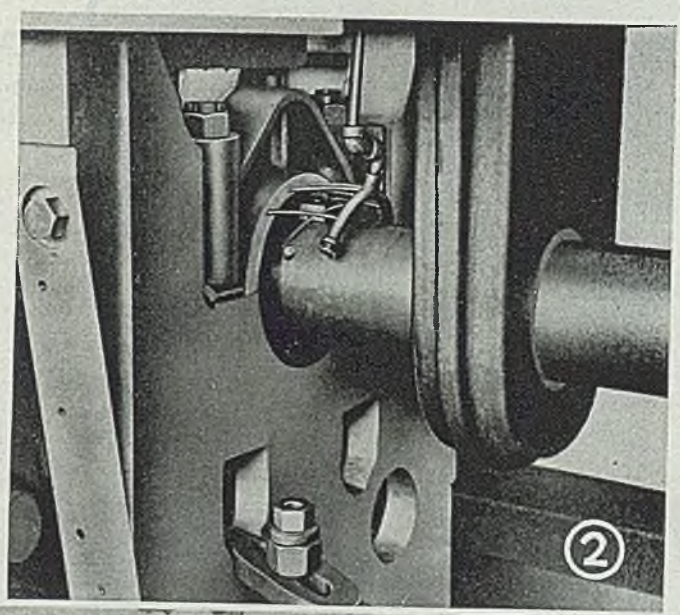
Although a bar of any size can be used on the new borer, it is now doing precision job in the Grove City, Pa. plant of Cooper Bessemer Corp., on engines which call for a hole 8½ in. in diameter through the 13 ft frame.

The borer consists of two principal parts: the driving mechanism and bar, together with the locating support which can be for any size designated. It is operated by one man, whose ability to properly set up the bar is responsible to a great extent for the precision accomplished. At times, a helper is employed to assist in setting up the larger jobs.

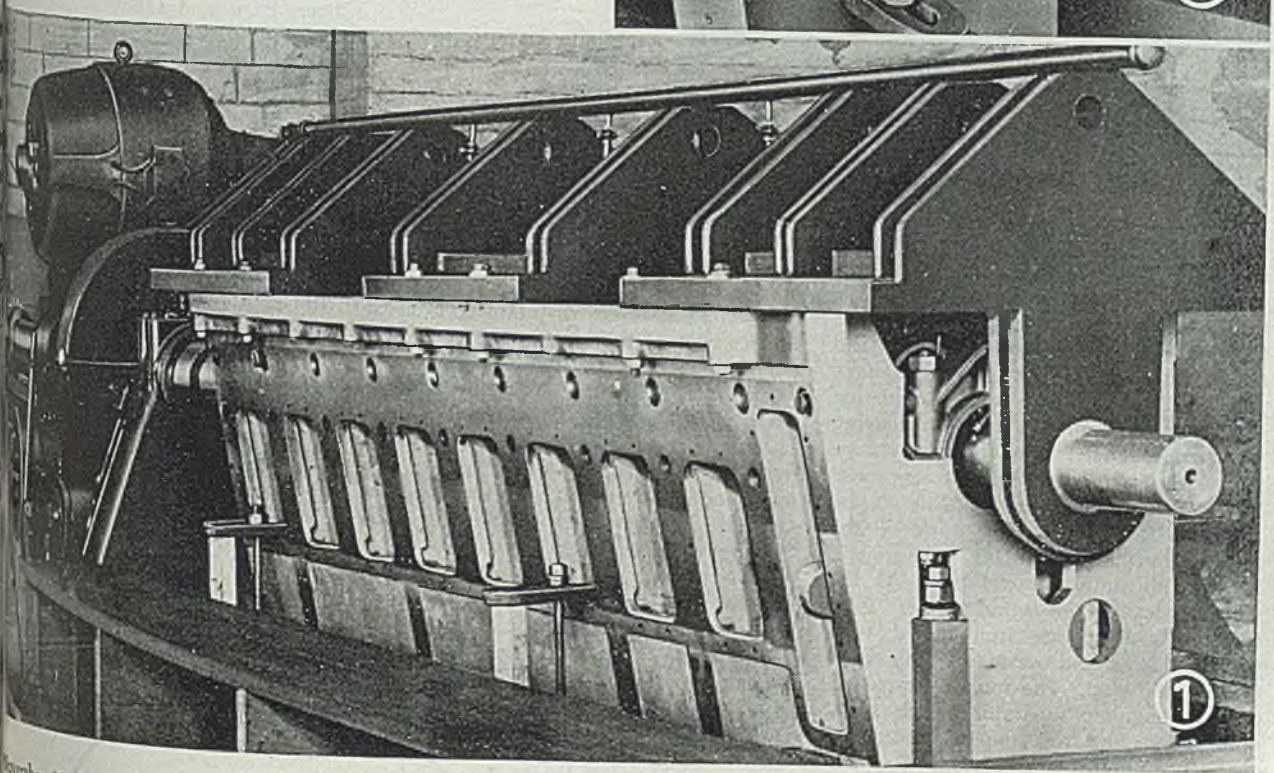
Because of its large size, it operates only horizontally in boring larger engines. Separate bars are made for each engine and are clamped to the engine bed and are driven by a floating drive.

The new boring machine came into use when demand for greater accuracy in machining was required for war equipment. Then as now, this method of boring greatly reduces time and skill required for servicing engines in the field, particularly in connection with the inter-changeability of bearings, and it permits carrying of higher loads which in turn reduces overall size of unit. It is largely responsible for increased horsepower in the recent automotive type of engines.

Right — Detail view of boring bar support shows single-point boring tool and piping for distributing cutting oil



Below — View of new boring machine showing mechanism which drives boring bar through engine frames



Producing Sponge Iron

(*Continued from Page* 129)

tion applicable to sponge-iron production in a rotary kiln.

Plant operation consists essentially of heat-treating a mixture of iron ore and coal in the rotary kiln; the carbon of the coal combines with the oxygen of the ore, producing a reduced, or metallic product. Ore and coal are each ground to ⅛-in. size, mixed in desired proportions, and charged to the cold end of the kiln in a continuous flow at 1 ton per hour. As the charge is moved forward by the revolving motion and slope of the kiln, it becomes heated, the temperature increasing as it passes forward through the small-diameter section. On reaching the large-diameter section where heat from a gas burner is at a maximum (950 to 1000° C), the rate of forward movement of the charge is retarded and the layer of charge is deeper, thus providing conditions of time and temperature for chemical actions to take place that are necessary for the reduction of iron oxide to sponge iron. On leaving the large-diameter section, the charge passes through a grating into a spiral cooler mounted on the outside of the large section of the kiln to cool the sponge iron in a reducing atmosphere, thereby preventing reoxidation. As the material leaves the spiral cooler, it is composed of sponge iron mixed with unburned coal and waste minerals from the ore and coal. The mixture is passed over a magnetic separator which separates the sponge iron from the unburned coal. The sponge iron is cleaned of adhering particles of impurities by treatment in a roll crusher, a centrifugal polisher, and a final magnetic separator. The cleaned product is a granular sponge iron that can be briquetted or used in the granular state for making steel. The unburned coal is returned to the beginning of the circuit and reused.

Success of the operation depends largely on the conditions maintained in the large-diameter section or reducing zone of the kiln. The temperature, rate of feed, ratio of coal to ore in the kiln feed, quality of ore and coal, air introduction, and draft all influence operating conditions, and these factors must be kept balanced to obtain optimum results. When out of balance, operating conditions are upset, with the result that the charge in the kiln becomes semi-fused and sticks to the kiln lining in the form of rings or discharges from the kiln in an unfinished state. When optimum conditions are maintained, at least 90 per cent of the iron in the ore is reduced to metallic iron without difficulty.

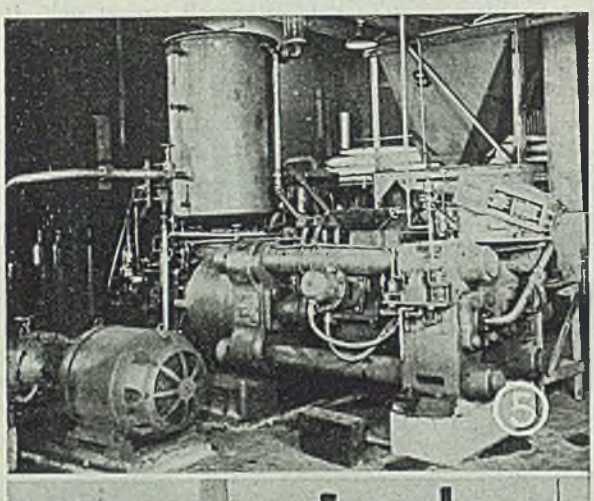


Fig. 5—Hydraulically-operated press which is employed for making briquettes

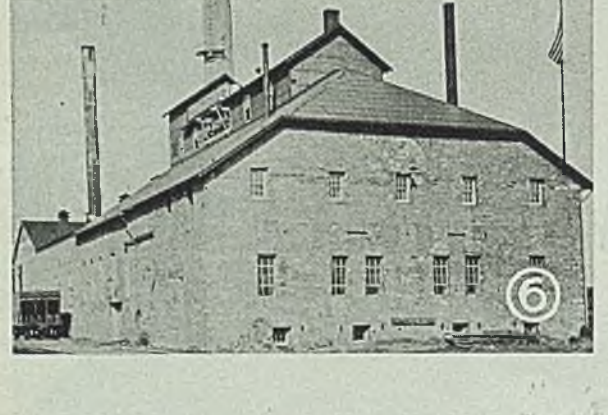


Fig. 6 — Southwest view of main building of Laramie sponge iron pilot plant

Iron ore (hematite) from the Sunrise mine near Guernsey, Wyo., and a subbituminous coal from Hanna, Wyo., were used for the first tests in the plant. The coal contained a high percentage of volatile carbon which interfered with the operation of the kiln, so a preliminary treatment eliminating most of the volatile carbon was put into practice whereby a char was made and used as a reducing agent with the ore. The iron ore was readily reduced to sponge iron, but the waste minerals of the ore were so intimately mixed with the sponge iron that separation was difficult and incomplete. Operation of the rota therefore was varied and condu higher temperatures with the that the sponge iron formed into and nodules which were disc quenched, and cleaned of slag b bling in a barrel. This method eration proved more corrosive kiln lining than lower-temperat eration.

A carload, 54 tons (Fig. 1), of pellets and nodules of sponge i shipped to a nearby steel mill it was substituted for scrap iron charge to an open-hearth furna made into regular commercial s making steel from this iron no advantage or disadvantage was except that an inferior product ing less preparation would have equally as well.

One of the main problems manufacture of sponge iron is th nation of sulphur from the final All iron ores have a small percen sulphur, usually not enough (ov per cent) to be harmful, but occa in amounts large enough to m ore unsuitable for steelmaking. all coals contain various amo sulphur. In making sponge iro coal the tendency is for the iron tain its original sulphur and some from the coal.

Problem Continues Unsolve

Various methods have been tr some success attained in eliminat phur, but the problem has no completely solved. Recent test high-sulphur iron ore from C showed that approximately 75 p of the element could be remo injecting air into the small-diame tion of the kiln and roasting sulphur. Use of various amo limerock in the charge to the k been tried and found to be so effective. Abrasive treatment sponge iron followed by magnet aration removes approximately of the sulphur and waste m While progress has been made i nating a large part of the sulp positive method has been de which gives promise of being ap to all ores and coals.

General practice of charging ture of iron ore and char made fr into one end of the rotary kiln ing with natural gas at the oppos has been varied to a procedure in the ore alone is charged into th end and granular coal is blown i firing end. By blowing a granula heat is supplied from the burn the volatile carbon, while the fix bon or char drops out of the stream to the ore charge and in with it acts as the reducing age produces sponge iron. This meth been tried and proved partly suc and is being experimented with f because of the possibilities of m sponge iron at a low cost. It is esp applicable where low-grade coal

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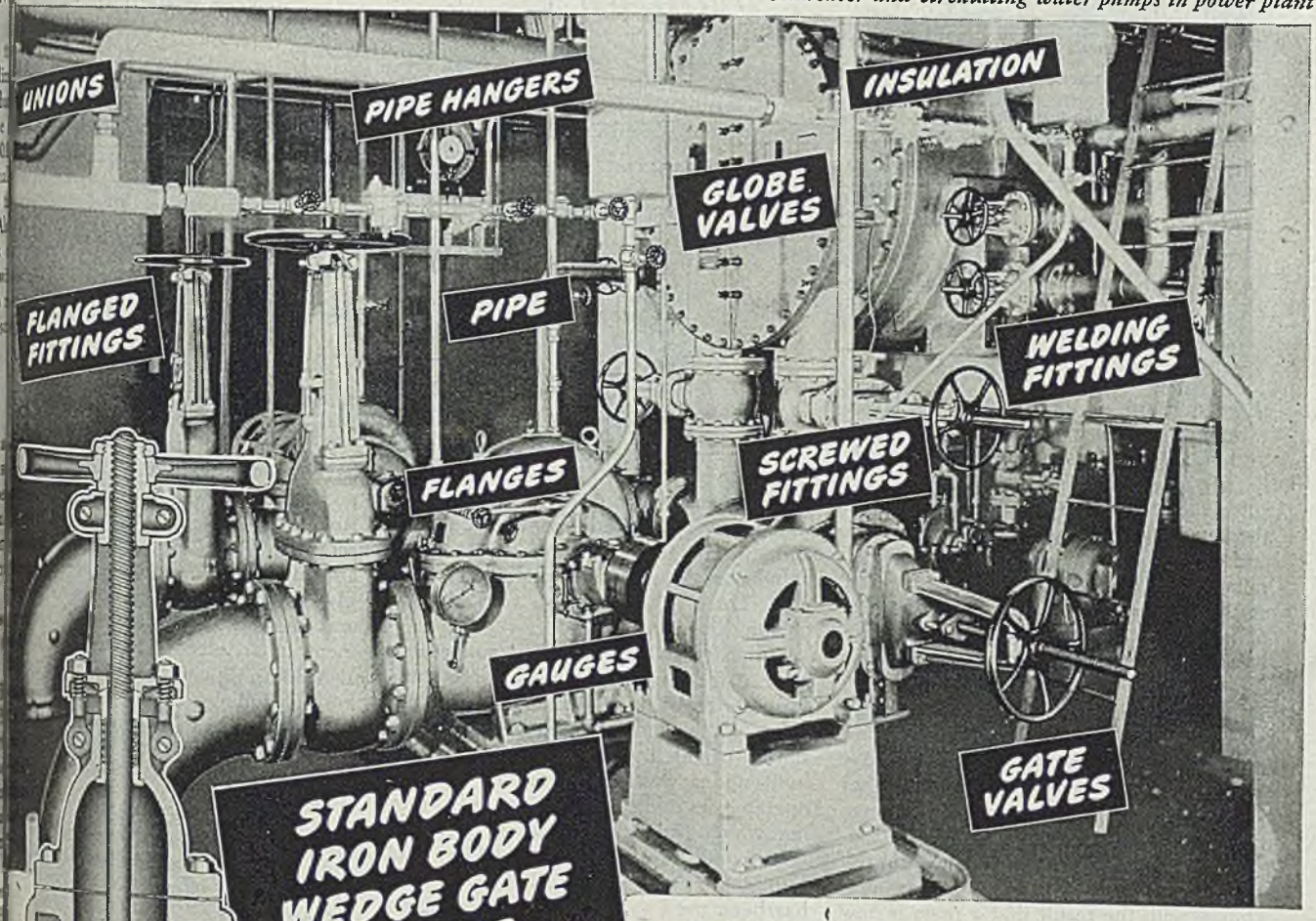
Condenser and circulating water pumps in power plant



SERVICE RECOMMENDATIONS: **Crane Standard Iron Body Wedge Gate Valves** are suited for many services in factories and power plants, at all working pressures up to 125 pounds steam. Brass trimmed valves are recommended for steam, water or oil lines; all-iron valves for oil, gas or fluids that corrode brass but not iron. Made in O. S. & Y. and Non-Rising Stem patterns. See page 101 of your Crane Catalog.

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Size of Valve	Screwed or Flanged End Valves		Hub End Valves
	Saturated Steam	Cold Water, Oil or Gas, Non-Shock	Cold Water or Gas Non-Shock
2 to 12 in.	125 pounds	200 pounds	200 pounds
14 and 16 in.	125 pounds	150 pounds	150 pounds
18 to 24 in.	*	150 pounds	150 pounds

*For steam lines larger than 16 in., Crane 150-Pound Cast Steel Gate Valves are recommended. (For sizes under 2 in., use Crane Clamp Gate Valves.)

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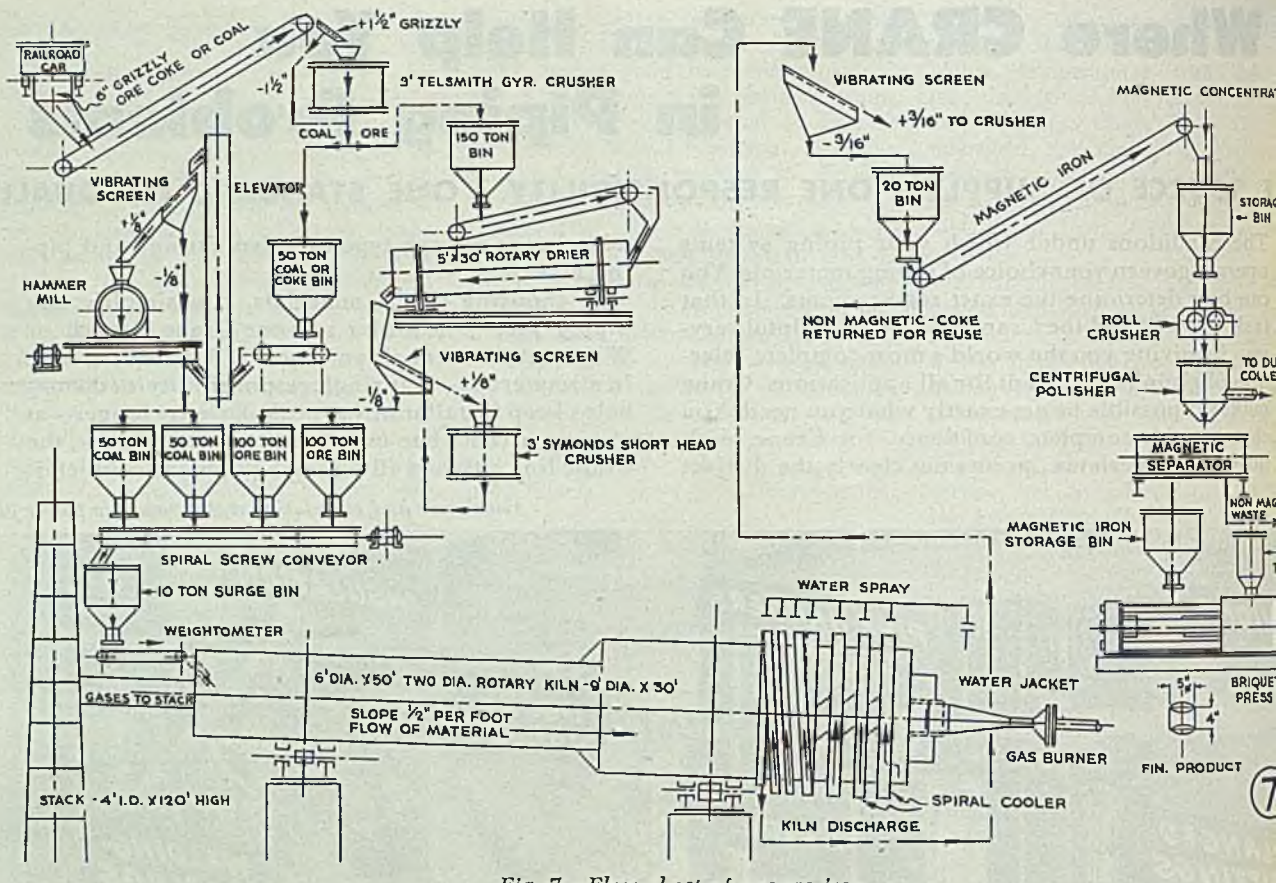


Fig. 7—Flow sheet of sponge iron process used at Laramie, Wyo., pilot plant

abundant and oil or gas not available.

Sponge iron as produced in this plant to date is not a finished product physically nor chemically. Impurities such as silica, carbon and sulphur are higher than permissible in most marketable iron and steel, so a subsequent melting and refining step is necessary. As melting stock for a refining furnace, sponge-iron nodules are more acceptable from the handling viewpoint than the granular type. Since granular sponge iron can be made with less difficulty and can be cleaned more thoroughly than nodules, more of it has been made. In order to have a more acceptable product that is easily handled, the granular sponge iron was pressed into briquettes. Considerable test work was done on briquetting in various types of briquetting machines, with the result that a press is now installed which makes cylindrical briquettes 5 in. diameter, 4 in. high, and weighing approximately 8 lb (Fig. 5). Over 100 tons of briquetted sponge iron have been made in preparation for melting in an electric refining furnace. Some of these briquettes have been made into a good grade of electric furnace steel.

Employes at the plant consist of six clerical and technical people, three watchmen, six skilled maintenance men, and an operating crew of 16 laborers, helpers, and operators, totaling 31 people. Three 8-hr shifts are worked most of the time.

Summary: The Laramie sponge iron pilot plant, consisting of a large two-diameter rotary kiln with auxiliary equipment, is a complete flexible operation station of the Bureau of Mines. It was built under wartime conditions and has operated periodically over a year, during which time a series of 35 tests has been conducted in the rotary kiln. Information from previous small-scale work has been used as a guide, but the larger scale of these operations has introduced new problems currently under investigation.

Experimental work has been confined to establishing and maintaining conditions within the rotary kiln whereby a continuous operation yielding a high grade product can be demonstrated and applied generally to any iron or coal.

Both nodular and granular sponge have been produced. A carload of nodular type was shipped to a steel mill, where it was substituted scrap iron in the open-hearth charge and made into commercial steel. A supply of granular sponge iron was produced and briquetted in preparation for shipment to an electric furnace plant.

Accomplishments of the plant to date are as follows:

1. Considerable information has been gained on the use and limitations of the rotary kiln in the manufacture of sponge iron.

2. The method of charging ore at one end of a rotary kiln and burning fuel for heat and reduction into the opposite end offers greatest possibilities for low costs.

3. A large part of the impurities in granular sponge iron can be removed by an abrasive polishing treatment, a step heretofore not known to have been practiced.

Editor's Note: Other important articles on sponge iron were presented in STEEL, April 16, 1945, page 106; and June 25, 1945, page

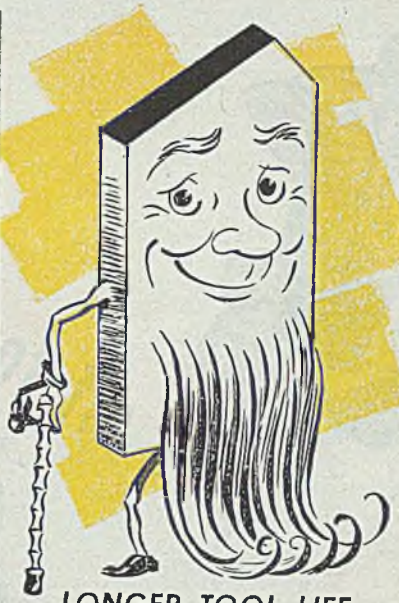
Uranium Metals as Source Of Atomic Bomb Power

Uranium and Atomic Power, by Jack De Ment and H. C. Dake; cloth, 342 pages, 5½ x 8½ inches; published by Chemical Publishing Co. Inc., 26 Court St., Brooklyn 2, New York, for $4.

This is the second edition of this work, made timely by success of the atomic bomb. It is a clearly written, practical book to give the layman, student and chemist all the information essential to an understanding of atomic power and the atomic bomb. Two chapters are devoted to occurrence and properties of uranium minerals and two others to their qualitative and quantitative analysis. The remaining chapters discuss the chemistry and physics of uranium and specific methods in uranometry. There is a new section on the atomic bomb.

The first edition was issued in 1939 and in the 6 years intervening of the prophecies as to atomic have come true. The authors believe that a work on uranium, from the point of atomic energy, would serve integrate essential facts for the physicists and engineers who might called on to engage in accelerated for an atomic explosive and with end in view the book was originally written. Thus, both the interests of scientists and lay public are served.

WHY IT PAYS TO USE THE *RIGHT* CUTTING OIL



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War production procedure pays off for peacetime products, too

IT'S not the volume of war materiel ordered that wins battles—it's the volume delivered. And American Industry's record in getting the guns and tanks and ships and other implements of war out to the firing line when they were needed is conclusive proof of the effectiveness of the policy of allotting parts-production to sub-contractors.

Speed is equally important in the race for peacetime markets. That's why so many of America's largest manufacturers recognize the advantages of allotting their parts-production to outside sources. In addition to providing a short-cut to waiting customers, added advantages are lower capital investment, fewer labor problems, specialized workmanship.

The Joyce Machine Company has long specialized in the quantity production of machined metal parts and assemblies. Joyce is equipped to handle the production of parts of any type, any size, a quantity, for any field of industry.

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STEE

COLD Riveting

FOR MAXIMUM STRENGTH

Superior physical characteristics and lowered costs attained through elimination of heating

Fig. 1—Hole completely filled by expansion of shank of 7/8-in., 6-in. grip rivet

Fig. 2—Girder fabricated entirely by cold riveting at Fort Pitt Bridge Works

ENGINEERING advantages resulting from driving large rivets cold have been recog- for a number of years by many engineers and fabricators. In this process it is desir- to limit and automatically control the driving pressures. This affords an opportunity prevent over-driving which otherwise might cause warpage and require straightening.

Control of the speed of the riveter is also important, so that small rivets can be success- driven with smooth action of riveter without ejecting rivet from the hole before it is en.

Use of standard structural grades of rivet steel is satisfactory, and eliminates need of ial rivets which would duplicate stocks and cause confusion in the shop.

Driving large rivets cold increases tensile strength somewhat and yield point greatly that of the undriven rivet. Reduction of area and elongation are reduced to some degree still are in excess of requirements for structural material in which the rivets are driven. companying table shows change in physicals of ASTM-141 steel rivet 7/8-in. size, cold driven er pressure of 66 tons. See Fig. 3.

By accurately controlling pressure, rivets of small diameter can be safely driven on large ers without damaging the rivet or structure—i.e., 5/8-in. rivets requiring approximately tons to drive cold can be satisfactorily driven on an 80-ton machine by controlling the ssures accurately and automatically.

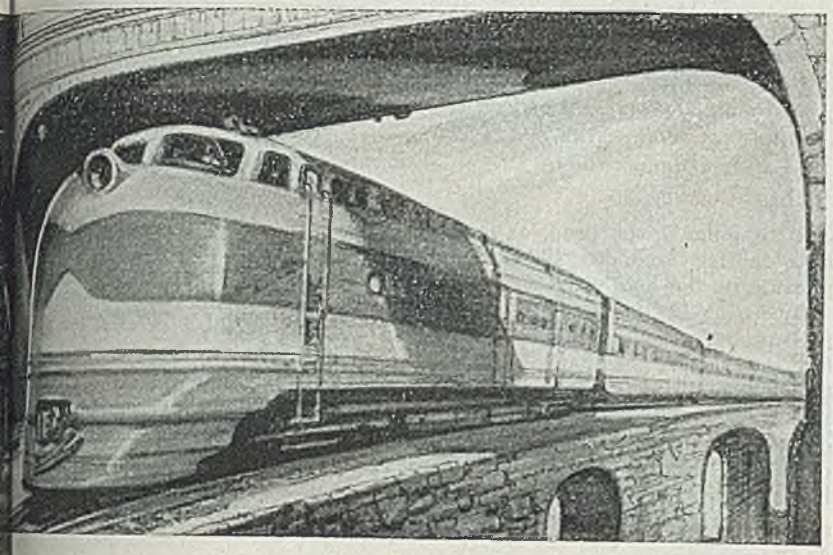
Shank metal is elastic up to its elastic limit which allows driving pressure to be trans- ted through entire length of rivet shank, resulting in uniform upsetting and completely ed holes. When unit driving pressure reaches the elastic limit of the metal in the shank, will begin to swell, and as pressure builds up, the shank metal flows diametrically until re- icted by the wall of the holes. Metal outside the hole will continue to flow unrestricted

Fig. 3—This 7/8-in. rivet of ASTM-41 steel was cold driven at 66 tons pressure

AT A COAL TIPPLE

J&L Otiscoloy steel gives greater strength with less weight to cars, coal chutes and loading equipment

DRAWN FOR JONES & LAUGHLIN STEEL CORPORATION BY ORISON MACPHERSON



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In the large and diversified family of J&L controlled quality steels, Otiscoloy is the low-alloy, high-tensile member that serves widely and well where reduction in structural weight, without loss of strength, is a factor.

A field in which this is highly advantageous is transportation where unnecessary deadweight is a constant charge against revenues and where its reduction is reflected in increased payloads.

On account of its greater strength and lighter weight, Otiscoloy reduces deadweight by 25%. It also lengthens the life of equipment from four to six times by its resistance to atmospheric corrosion and by its greater resistance to abrasion. To the manufacturer of transportation equipment, Otiscoloy steel offers an easily workable material, for it can be readily formed, either hot or cold, on present-day presses and has excellent weldability.

For all ingenious engineers and fabricators, Otiscoloy is a spark to the imagination, a spur to the conversion of blue prints into new products of steel that are strong, light and lasting.

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J&L STEEL

IGHTER, STRONGER, CONTROLLED QUALITY STEELS

LIGHT & STRONG

Steel freight cars and passenger cars are now being built by thousands. Many will be constructed of Otiscoloy, a special, lightweight steel developed by J&L that has great strength, workability, weldability, and assures gains in the payload up to 25%.

Otiscoloy (pronounced O-*tis*-co-loy) was developed in and named for J&L's Otis Works, Cleveland. This special steel is also produced in other J&L works as continuous sheets and as bars of varied forms.

Coal still king on R.R.'s as biggest, cheapest source of primary energy for locomotive power. Through Bituminous Coal Research, Inc., several big rail carriers are conducting research toward development of (a) gas turbine locomotive using coal as basic fuel, and (b) high-powered steam turbine-electric locomotive, burning coal.

When you compare watches with train conductor, his is correct, for it must be kept within 30-second variation per week.

"Riding the gravy train," an expression that may lack elegance, aptly describes the gain in revenues enjoyed in the operation of trains made up of equipment fabricated from Otiscoloy, the J&L high-tensile steel that reduces deadweight by 25%. In an average hopper car the saving Otiscoloy affords gives a net gain in the payload of 11,000 pounds, or 5½ tons. In a 100-car train, this amounts to some 550 tons, which is quite a ladleful of "gravy" in revenue.

R.R.'s carry 72% of ton-miles handled by all carriers, including water, motor, pipe line and air.

Europe needs million freight cars, American army transportation experts estimate, many thousands of which will be constructed of light, strong, high-tensile American steels.

"T"-rail, hook-head spike, fish plate were invented in 1830's by Robert L., son of John Stevens, builder of 1st U. S. locomotive.

½ ton more pay freight can be hauled when you operate a large truck made from Otiscoloy, for this is the average saving afforded by this J&L high-strength steel.

Brake wheel frames on every great bomber in our huge sky fleet and on many other of our fighting aircraft, were made of Otiscoloy, to save weight and add strength.

When bumpers were just leaf springs, their simple shape made processing easy. They were hot formed, ground and polished, then plated. However, the hot forming process became complicated when deeper, more intricate bumpers with end extensions were made. The spring steel distorted noticeably on cooling, requiring more grinding and hand work before plating. As a result, companies designing cars with heavier bumpers began to look around for stronger, lighter, more workable steel, such as Otiscoloy, and the trend toward high-tensile steels for this use seems assured.

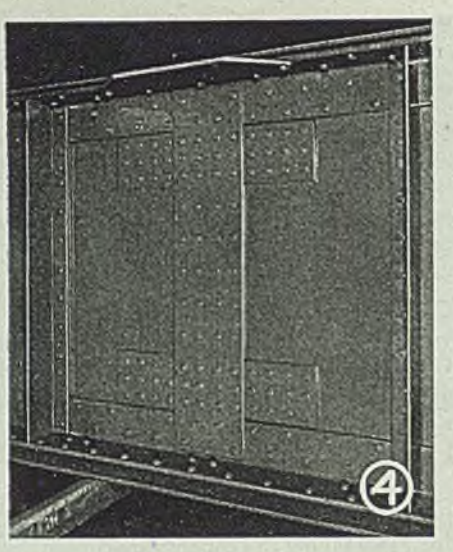


Fig. 4—Detail of same girder as in Fig. 2 showing flat and button-head rivets employed. All photos and data courtesy of American Institute of Bolt, Nut, and Rivet Manufacturers

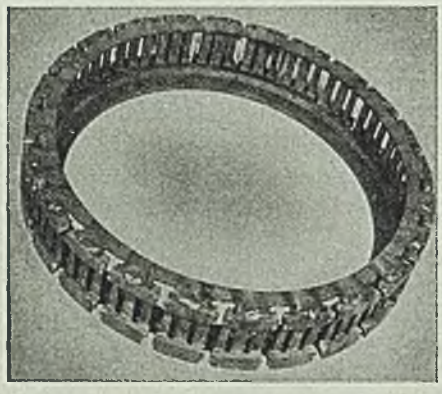
PHYSICALS OF ⅞-IN. RIVET	As Rolled	Cold Driv
Tensile Strength, psi	57,000	68,000
Elastic Strength, psi	34,000	57,000
Reduction of Area, %	71	67.1
Elongation, %	42	29.3

and form the driven head, at the same time causing expanded shank to exert pressure on the hole wall.

Rivets cold driven under controlled pressure have no perceptible temperature shrinkage of the shank, either longitudinally or diametrically. They are in true shear and bearing, and do not become loose or leak from vibrating loads or shock; severe strains will not cause looseness, as holes are completely filled.

Caulking of cold-driven rivets against leaks is not necessary as rivet complet fills the hole, and the countersinking fect around the hole's top edge form perfect seal. Holes in unusually long g are as well filled as short ones, and quire no greater pressures to drive.

Manufactured heads may be button standard flat. Driven heads should flat and of standard dimensions, so as develop ultimate strength of the r shank. All rivets used for cold driv must be in annealed state.



Increased Resistance To Wear Achieved by

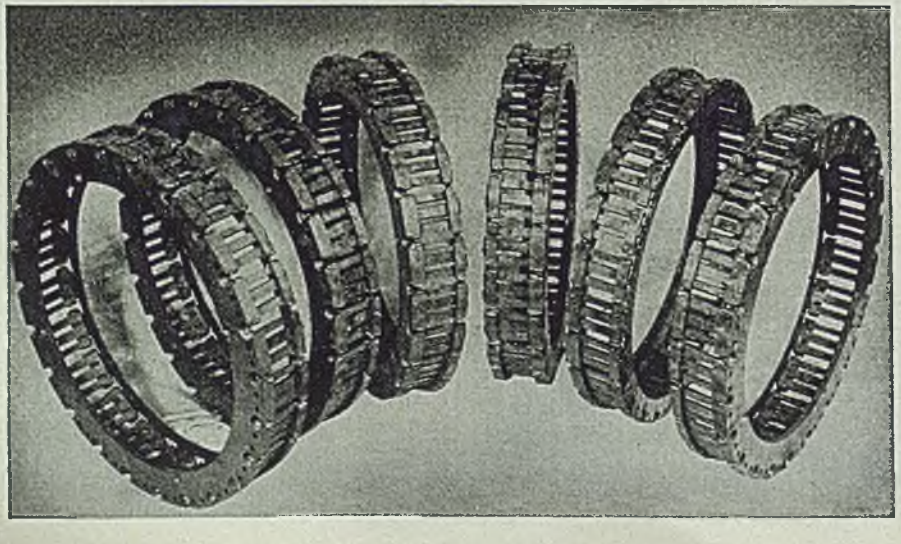
Hard Facing

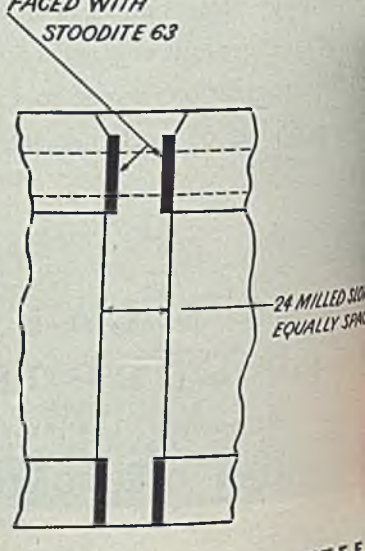
FABRICATION of the inspection cages (machined from steel forgings and hard faced at points of wear), shown at left below, involved an interesting application of hard facing. Each of the cages will hold 24 cylindrical parts for inspection.

The body of the cage is made from a forged ring 17¾-in. OD, 13-in. ID and 3 1/5-in. thick. This ring is machined to the shape shown in center photo at left, a top view showing shape of cage, and points of application of hard facing. It provides 24 equally spaced slots reamed on the top portion, and drilled below. These openings receive the parts to be inspected. It is important to preserve the dimensions of these openings by preventing wear. Therefore, a hard facing operation was prescribed for the areas indicated by the heavy shading in diagram at r below, a sketch of a section of the s The heavy area indicates the location hard facing deposits.

The hard facing was done w Stoodite No. 63, applied by gas weld This alloy flows freely and forms smooth deposit which is extremely w resistant, which characteristic de mined its suitability for the partic purpose of maintaining the correct mensions. The bottom of the cage formed by welding on an annular cut to the shape shown top photo left, a bottom view after the stiffen ring has been welded in place. The sult of this construction is an insp tion tool which made it possible to ch dimensions of small parts very rapi

Welding equipment used was made C. E. Phillips & Co.,Detroit 8.



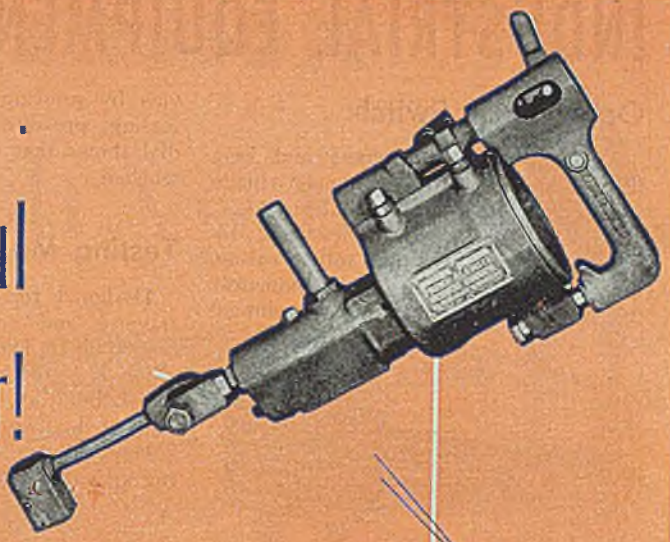


STEE

magnesium made it possible . . .

bigger, more powerful

—yet 18% lighter!



He was up against a real problem, the manufacturer of this locomotive grease gun! His product needed more power, strength, size. But any additional weight would have been a prohibitive penalty. Magnesium licked the problem—and brought the weight *down* 18%!

It's a product story that illustrates the kind of weight-saving job—often with *added strength*—that magnesium is doing today for many products, in both consumer and industrial fields.

Here's what The Prime Manufacturing Company, the producer, has to say:

"We now have a cylinder body much larger than the old style . . . able to develop 17,000 pounds pressure per square inch at the bearing.

"We use not only a magnesium cylinder body but a magnesium cylinder body cap and a magnesium handle. The total weight of the enlarged grease gun is now twenty-six pounds—six pounds lighter . . ."

Ready . . . to make products move!

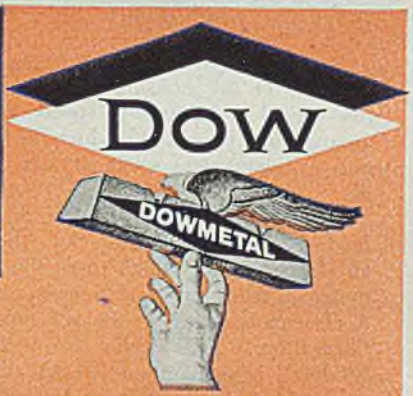
MAGNESIUM

LIGHTEST OF ALL STRUCTURAL METALS

…gnesium production, from both …n wells and sea water, is …ndant. Dow is the pioneer and …vanced producer in the field.

Established fabrication techniques, backed by 29 years of Dow experience, are used by plants throughout the nation.

All common forms, such as the die castings shown here, are standard production items in the fabrication of magnesium parts and products.



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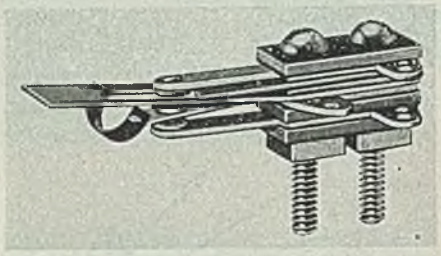
INDUSTRIAL EQUIPMENT

Open Blade Switch

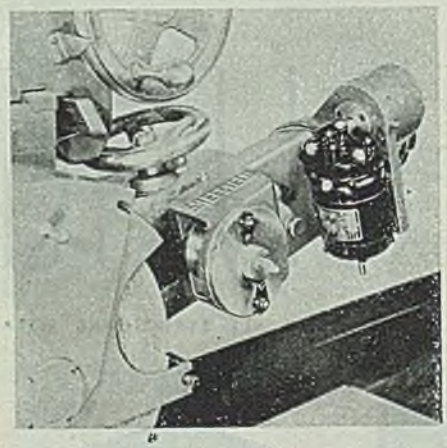
Designed for compactness and long life, a small single pole open blade switch is offered by Acro Electric Co., 1323 Superior avenue, Cleveland 14. Engineered with beryllium rolling spring, the overall dimensions are approximately 2½ x 10/16 x ⅝-in. Contact arrange-



ments are for normally open, normally closed or double throw circuits. Being an open blade switch, the means of actuation is provided by the user. Standard operating pressure at end of the blade is 3 to 6 oz and it is rated at 15 amp, 115 v ac.

Dressing Device

Sheffield Corp., Dayton, O. offers a powered crush dressing device for use with model B Thompson surface grinder. It is mounted on the wheel head slide. A 1/3 hp gear head motor is directly coupled to a grinding wheel spindle at

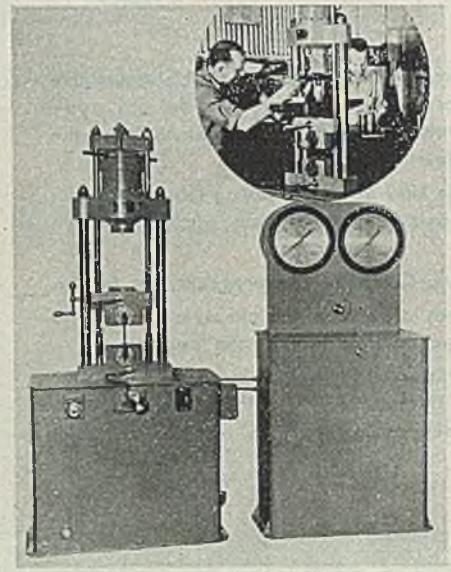


the rear of the housing and this drives the wheel at crushing speed through an overrunning clutch, which is thrown out of engagement when actually grinding.

One of the features of this device is feeding the crusher into the wheel by an electric motor which turns the micrometer in-feed screw at a constant rate. A closeup is shown in the accompanying illustration. Two styles are available: Model B is semiautomatic with the feed dial indicator present for a desired depth of automatic in-feed of the crusher roll; with model A the operator controls device by pressing a pushbutton and releasing pressure when feed indicator dial shows that desired depth has been reached.

Testing Machine

Designed for the making of tensile, traverse and compression tests up to 60,000 lb, a hydraulically operated machine is introduced by Steel City Testing Laboratory, 8843 Livernois avenue, Detroit 4. The piston and cylinder are a lapped finish, fitted without any packing and allowing for a minimum of fric-

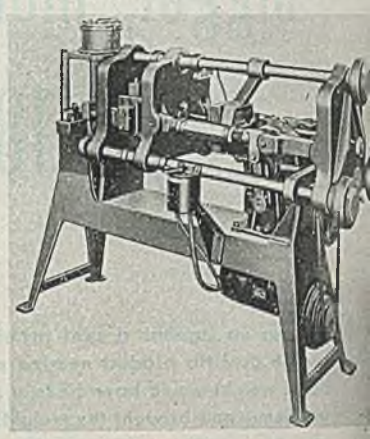


tion. Pulling head unit thrust is taken on a large steel ball and socket which allows head to float. Upper and lower pulling heads are of conventional type with wedge type jaws for both flat and round specimens. Holders are also available for shoulder and thread end specimens. A suitable load regulating valve is provided which will maintain a uniform load rating. Gages are provided with maximum pointers and are fully protected against overload. A maximum stroke of 6 in. is provided in the cylinder; traverse table has a maximum span of 30 in.

Die Casting Machine

A new die casting machine for the production of small zinc, tin and lead alloys has been introduced by Light Metal Machinery Inc., 607 Ariel building, Erie, Pa. Its casting cycle is completely automatic with die movement, injection and ejection all actuated by one mechanism. The four operating speeds, 266, 400, 639 and 882 shots per hour, are predetermined by size and weight of casting being made and maintained with virtually no variance in continuous, 24-hr day production. Small, light-weight dies a easily installed and removed, reducin die-change time.

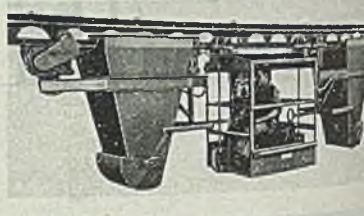
The unit operates with either air hydraulic pressure on the injecti plunger. On the standard model, plung



diameter is 2 in., stroke is 4 in., s capacity is 18 oz, casting area is 30 in. and injection pressure is 1000 p an air cylinder is used, or 2000 psi w a hydraulic cylinder. Other plun sizes are available. The machine is long, 21 in. wide, 4 ft 6 in. high, weighs 3000 lb.

Bucket Carrier

For transportation of dry bulk terials, a new motor-driven cab opera double bucket carrier has been develo by Cleveland Tramrail Division of Cle land Crane & Engineering Co., Wickli O. Operation of carrier and oper and closing of the bucket gates are ha led by cab operator who sits on su



chair which enables him to work in direction of either bucket. A single able speed drum controller is located one side of the cab, but two foot bra are provided, one at either end so one is always in convenient reach of operator regardless of which direc he is operating the carrier. Push-p levers for opening bucket gates ext into cab and permit emptying mate in any amounts and at any rate desire

Unit shown here has two 25 cu buckets and is designed for carrying total load of 2 tons. Other sizes available. Buckets are designed and cated with reference to the tramrail beam rail so that they may be fi

All claims are those of the manufacturer of the equipment being described.

Rush **RECONVERSION** . . . but watch your step, too!

SIMPLIFY STOCK CONTROL WITH KARDEX

...r Kardex Visible ...d Record has paid ...elf many times over ...ing us complete control ...purchases, costs and turn- ...e of thousands of items."

...H. Doucater, Vice-President, ...ers Bros. Lumber Co., Tampa, Fla.

...day's swift-changing economic ...ather has made the scientific bal- ...ng of stocks more vital than ... With its ingenious Graph-A- ...ic computing chart, Kardex ...es a revolutionary simplicity to ...h task. It establishes constant pro- ...tion against the dangers of over- ...cks and understocks and mini- ...izes serious reconversion hazards ... making procurement dovetail ...h requirements.

Kardex "pictures" the conditions you need to know. With Graph-A-Matic signal control, stock status is charted *visibly* for decisions without computation or item-by-item analysis. You get complete and current facts instantly . . . balances, vendors, purchase history and follow-up needs . . . and according to leading users, operating costs are as much as 50 per cent *less*!

Ask our nearest Office about the Graph-A-Matic Computing Chart.

SYSTEMS DIVISION

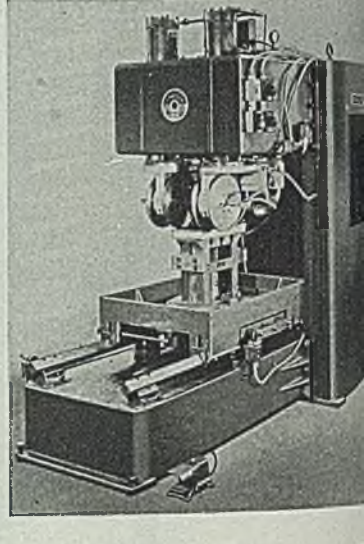
REMINGTON RAND

315 Fourth Avenue, New York 10, N. Y.

from overhead bins without interferenc
or spillage. Carrier is provided with tw
motorized travel drives, one at each en
and operates at speeds up to 600 fpm.

Seam Welders

Duplex seam welders, designed f
simultaneous seam welding of two
more parallel seams on one surface
announced by Progressive Welder C
3050 East Outer drive, Detroit 12. T
machines are available in a wide ran
of capacities and sizes, are air operat
and fully automatic. A duplex head
the machine accommodates either t
or four welding wheels. On the mo
shown in the accompanying photogra
two seam welding wheels are provi
on each of the two welding heads. Ou
wheels are of larger diameter to p
vide clearance for four inner whe
while outside wheels are used for we

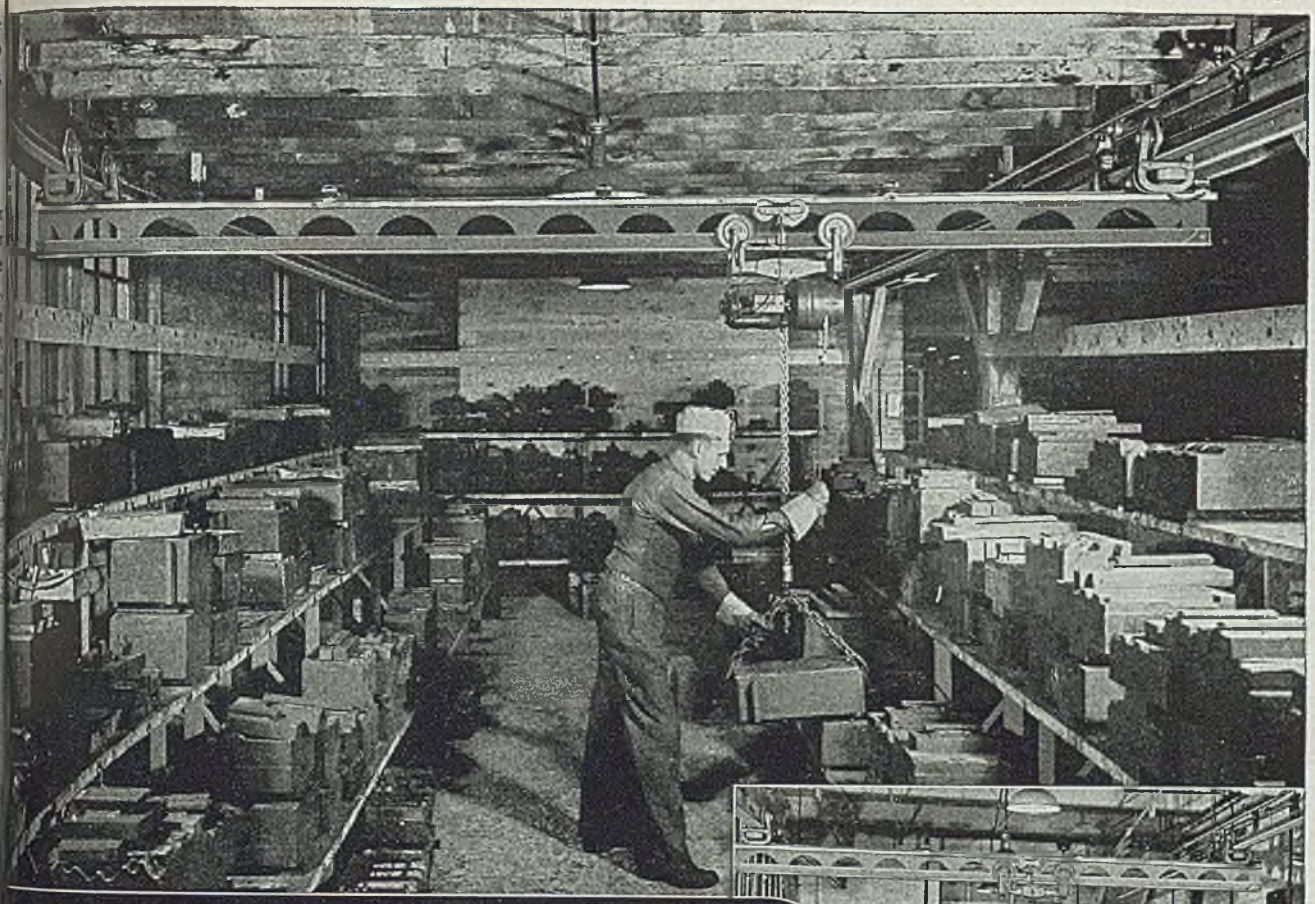


ing. All wheels are free rotating. T
are driven by contact with moving w
under welding pressure.

Work itself is carried on a work t
mounted on horizontal slide rails.
of work holding fixture is formed b
flat copper plate which provides lo
path for welding current between w
ing wheels, thus platen top beco
lower electrode for both wheels. W
ing wheels, lower electrode, wel
transformer, etc., are all water coo
A deep coolant trough is integral w
moving work table.

Entire assembly moves in and
of machine as welding operation
ceeds. Operation of movable t
is by air cylinder connected with
draulic cylinders acting as dash
to insure uniformly smooth table tra
Speed of work table has a wide st
less adjustment range from 0 to 30
at usual factory air line pressures. Li
switches engage dogs on the work ta
to automatically control table tra
fixture indexing and start of weld
cycle on both "in" and "out" strokes

The units are available with tra
former capacities up to 500 kva; a w
range of work table sizes and trav
and many combinations of weld



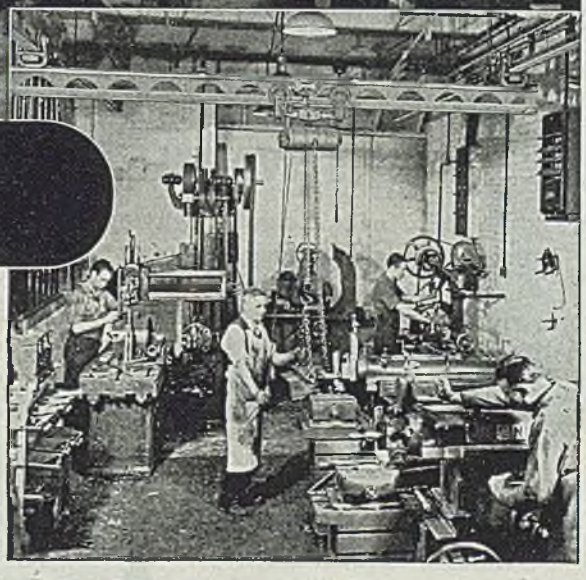
. . . *Inexpensive Cranes* SAVE VALUABLE TIME!

ELECTRIC HOISTS *do the* HEAVY WORK

Easy rolling hand-propelled cranes with electric hoists can save time of skilled workers and promote efficiency in dozens of places. Such cranes often pay for themselves within a few months.

The Fairmount Tool & Forging Co., Cleveland, make good use of these cranes. One in the tool and die department cuts lost production time for both skilled workers and machines. This means greater output and lower costs.

Another crane in the die storage department makes possible an efficient die-storage scheme that should prove advantageous to many others. The die storage room has been provided with shelves on which the dies are stored in step fashion in numbered positions. Thus any die can be picked up or set in place without disturbing other dies. Locations of dies are quickly found by means of an index.



Above: Heavy dies are easily handled in this efficient die storage room. The electric hoist does the hard lifting. A gentle push moves the crane to any point on the runway.

Below: These valuable men spend less time handling materials and more time with actual production because of the help of this inexpensive Cleveland Tramrail crane.

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CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
1125 EAST 283RD ST. WICKLIFFE, OHIO.

CLEVELAND TRAMRAIL

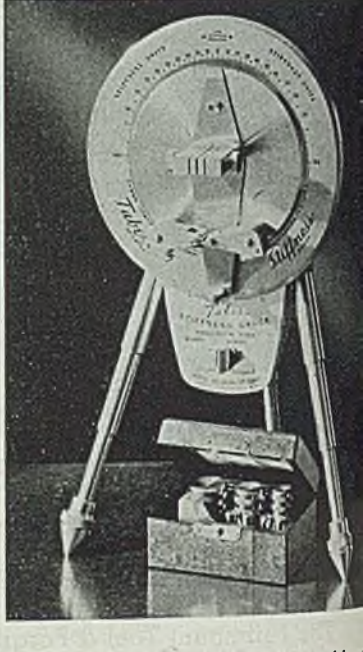
OVERHEAD MATERIALS HANDLING EQUIPMENT

wheel diameters and spacings. Co ventional timing and sequence contro are used. Stroke of the head is a justable.

Stiffness Gage

For determining standard measur ments of the stiffness and resilient qua ties of flexible materials up to ⅛- in thickness, such as laminated plast cardboard, light metallic sheet and wi a new V-5 power driven stiffness ga is announced by Taber Instrument Cor 111 Goundry street, North Tonawan N. Y. Without the addition of attac ment, the instrument will measure b initial and normal stiffness characte tics, also elastic or "creep" of spe men structure can be charted fro various readings.

Calibrated weighing system is of p dulum type. Entire pendulum assem



with the exception of the calibra weight is made of strong aluminum al keeping inertia and bearing friction a minimum. Face of specimen clamp mounted exactly on center of rotation suring constant test length of specim A set of calibrated weights are provi with the instrument consisting one e calibrated in 500, 1000 and 2000 s ness units. Weights of 3000 and 5 units are also available.

Instrument is portable, weighs 15 and can be plugged into any 115 v, cycle circuit in the laboratory or pl

Die Separator

Lyon-Raymond Corp., 2327 Madi street, Greene, N. Y., announces a n die separator as an optional feature their portable hydraulic elevating ta It consists of a tubular superstructu which fastens to the base of the ta by four bolts with wing nuts. Dies separated by elevating table top, fast ing top section of die to superstructu

No. 12 of a Series: "Looking at the FIVE ESSENTIAL THINGS you never see in ELECTRODES!"

Extruding an electric-furnace electrode. Sixty years of experience, guided by continuing research, enables National Carbon Company to make electrodes of unmatched quality.

MATCHING STRIDES WITH STEELMAKERS

Under the stimulus of war, the steel industry has developed new techniques to attain new highs in efficiency. The industry is thus better equipped to meet the challenge of the days to come.

Matching strides with the steelmakers, National Carbon Company, Inc. . . . through continuing research . . . also successfully rose to meet this great crisis. Carbon and graphite electrodes performed as never before.

And now in the days to come, continuing research—one of the "five essential things you never see" in electrode-manufacture*—will continue to help us to parallel the progress of steel by turning out ever stronger, more uniform electrodes.

• • •

*These "five essential things you never see" in electrodes are: selection of raw materials, manufacturing experience, manufacturing control, continuing research, and customer service. They are a part of every "National" and "Acheson" electrode. We shall be glad to explain in detail how they can be of distinct advantage to you.

NATIONAL CARBON

ACHESON GRAPHITE

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Unit of Union Carbide and Carbon Corporation

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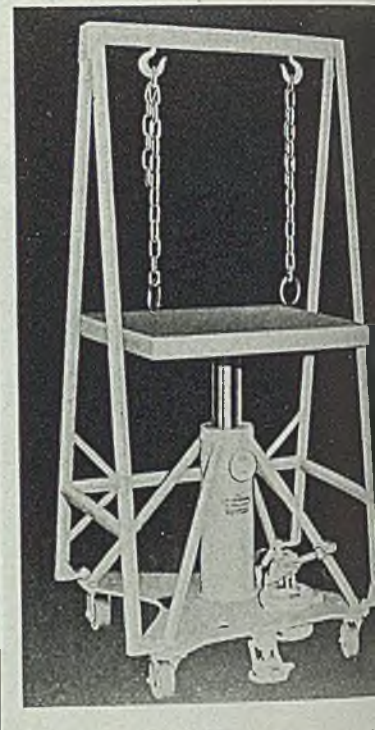
DIVISION SALES OFFICES: Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco

In Canada: Canadian National Carbon Company Limited, Toronto 4, Canada

by chains, then lowering table top wi
bottom section of die.

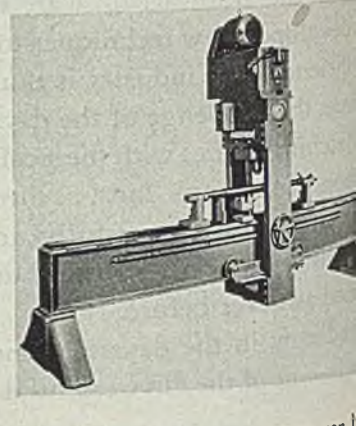
Being demountable, the die separat
does not limit use of table which may
made available for such work as tra
ferring of dies in and out of presses, su



port of overhanging materials, an ad
able height assembly bench and the
handling and work positioning task
which it was designed.

Hydraulic Press

To facilitate the loading of heavy
in straightening presses, Anderson
Mfg. Co., 1907 Kishwaukee street, R
ford, Ill., has developed a new p
hydraulic press. With the traveling



at one end of the press, crane can
heavy work into place on the ma
and then ram can be placed over
wherever required. Ram rolls on
ball bearing equipped wheels. Tab
equipped with V-slide on which
mounted spring loaded centers
checking rolls.

Indicator tells the operator
amount of runout; where to stop
do straightening; during the pre
operation, it tells how much ope

STE

For you NOW

Three new members of the RACO family . . .

RACO 8010 • RACO 9010 • RACO 10010

These are heavily coated all-position, reverse polarity electrodes for welding special high-tensile low alloy steels. Though new on the market their high quality is assured through our searching laboratory tests, and demonstrated on hundreds of practical jobs in shop and factory. When critical metals may be had for civilian goods, these electrodes will measurably assist you to meet post-war competition.

We will be glad to send you samples of RACO 8010, 9010 and 10010. Just write—

These electrodes comply with A.W.S. A.S.T.M. Specifications A233-45T, E8010, E9010, E10010

The REID-AVERY COMPANY

INCORPORATED

DUNDALK BALTIMORE 22 MARYLAND

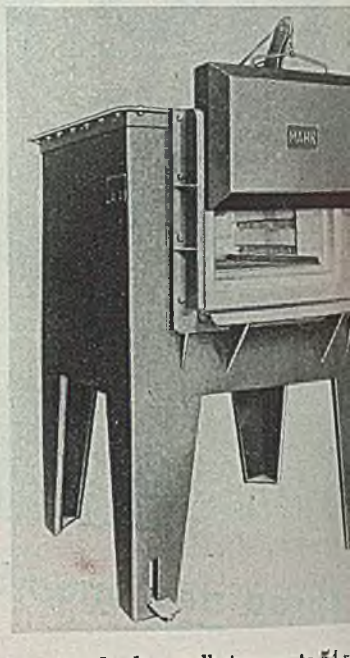
SINCE 1919 PRODUCERS OF ARC WELDING ELECTRODES AND WELDING RODS

is bending shaft; and as soon as pres is released it tells what happened on straightening "try" and gives a g for next operation.

Hydraulic unit is manufactured John S. Barnes Corp. of Rockford and was designed for this straig ing press.

Electric Heat Treater

Mahr Mfg. Co., division of Dia Iron Works Inc., 1702 North Se street, Minneapolis 11, announces a box type electric heat treater for treating processes to 2000°F. Built in



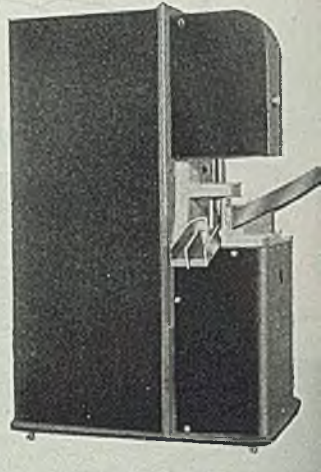
ous standard overall sizes up to 54 x 88 in., the unit will harden carbo alloy steels to 1850°F, temper heat t parts, anneal, normalize or preheat speed steels. It is also recommend a furnace for experimental and de ment work and is available with or out protective atmosphere.

Inspection Machine

A new automatic electronic gagi strument has been developed by tron Co., P. O. Box 722, Danvill Originally developed to gage the l of the firing pins in ordnance fuse unit is capable of automatically ga wide variety of small parts either plastic, ceramic, glass or paper. E automatic, the machine can gag depth of holes, external lengths an side diameters to very close tole with high precision. It operates speed upwards of 3300 pieces per Speed of machine depends upon shape and manner in which part gaged may be handled. When p the machine can be hopper fed i leading chute from which point the chine automatically feeds the piece inspection position.

Mechanical contact is made at sired point in the work by a stylu to which is attached a razor-like Image of this flag is projected int

optical system by light. A high order magnification is produced causing a sha ow of this flag to be projected and flected onto a panel of two photo el tric tubes. Distance between these t tubes represents tolerance of the dim sion being gaged. This distance can widened or narrowed by micrometer justment according to the tolerance sired. Shadow of flag must lie betw two photo tubes for part to be auto tically accepted. Acting as switches, tube must be covered by shadow and other must be in the light to acti acceptance mechanism. If the dimens of the piece is above the limit both t

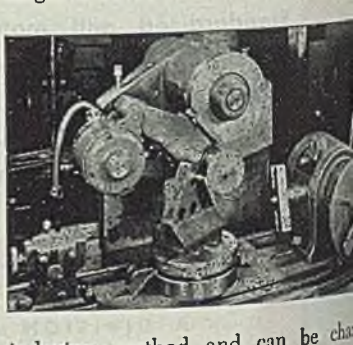


will be shadowed also causing the to be rejected. According to the m it is possible to gage dimensions tolerances as small as 0.0001-in. wit curacy.

It is possible to gage the depth holes using either end of pieces reference point; shoulders within projections from bottom of holes; ou length of pieces or outside diameter

Angle Dresser

A Dunmore grinding attach mounted on a Brown & Sharpe gr is introduced by Zagar Tool Inc., Lakeland boulevard, Cleveland 17. diamond is moved by hand acros face of the wheel to dress the w Angle is obtained through the comp



indexing method and can be ch for any angle required. The angle ser can be mounted in a centerlin lation to the work; need not be rem for each dressing of the wheel. using an index plate any angle ca duplicated on the dresser in mini amount of time.

Don't handicap tomorrow's equipment with yesterday's wiring

Wire ahead

IT'S A FACT that inadequate wiring can reduce equipment performance by twenty-five to fifty per cent. This is true right now—and think of your greatly expanded electrical future!

Remember, wiring comes *first!* Foresighted wiring based on future needs—not tied to formulas of the past. It costs nothing to review your wiring plans now. But it may cost plenty in shutdowns, teardowns to permit expensive alterations later.

Make a note of it: Check wiring plans! Call in your consulting or plant power engineer—electrical contractor or power salesman. Let them help match your wiring to future production hopes. Anaconda Wire & Cable Company, Subsidiary of Anaconda Copper Mining Company. General Offices: 25 Broadway, New York City 4. Chicago Office: 20 North Wacker Drive 6. Sales Offices in Principal Cities.

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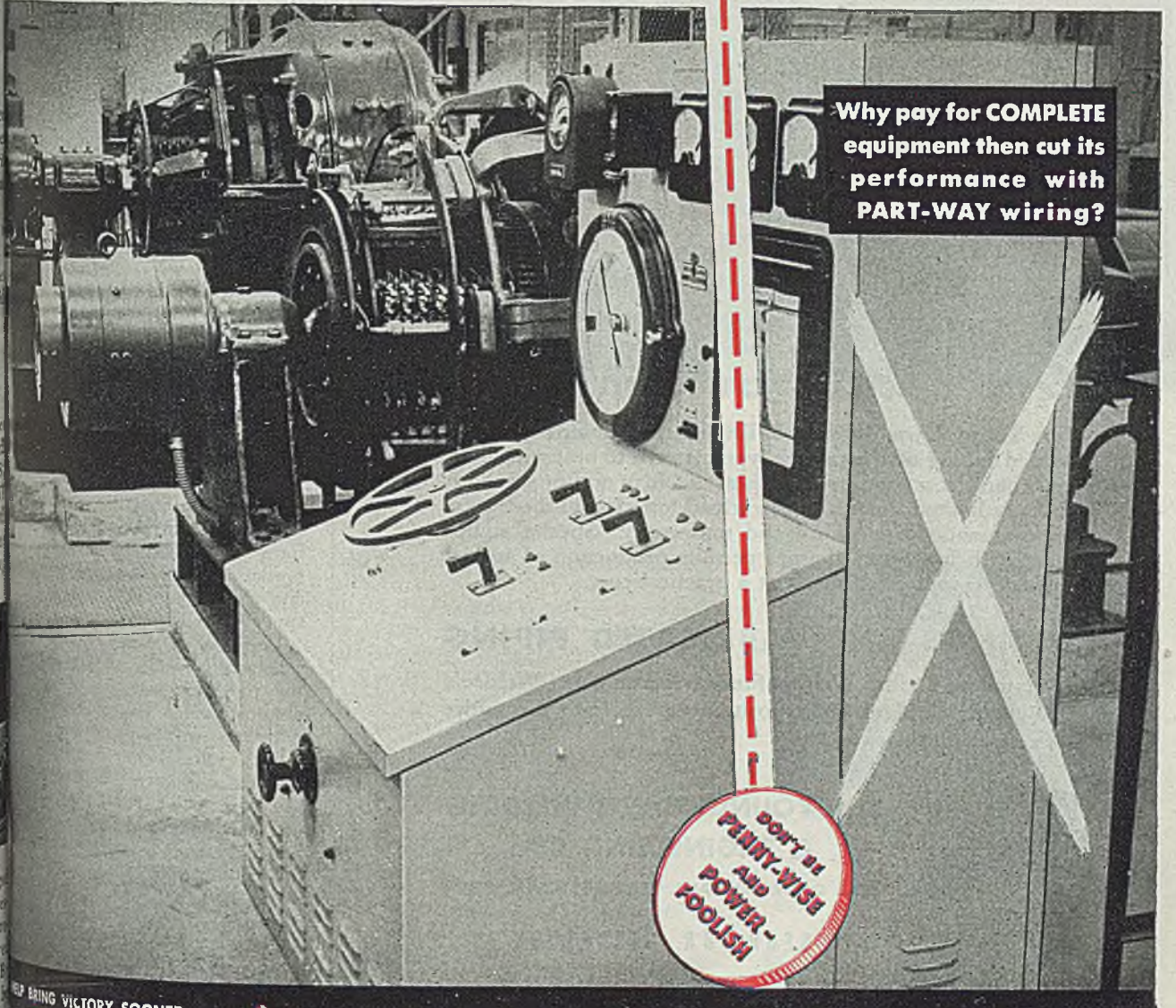


HELP BRING VICTORY SOONER ... BUY MORE WAR BONDS

ANACONDA

ANACONDA WIRE & CABLE COMPANY

Electrostatic Spraying

(*Continued from Page 120*)

is, as yet, an unknown factor; on inst lations of industrial size, that is, for spr ing table tops, stove parts, etc., it probably be necessary to use more tha single power pack; a slight increase amperage is also necessary to overc the additional resistance provided b larger electrode system.

On the basis of these conclusion program of research was laid out determine the effect of variations in physical properties of enamel slips the ability of these slips to atomize react to the electrostatic field, and produce a sprayed finish that is satis tory.

Atomization: For the purpose identification, the atomization sam were divided into four groups. such atomization samples illustrate method of classification. Fig. 4 s a poor degree of atomization appro ing the type of spray created by ordinary enamel gun; the combinatio very coarse and medium-sized part was marked. Fig. 5 still slightly u atomized, reveals the preponderanc large splotches has disappeared.

Fig. 6 shows the most satisfactory gree of atomization, all factors sidered, for electrostatic spraying porcelain enamels. Fig. 7 is an exa of overatomization; particles are so that many of them are carried aw the air stream. A comparison of atomization samples shows that quality of the finished sprayed r may be anticipated with a fair d of accuracy.

The difference in particle size in sprays is shown in Figs. 4 throug In Fig. 4, the atomization is quite c and decidedly non-uniform in chara Fig. 5 shows considerable improve although it still leaves much to b sired in uniformity and reductio particle size. The first two are to produce a sprayed surface too w practical purposes. Fig. 6 illustrate most satisfactory degree of atomiz Fig. 7 indicates a spray so fine although a maximum degree of formity has been obtained, the su produced would be dry and gra and the amount of enamel lost in spray would be excessive.

Location of Spray Gun: The satisfactory results in sprayed finish the most efficient use of materia obtained when an angle of 15 d with the surface being coated is tained. The atomized particles le the gun will vary somewhat in size therefore in inertia. In passing thr the field, those particles of greater will react more slowly to the force o field and will require a greater tance for this force to overcome inertia of the particles and direct to the surface to be coated. If the is increased, there is a tendency t duce the uniformity of the de through localization of the force o spray from the gun. At increased a there is an increased tendency to

WORLD'S LARGEST TELESCOPE

Riding on a Film of Lubricant

BILLIONS of minute bearings, comprising a thin film of lubricant, will support the weight of the world's largest telescope at Palomar, California. The colossal yoke rests upon lubricant pads at each end. A small quantity of lubricant pumped in under 250 pounds pressure, will float the entire telescope, with only 1/600th part of the friction that would be caused by the best roller or ball bearings made. The two huge cylinders of the yoke, bigger than the bodies of locomotives, are cradled in a tilting horseshoe at the north and the spreading wing of a box girder at the south. The giant 200" telescope actually floats clear of its bearings. The pressure of its tremendous weight is fully supported by lubricant with minimum friction.

Here in giant amplification is demonstrated the principle of the Nordstrom Lubricated Valve. The plug of this valve actually floats on a film of pressure lubricant that forms the seat of the plug. *It's easy to turn.*

KEEP UPKEEP DOWN

NORDSTROM VALVES

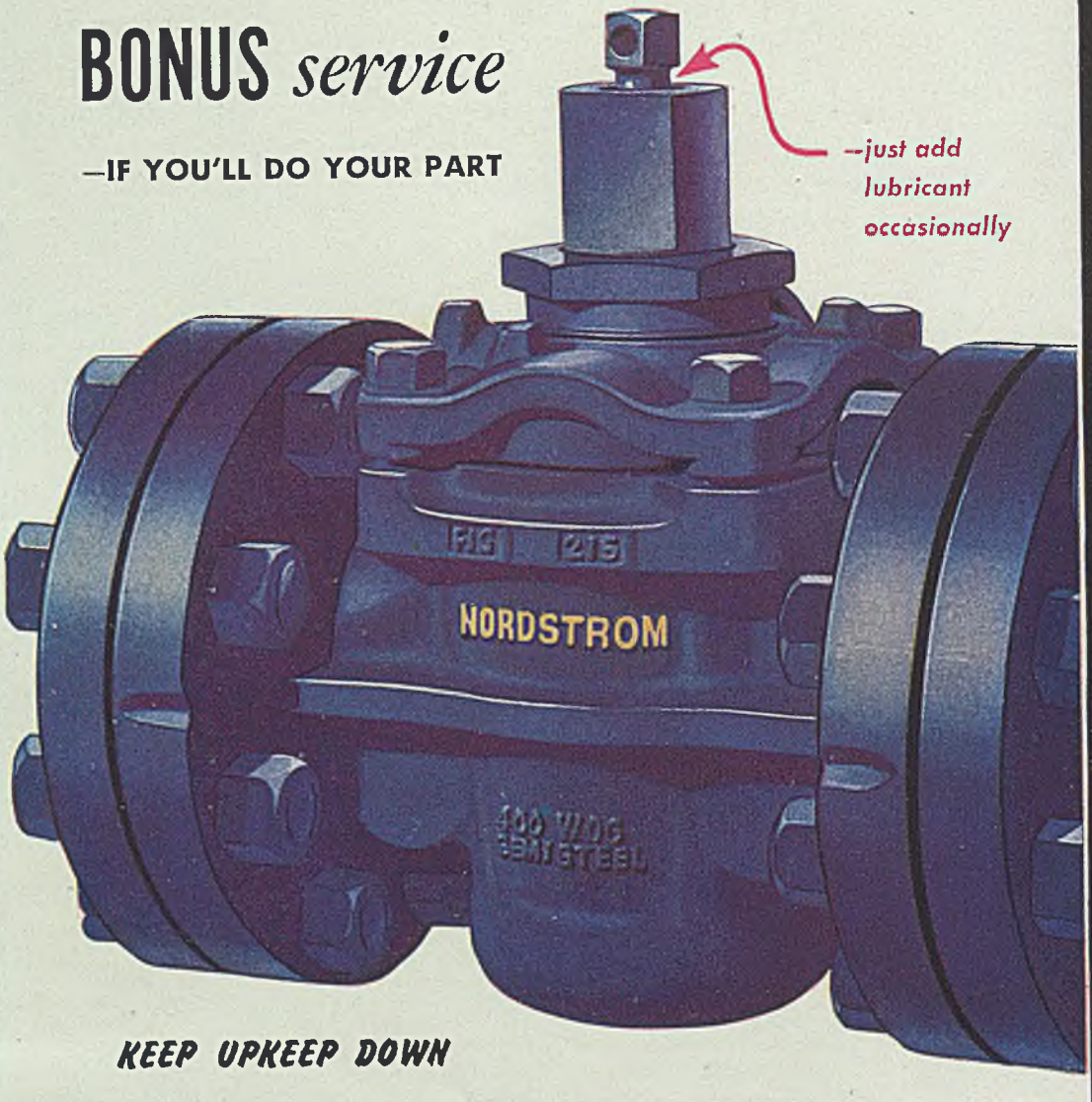
LUBRICATED

The valves that give you

BONUS *service*

—IF YOU'LL DO YOUR PART

—just add lubricant occasionally



KEEP UPKEEP DOWN

WE are just as anxious as you are to see that your Nordstrom Valves stretch their life far beyond the span of ordinary valve service. Critical war demands impose extra obligations. Every old valve kept in service provides one new valve for some other critical need. Check every valve. Put idle valves to work. And most important, keep them lubricated.

SUGGESTION FOR LONGER VALVE LIFE

Be sure that packi glands are properly justed.

Use only genui "Nordco" Lubricant

Follow factory rec mendations as to t of Lubricant for e specific service.

Valves should rece systematic lubrica to give maximum e of operation, posi shut-off, corrosion sistance and long life.

Nordstroms have h salvage value. A plug, lapped into old body, may years more of us life.

Give your valves same careful atten you give other v equipment.

Call in a Nordst field engineer to a you in any valve p lem.

Nordstrom LUBRICATED VALVES

FOR ALL-PURPOSE SERVICE

Sealdport Lubrica

MERCO NORDSTROM VALVE COMPANY — *A Subsidiary of Pittsburgh Equitable Meter Co*

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PRODUCTS: Nordstrom Lubricated Valves; Air, Curb and Meter Cocks • Nordco Valve Lubricants • EMCO Gas Meters • EMCO-McGaughy Int EMCO Regulators • Pittsburgh-National Meters for Gasoline, Grease, Oil, Water and other Liquids • Stupakoff Bottom Hole

...ng orange peel; and, at increased ...les of spray, there is also a tendency, ...ever slight, for the smaller atomized ...cles to be carried away from the ...face of the ware by the force of the ...ected air stream. Each dissimilar ob... that must be sprayed will require ...nation in the location and number ...spray guns for maximum coverage ...der that those surfaces which can... be completely covered by the force ...e electrostatic field may be covered ...chanical force of the spray itself.

...surement of Flow Time: To sim... the investigation as much as pos... all pressures were read at the ... and no consideration was given ...ssure drops due to friction in the air ... fluid lines. Curves were plotted ... data showing constant-pressure lines ... the flow time in seconds was ...ed against the fluid delivery in cubic ...timeters per second. Fig. 8 shows ...type of curves arrived at by this ...od. By referring to these curves, ...pressure required to give any de... fluid delivery at any given flow ...may be predetermined; conversely, ...id delivery for any given com...n of pressure and flow time may ...ermined.

...ct of Clay Content: A comparison ...e atomization photographs indicate ... beyond any doubt the degree and ...ity of atomization increases with ...crease in clay content. Although ...r sample 4 nor 5 contained any ...whatever, No. 4 had practically ..., while No. 5 had excellent set. ...parison of the atomization photo... between these two indicated little ... difference. Sample plates sprayed ...lips of varying clay content in... that a slightly finer sprayed tex... is obtained with the sample of ...t clay content.

...ts of Specific Gravity of Water ...: Plates, in general, could not ...sprayed successfully by this method ... a 1.60 specific gravity. The ... was deposited in too wet a state, ...g a considerable amount to flow ... the sheet. At specific gravities of ...and 1.55, almost all sprayed samples ... Where the remainder of any ... series obviously would not have ...ced satisfactory results, no effort ...made to complete the series.

...ere was, at all specific gravities, a ... amount of orange peel when the ...rtion of fluid delivered to the ...t of atomizing air was high. This ...ge-peeling tendency decreased with ...ased atomization. Increases in ...zing pressure gave drier surfaces, ...r coverage, and generally improved ...ppearance of the sprayed plate. ...ults improved with increase in ... gravity, and the best sprayed ... were obtained at a specific gravity ...1.95.

...o determine the quality of sprayed ...s at actual fluid delivery rather than ...ressures, the fluid pressure at which ... plate was sprayed was converted to ...me of fluid delivered. Regardless ...specific gravity, the best results were ...ically obtained when the fluid de-

livery was approximately 2 cc per se ond, together with the necessary atomi ing pressure to provide a satisfactory d gree of atomization. Further comparis of the results established a minimu fluid delivery of 1.5 cc per second and maximum delivery of 2.5 cc per seco for acceptable results.

The atomizing pressure was read the source. When a pressure ga was inserted in the atomizing line j ahead of the spray gun, the true ato zing pressure at the gun was found be approximately 5 lb less than t indicated at the source.

Atomizing pressures above 25 lb creased the velocity of the spray such an extent that the amount of o spray appeared to be excessive.

Effect of Set: The most satisfact degree of atomization coincides gener with the most satisfactory sprayed sults. Based on this observation, it be concluded that the degree of atom tion attained may serve as a satisfac guide to the quality of the ware spra by this process. The results obtained the effect of set are shown in Tabl The weight of enamel is seen to incr slightly as the set increases. The gree of atomization was not affe by changes in set. A high set gener gave the best sprayed results. Sam Nos. 86 and 87 could not be spra satisfactorily because the set of the amel was destroyed to the point w the enamel would run off the war rapidly as it was deposited thereo

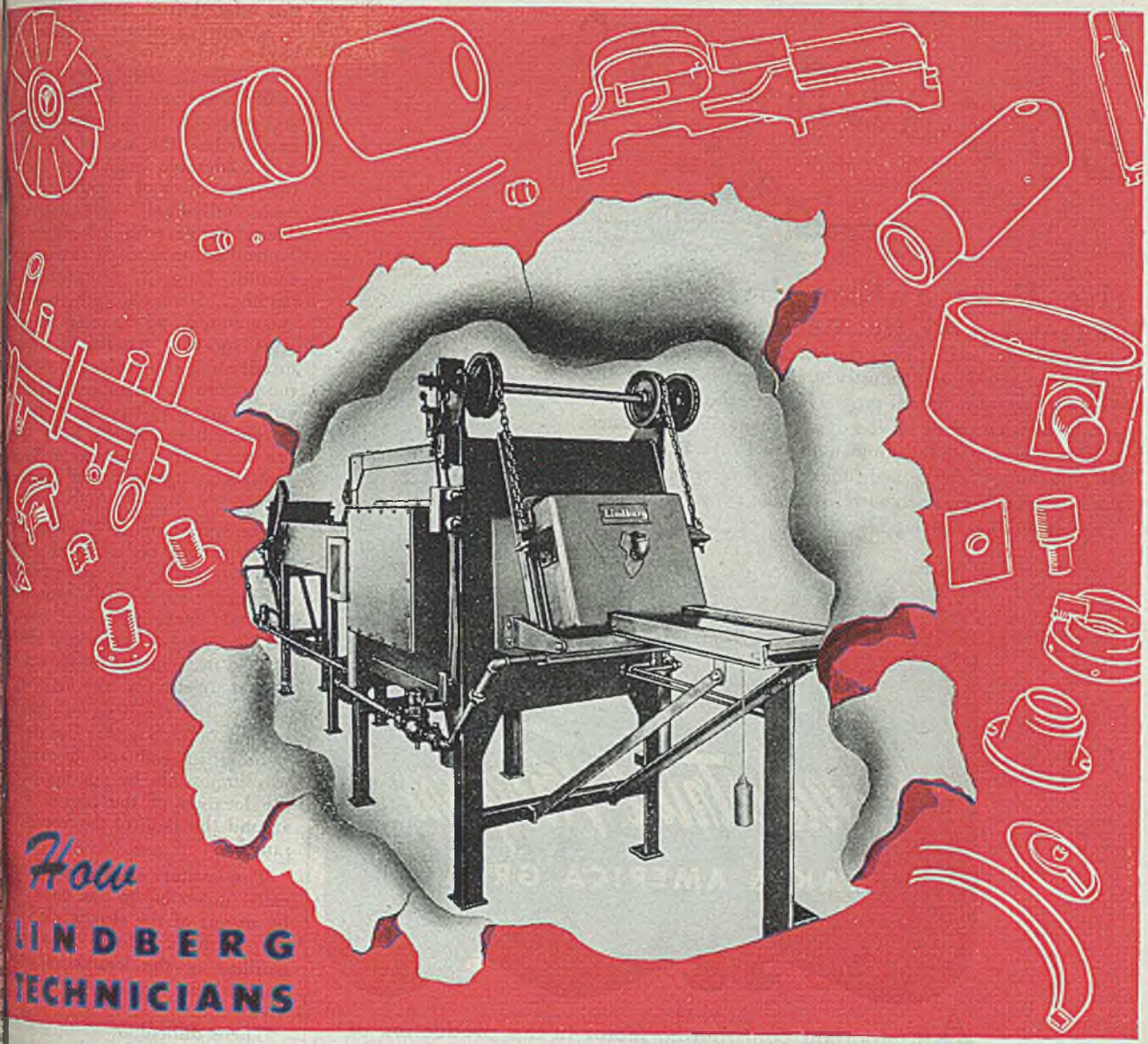
Effect of Fineness: The data tained in this phase of the investig are shown in Table II. The fo column gives a comparison of the weight of the enamel deposited on plate for each fineness, based on total volume of the enamel sprayed each sample. The application weig a percentage basis actually decr slightly down through 2 per cen 200-mesh. The percentage applic weight for the sample 2 per cen 325-mesh is the highest in the seri

The results indicate that enamel m through a fineness above 5 per on 200-mesh produces a granular sp surface which will not smooth entirely on firing. With the more coa milled enamels, there was a slight duction in the gloss of the fired en

As indicated in Table II, there wa difference in atomization on any o samples from 15 per cent on 200- to 2 per cent on 200-mesh. The en ground to 2 per cent on 325-mesh pears to be slightly less uniform atomization than the remainder of samples.

Overspray: From the data obt in determining what savings migh expected in the way of reduced spray, a figure of 28.9 per cent wa tained. Owing to the length of field and the size of the sample p used, this figure is somewhat higher would normally be found in an indu application. The amount of overs probably would be reduced to as as 15 to 20 per cent.

Spraying of Shapes: An opport



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high-production efficiency of this versatile all-pose Lindberg Brazing Furnace — plus the ical assistance of our able research staff — lping many manufacturers reduce costs and ed reconversion.

e parts sketched above are typical of many g produced faster . . . better . . . cheaper by basic improvement in production technique.

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was offered from time to time
a variety of shapes. These
broiler doors, refrigerator inner
oven liners, architectural pane
finally a section of a lavatory.
and shape of the majority of thes
necessitated the use of multipl
A considerable amount of adju
the location and number of
each individual shape was
Those pieces with flat surfaces
protruding or recessed sections,
simple flanges, were sprayed
readily. Some difficulty, howe
encountered, when using two
guns spraying parallel to one
in adjusting the position of the
the pattern of the sprays so as t
either an over-lapping of the
causing an excessively heavy d
one area, or a division of th
causing a slightly lighter depos
area.

The variations in thickness
cation cannot be compared in
with those found in spraying p
lacquers, because such minor
as would cause rejection of war
in porcelain enamel would sc
noticed in lacquer finishes owin
greater opacity or covering pow

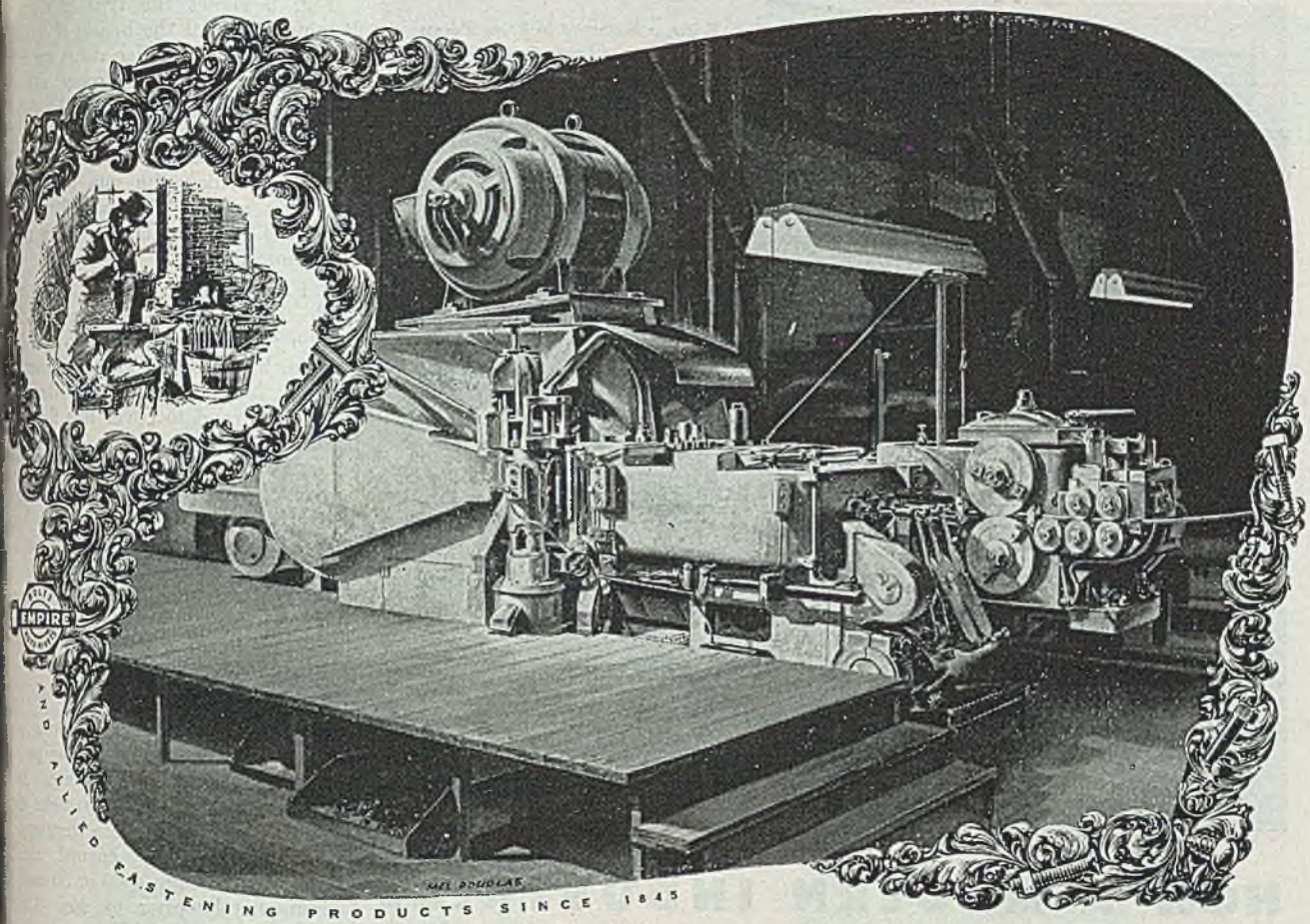
Two of the sprayed shap
formed in such a way that the
were either embossed or corru
was impossible by any manipu
the location of the guns to fi
around the radii of the recesses
samples.

The lavatory section was fou
cally impossible to coat uniform
by means of the electrostatic fi
the mechanical force of the s
gardless of the location or n
guns within the limits of the e
used.

These difficulties which were
tered in spraying the various sh
resent limitations on the use
equipment. Perhaps they migh
properly referred to as obstac
must be overcome before maxi
vantage may be taken of the
It is evident that, as in elect
protruding edges and recessed
are quite difficult to cover
This may be rectified in the
the electrode system to compe
the difference in distance bet
electrode and the grounded
in the location and number of g

Cylindrical or similarly sy
shapes may be sprayed quite
by causing them to pass thr
electrostatic field while rotating
axes of symmetry. Such shapes
mos bottles, powder cases, and
have been sprayed with paints
quers by this method with a g
of success both as to uniform
savings of materials.

The spraying process and t
of the electrostatic field are i
quite clearly in Figs. 9 and
10 x 18-in. broiler doors a
sprayed with a single gun at a
speed of 2½ fpm. The pro
course, could be adjusted to any
speed by the use of addition



These are the things that make America strong: enterprise, ingenuity, an eagerness to answer challenges . . . characteristics which have helped the bolt and nut business to meet the increasingly severe requirements of General Industry.

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From 1845 when RB&W shipped its bolts and nuts up the Hudson in two-masted schooners to the present when streamlined trains or high speed trucks hurry them on their way . . . developments and refinements in equipment as well as in material control and treatment have constantly helped to improve the strength, accuracy and finish of RB&W EMPIRE Bolts and Nuts . . . Today, upon its 100th anniversary, with its products being used by most of the world's leaders, with the quality of those products reflecting the importance of fasteners in the great pattern of Industry . . . RB&W pledges continuance of its traditional policy of investing heavily in research and equipment . . . so that RB&W EMPIRE will continue to stand for the *utmost* in dependability.

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Fig. 9 shows the type of deposi tained without the benefit of electr field. These broiler doors are a passing through the spray, altho is so fine that it cannot be dis The leading flange on the doors a light deposit of enamel on th toward which the gun is direct clearly seen. The only flange c by the spray is that on which th impinges.

Fig. 10 illustrates the effect a electrostatic field has been switch The leading flange, which was f bare, has been completely covere spray has actually turned throug and returned to cover this flange side opposite the gun. The top a tom flanges (not shown in the are also covered. Complete c of the broiler doors has thus b tained on all flanges as well as face. The effect of the field seen plainly just opposite the fi trode wire. The force of the f caused the spray to bend out of as quickly as it enters.

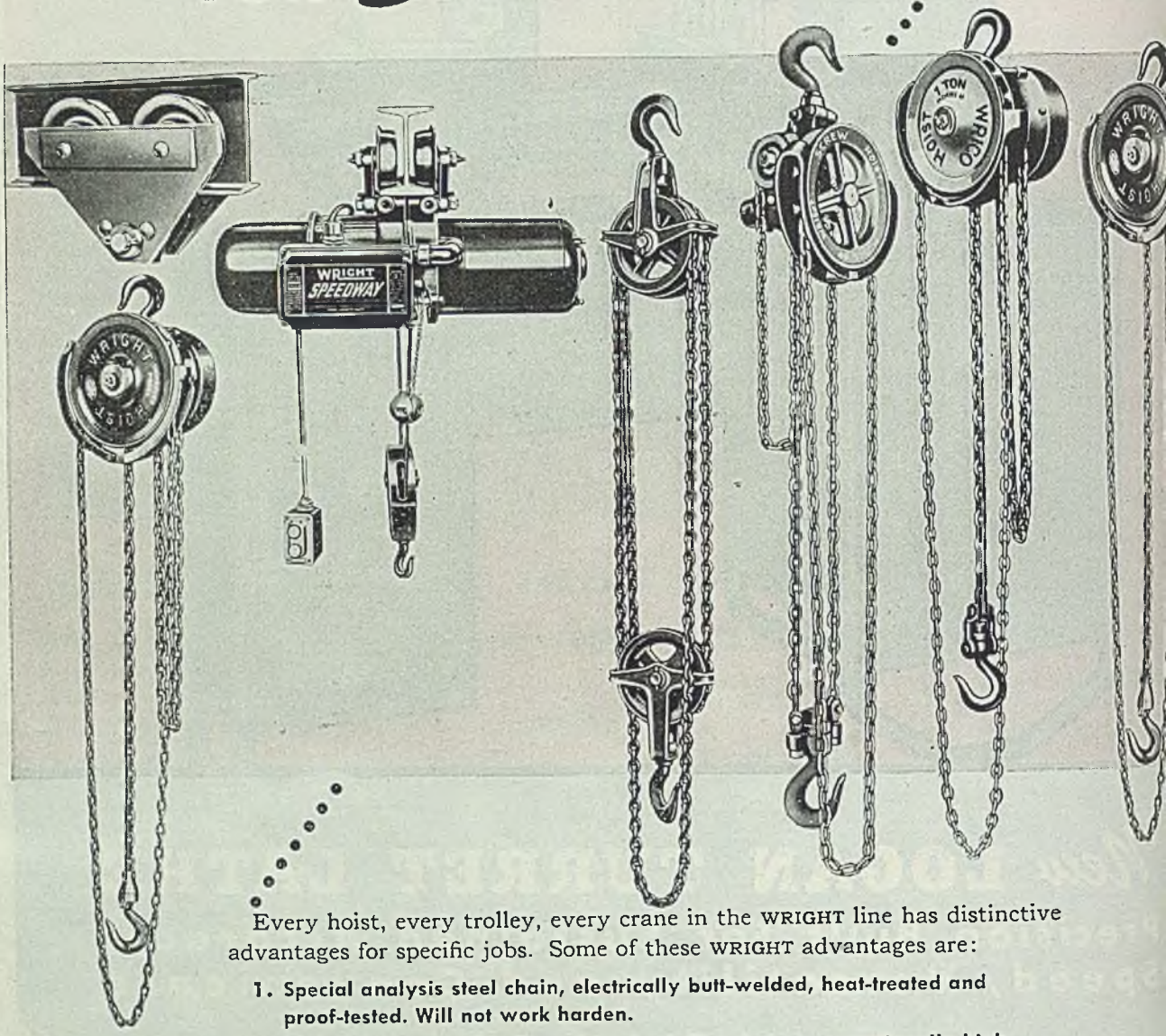
Discussion of Results: The of the operation depends to a l tent on proper care in the pre of the enamel for spraying. T certain that no coarse particles a ent which might cause stoppage spray guns, the enamel sho screened through a 40 or 60-mes immediately prior to use. Co the various physical properties enamel slip, such as fineness, gravity, and set, assumes an even degree of importance with this operation than it does in the mechanical-spraying operations existence.

In normal operations, atomizi sures from 15 to 20 lb are suffi provide the degree and unifor atomization required. Atomizin sures in excess of 20 lb incre amount of over-spray to the poin it appears to be excessive. For results, atomizing pressures sho be allowed to vary from a given by more than 1/2 lb.

Fluid pressures will vary fro 13 lb, depending on the viscosit slip. Control of fluid pressures i the most critical phases of the operation. Since comparatively quantities of fluid are being d through each gun, any minor v in fluid delivery through the g actually amount to a relatively percentage of variation; and si fluid pressure governs the vol fluid being delivered, minute va in the fluid pressure are evide noticeable variations in the fluid Fluctuations in fluid delivery r variations in the degree of ato and so decrease the uniformity spray. An accurate pressure system, then, is an absolute nece

Although the investigation i that the clay content of the enam has a decided effect on the da atomization obtainable, the effect so severe as to make the elimina clay from the mill additions essent

THE WRIGHT LINE FOR *Economical* PRODUCTIO



Every hoist, every trolley, every crane in the WRIGHT line has distinctive advantages for specific jobs. Some of these WRIGHT advantages are:

1. **Special analysis steel chain, electrically butt-welded, heat-treated and proof-tested. Will not work harden.**
2. **Each link is gauged to fit pocket wheel. The chain is exceptionally high in tensile strength.**
3. **Non-fouling chain guide permits pulling of hand chain from any angle below hoist.**
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a matter of fact, the presence of a small amount of clay in the milled enamel under certain conditions may have a slight tendency to improve the workability of the system and the appearance of the sprayed surface.

To summarize the results of the portion of the investigation devoted to the effect of specific gravity or water content, when the specific gravity was below 1.60 and the set generally poor, the sprayed surfaces were almost invariably too wet, the enamel running off the plate entirely in some instances while in others a severe sagging was noted. This sagging took place whenever the set was poor. The best samples were obtained at the specific gravity of 1.70.

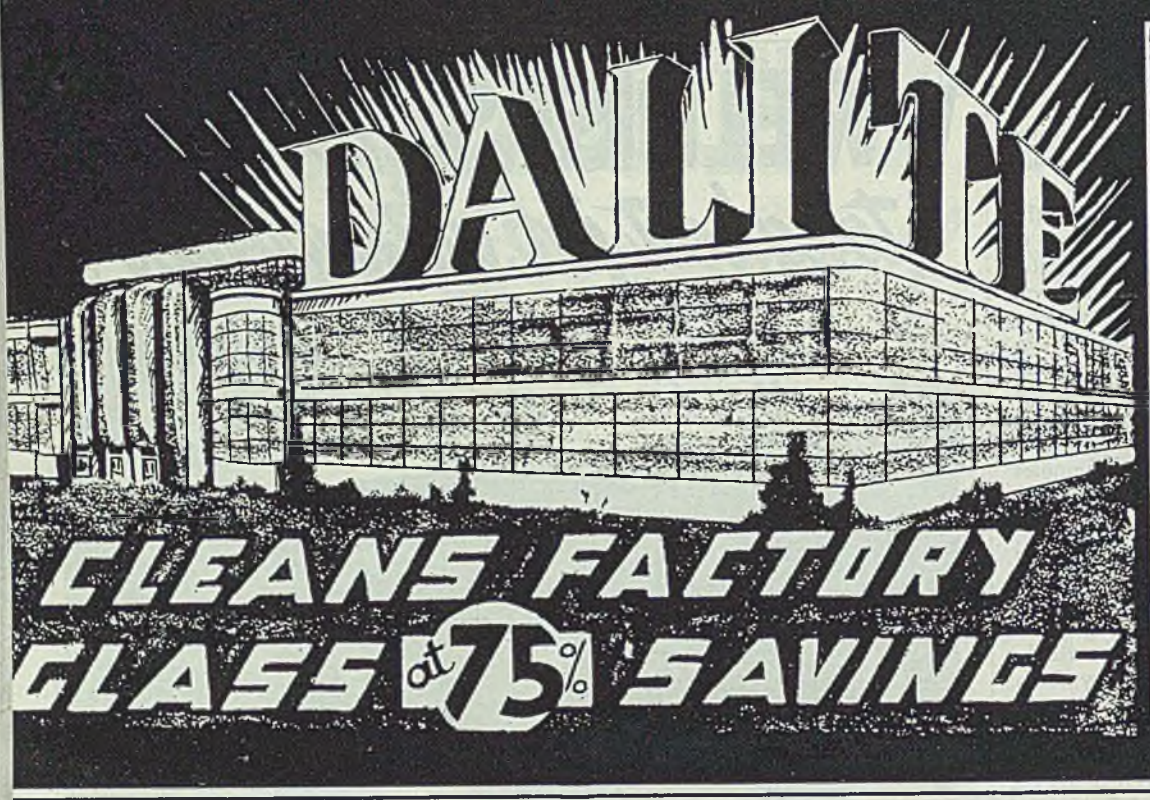
In comparing the quality of the sprayed finish at each specific gravity with the volume of fluid being delivered to the gun at various pressure settings, the best sprayed samples were invariably obtained when the fluid delivery from the gun approximated 2 cc per second. Closer scrutiny of these results indicated that all samples were generally poor when the fluid delivery exceeded 2.5 cc per second or fell below 1.5 cc per second.

The set of the enamel appears to play a relatively small part in the ability of the enamel to react to the electrostatic field or in the degree of atomization obtainable. In view of the exaggerated tendency for the enamel to sag at the comparatively low specific gravities used, a minimum degree of set must be maintained.

Regardless of the fact that the data obtained would seem to indicate that enamel milled to a fineness above 2 per cent on 200-mesh may not be used successfully, it is believd that enamels may be sprayed equally well when milled to a fineness as high as 5 per cent on 200-mesh. This conclusion is based on the fact that the enamels used in this phase of investigation, having been prepared in 3 lb laboratory mills, were composed of particles of frit of considerably greater average particle size than if large mills were used.

Mill additions other than clay have no apparent effect on the ability of the enamel to react to the electrostatic field. The increased viscosity of the slip, contrary to what might have been expected, does not, within working limits, affect the ability of the enamel slip to atomize. Difficulty will undoubtedly be encountered at first in determining the proper location and adjustment of spray guns to provide the desired degree of uniformity of application. When a standard operating procedure is established, however, a minimum variation in the finished quality may be anticipated.

Conclusions: The factors which make electrostatic spraying valuable in the application of organic coatings apply equally to porcelain enamel. The process can be satisfactorily used for spraying porcelain enamels, and when properly used, produces a uniformly coated product with a minimum of loss due to overspray. Although the process appears to offer



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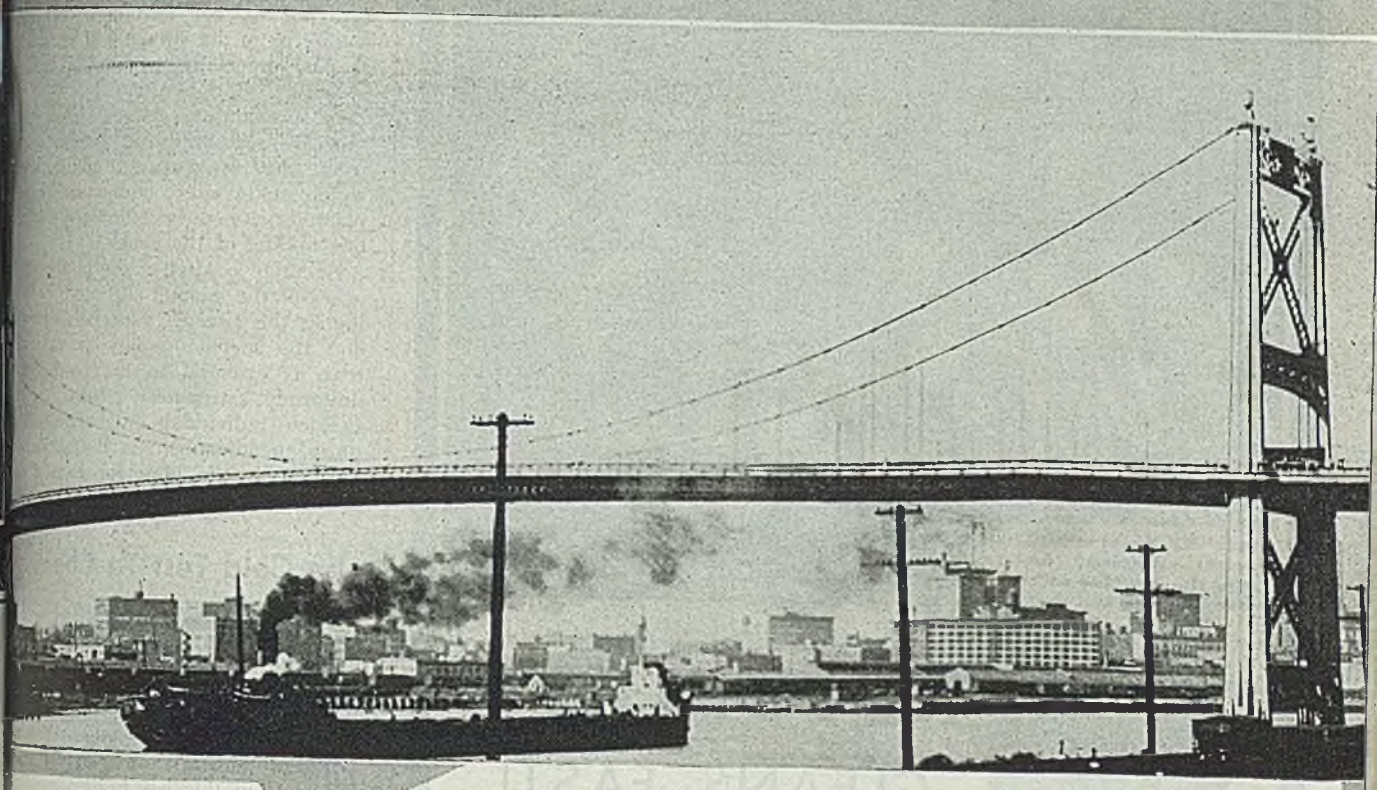
ARRESTS AND PREVENTS RUST



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This bridge was painted in 1937 and upon recent inspection RUSTAREST is still in good condition.

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The LARGEST SINGLE ITEM OF EXPENSE in repainting is the preparation of the metal. Because Rustarest may be applied over rust, this expense is practically eliminated. (When paint is used, all rust must be removed or the rusting action will continue and soon break through the paint or force it off). Because Rustarest kills rust and renders the metal passive and keeps it so, there is no destructive action going on under the paint . . . no attack from the rear. Therefore, it will LAST LONGER and repaint operations will be LESS frequent. There will be NO STRUCTURAL DETERIORATION from corrosion during Rustarest's long life. Rustarest covers from TWO TO THREE TIMES AS MANY square feet per gallon as paint.

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an appreciable savings in material co sumption, proof of this fact may be o tained only through an industrial i stallation of the equipment.

The process lends itself readily to t spraying of flat surfaces with simp flanges or to the spraying of symmetri shapes, especially where the operati is highly repetitive.

In preparation of the enamel, process necessitates no radical chan from the conventional mill additi which might affect equipment or lay planning nor does it involve extrem fine milling of the enamel.

Accurate control of the physical pr erties of the enamel slip used for spr ing in this process, especially of the and the specific gravity or water c tent, is essential to the production uniformly satisfactory results.

Each individual installation will quire an adjustment in the number location of the guns for most effic operation.

Use Cold Test To Check Shock Absorbers

Motor vehicle and railroad shock sorbers built in summer weather will operate efficiently on cold wi days, even in arctic regions where t perature stays below zero for a time. How this has been accompli in the plant of Monroe Auto Equipm Co., Monroe, Mich., is revealed by frigeration Equipment Manufactu Association following a survey of uses of refrigeration in peacetime.

Cold tests of recently installed eq ment employ temperatures as low minus 120°F, controlled to a frac of a degree. By determining degree stiffness of shock absorber fluid various low temperature ranges and testing on dynamometers the resist of shock absorber valves, a mediu reached so that shock absorbers operate equally well under all condit As temperature drops and fluid stiff action of shock absorbers is retarded less compensated for by proper reg tion of valves.

Refrigeration equipment is used testing the two-way hydraulic shock sorbers used on passenger cars, tr and buses, railroad freight cars Pullmans, and hydraulic seats for tr and tractors.

Weld Cast Iron

A new welding electrode for ma machinable welds in cast iron has produced by International Nickel new electrode plant at Bayonne, N. is a development of Inco's Rese Laboratory, with the co-operation of Bayonne Works. Designated as Ni-R the electrode is a mate to another e parable electrode known as "133", 80-20 nickel-chromimium product welding the Inconel side of Inc clad steel .In all, six types are in duction at Bayonne.

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Scrap Collection

(*Concluded from Page 121*)

material handled is selected to me conditions in the field, also the conve ing velocity is selected to elimina any possibility of the material settli in the conveying ducts. The horsepow required on a system of this type vari in proportion to the length of the syste However, most installations require rel tively low power.

The system as outlined above, colle the chips at the source. Other syste have been installed where the mater handled is in the form of long turnin In this case, however, the scrap tu ings are delivered to a central locati and are fed manually to a crusher. T crusher then feeds the chips to t conveying system and the chips blown into storage bins.

A typical Sturtevant system of t type is installed in a large plant in N Jersey. The scrap generated runs hea to long alloy turnings from automa lathes and screw machines. This syst was installed primarily for improved reclamation. Turnings, heavily coated, are manually taken by eleva two floors up to crushers, and are th spun through oil ringers and discharg to hoppers by gravity, and then blo through a steel pipe to railroad car

In this case, no separator is requir as little or no dust is introduced i the system. In all cases, the mate must be fed to the system at a fir uniform rate.

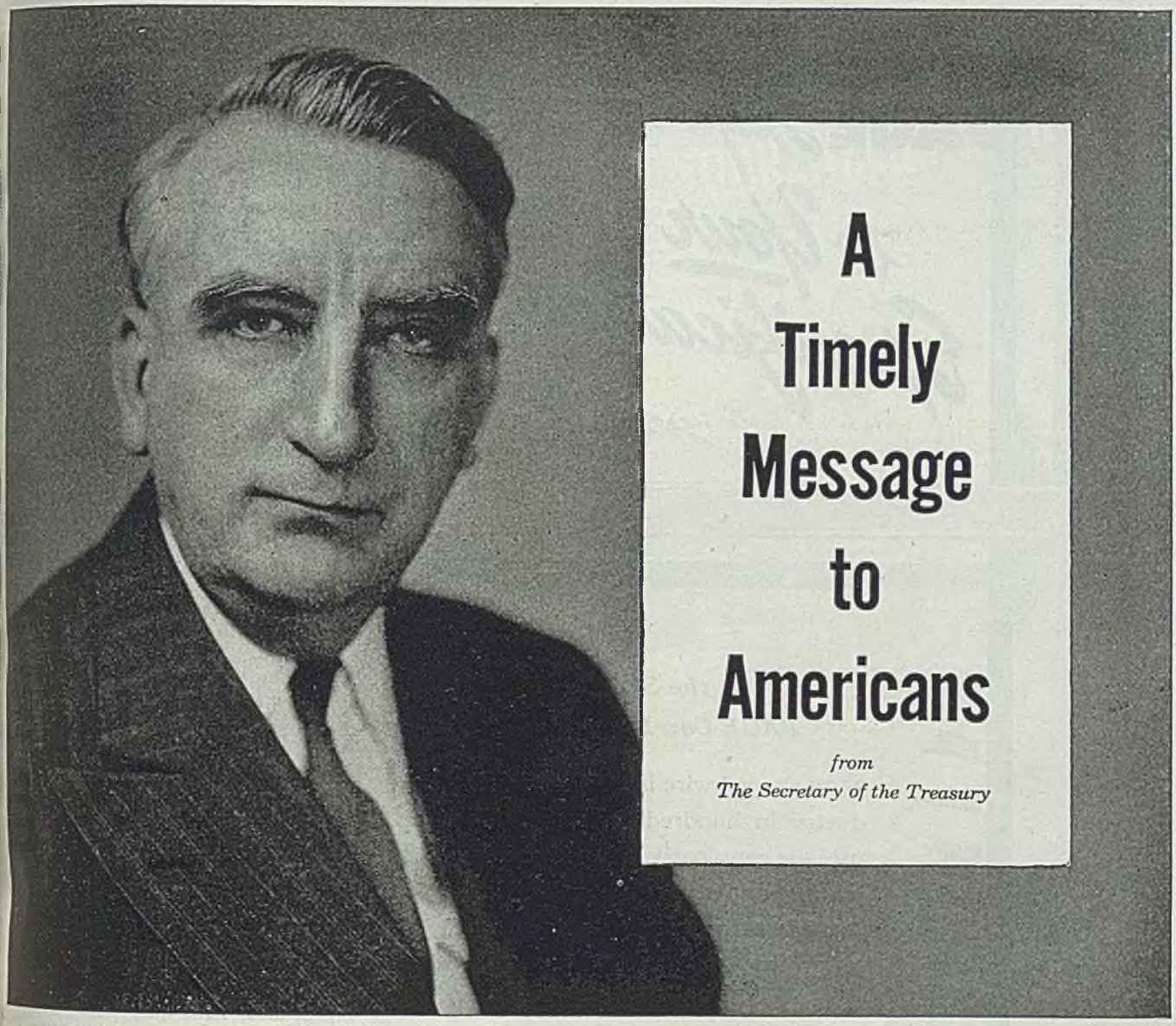
Die Casting Design for High Pressure Production

High-Pressure Die Casting, by H. Harvill and Paul R. Jordan; cloth, pages, 7 x 10 inches; published by H. Harvill Mfg. Co., Box 335, Vernon Ca for $5.

Under the subtitle Design Guide Engineers this volume concerns its mainly with the design aspects of die ca ing rather than analysis of the end of parts produced by this method.

The first 20 pages are devoted processes of die casting and the met used, for the benefit of readers with previous knowledge or experience wi die casting techniques. The remainc of the text emphasizes the sizes and typ of dies and their degree of complexi and relationship of casting design to d design. With this foundation the v ume discusses important elements of co rect design of parts to be produced this method.

A chapter is devoted to discussion pressure mold or premium quality d castings, with particular reference to r cent specifications wherein mechanic properties far higher than any previous adopted by the industry are provide Simplified methods of machining are di cussed and 25 typical castings are di cussed, covering a wide variety of meta and types of product, with explanatio of the use of the part and those element of its design which made it successfu



A Timely Message to Americans

from
The Secretary of the Treasury

America has much to be thankful for.

Abroad we have overcome enemies whose strength not long ago sent a shudder of fear throughout the world.

At home we have checked an enemy that would have impaired our economy and our American way of life. That enemy was inflation—runaway prices.

The credit for this achievement, like the credit for military victory, belongs to the people.

You—the individual American citizen—have kept our economy strong in the face of the greatest inflationary threat this nation ever faced.

You did it by simple, everyday acts of good citizenship.

You put, on the average, nearly one-fourth of your income into War Bonds and other savings. The 85,000,000 owners of War Bonds not only helped pay the costs of war, but also contributed greatly to a stable, prosperous postwar nation.

You, the individual American citizen, also helped by cooperation with rationing, price and wage controls, by exercising restraint in your buying and by accepting high wartime taxes.

All those things relieved the pressure on prices.

THE TASK AHEAD

We now set our faces toward this future: a prosperous, stable postwar America—an America with jobs and an opportunity for all.

To achieve this we must steer a firm course between an inflationary price rise such as followed World War I and a deflation that might mean prolonged unemployment. Prices rose more sharply after the last war than they did during the conflict and paved the way for the depression that followed—a depression which meant unemployment, business failures and farm foreclosures for many.

Today *you* can help steer our course toward a prosperous America:

—by buying all the Victory Bonds you can afford *and by holding on to the War Bonds you now have*

—by cooperating with such price, rationing and other controls as may be necessary for a while longer

—by continuing to exercise patience and good sense with high faith in our future.

The challenge to America of switching from war to peace with a minimum of clashing gears is a big one.

But it is a small one compared to the tasks this nation has accomplished since Sunday, December 7, 1941.

Fred M. Vinson
Secretary of the Treasury

A Government message prepared by the War Advertising Council and contributed by this magazine in cooperation with the Magazine Publishers of America.

Sodium Hydride Descaling

(*Continued from Page 123*)

generator boxes of ordinary welded ste into which metallic sodium is fed. A ammonia dissociator (Fig. 2) is installe in a separate building from the pick house, and dissociated ammonia produce bubbles through the molten caustic the rectangular generator boxes whi are open at the bottom. Dissociated a monia then passes through the metall sodium which melts when placed on t of the molten caustic in the generat boxes to form the sodium hydride in t solution.

Lids on the generator boxes have ve holes through which excess hydrog escapes. In order to prevent a critic mixture of air and hydrogen in the p tion of the generator boxes extendi above the level of the liquid molt caustic, the hydrogen is fed in in su amounts (from 80 to 160 cu ft "cracked gas" per ton of descaled met that there is enough to satisfy the s dium, fill the generator boxes, and bu a flame in the vents, as may be seen Fig. 3.

The anhydrous ammonia used for t dissociator is provided in cylinders f the Jessop operation. (See Fig. 2.) A hydrous ammonia, however, can be o tained in tank car lots, and in this fo the process would require that much l manual adjustment.

Operating Procedure. After placing rack of material in the hydride bath f 15 min, it is quenched in water. Ste formed by the metal at 700° F actua blasts loose a substantial amount of duced oxide in the quench bath. Mater usually comes off in the water in lar patches, but in other cases is more fine divided. After quenching, work is hos with a high-pressure water stream (Fi 1) to further remove reduced scale whic by this time, is fairly loose.

After hosing off the metal, it is giv a comparatively short dip (2 min) in sulphuric acid bath to remove all trac of frozen caustic and loosen remainin scale. This treatment is accomplish in a 5 to 10 per cent sulphuric acid ba To passivate the stainless steel, a whiten it, work next is placed for 2 3 min in a 10 per cent nitric acid ba at 160° F. If material being treated composite metal, the latter treatment do not over-pickle the backing steel.

Precautions. When using sodium h dride pickling, it is necessary at all tim to keep it up to temperature, as th volume of the bath would require very considerable length of time to m melt should it be allowed to freez Generally speaking, the same procedu governing a galvanizing bath (in rega to keeping it in a molten state) is fo lowed. If failure should occur in th heating system, it is necessary to di out of the tank and into drums as muc of the molten caustic as possible befo it freezes. This can be remelted whe the difficulty is overcome.

Because of the necessity for continua ly keeping the bath in condition and a

temperature, a steady stream of mat must be put through the system in o to keep the cost per pound to p within economic limits. It is esse to have proper ventilation over the tank and the quench tank, in the of powerful draw-out fans, so a insure working conditions that will guard employes.

Straight-chromium stainless steels high chromium-nickel stainless steel be white pickled by this method out sand blasting. We believe th a great advantage afforded by pro

The sodium hydride descaling p had its laboratory development Dr. Harvey N. Gilbert, Electroc icals Department, E. I. du Pon Nemours & Co. Inc., Niagara Fal Y. It is covered by United States ent No. 2,377,876, held by du and now is available to interested panies either for laboratory or co cial application, free from licen royalty in the United States. Acc to Dr. Gilbert, the process went int duction immediately upon reachin development and has had only m ical improvement during the past It has been in operation at Jessop that long. Its extension has bee stricted due to the diversion of s for other war purposes, chief of was manufacture of tetraethyl lead

In summation, there are a num pointers which should be consider setting up and operating a sodiu dride pickling unit:

Fused caustic contains moistur must be dehydrated before hydrid be formed. This is done only in st a new bath by placing sodium bric the open surface where the sodium and floats and skims around in p due to the evolution of hydrogen the water. The hydrogen burns w violence, and only toward the e the dehydration period does the s show a tendency to burn. Any b can be stopped readily by stirrin sodium patch with an iron rod. bath is completely dehydrated, comes black and has an oily appea It produces at this point practica fumes or gas; however, during deh tion, ventilation is desirable to r the caustic spray formed. Dehyd does not have to be repeated.

Sodium is added at intervals by ducing sodium bricks through the hole of the generator box. Normall 2½ lb brick is added by means of to each generator every 15 min. F to 12 lb sodium is required per t steel treated, depending on rela amount of surface to be descaled dium hydride content is determin a simple gas test with a gas evo apparatus. Sodium feed is increa test is low, decreased if test exce or 3 per cent, whichever is ma desired.

Time of immersion depends on factors as character of scale, ma work, etc., and thus can range fr few seconds to 20 min.

Advantages of sodium hydride

scaling, rightfully claimed by Dr. C bert and borne out by experience h and elsewhere, may be summed up follows:

—There is no loss of metal, t eliminating losses of 2 to 3 per c usually lost in other pickling proces

—Containing active sodium hydr bath penetrates through work and p duces uniform descaling of all surfa

—There is no disposal of waste sidue.

—Bath does not produce hydr embrittlement of steel.

—All grades of alloy steels can descaled, and different grades can descaled interchangeably, using s procedure.

—Hydride bath will not cause pit of work.

—Working temperature is sufficie low that structure of metal is not leteriously affected.

—No electric current necessary.

—Ordinary low-carbon steel tank be used.

Bulletin Deals With Gaging Precision Holes

Gaging precision holes is discusse Bulletin No. 31 of Comtor Co., Wait 54, Mass., entitled "Shock-Absor Comtorplug Internal Comparator". C tents include: Description of this p ciple of gaging holes to fraction 0.0001-in., providing automatic alignment and self-centering of expan plug gage; illustrations of Comtorpl gaging holes in various products parts; description of sizes and capac from ¼ to 8-in. diameters and larger well as special types with in-reaches to 17 in. and more.

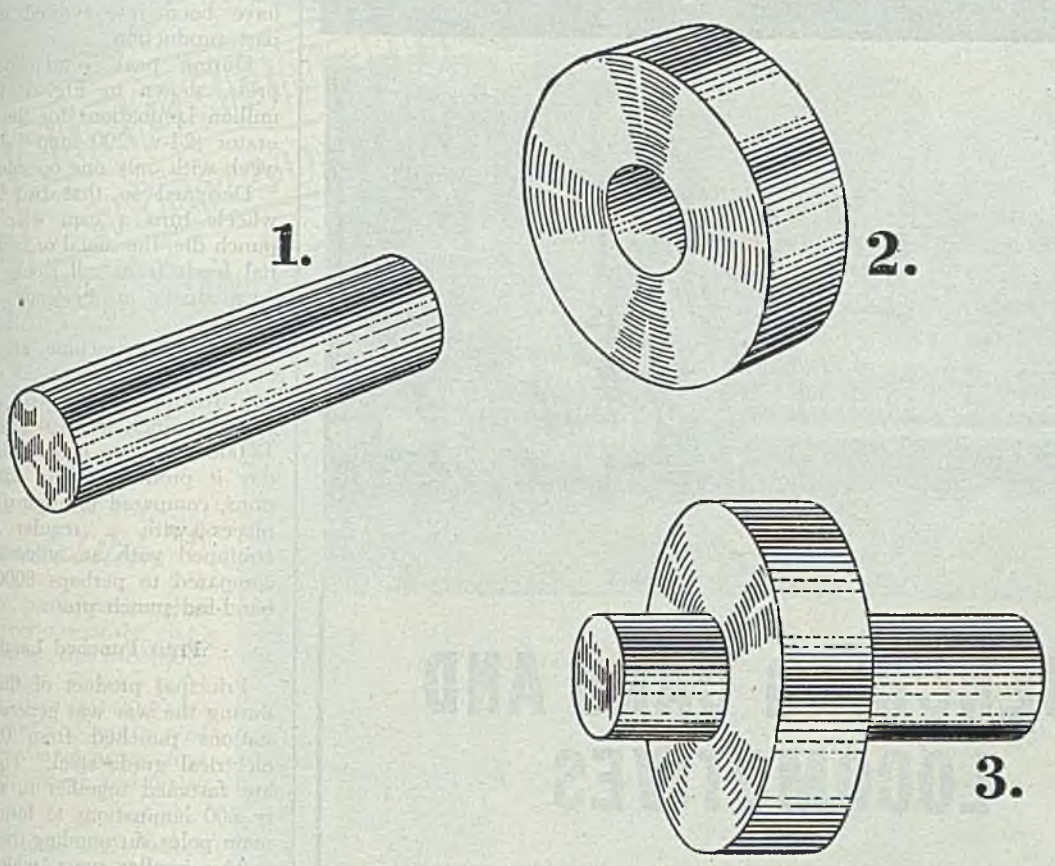
There is also an explanation of in changeability of all plugs in any am fier, and there are suggestions for ad ing the plug for use by machine o ators, bench inspectors, and final spectors.

Special Rivets Used To Fasten Porcelain

A new use for a one-piece interna threaded and counterbored tubular r which can be used as a blind rivet, plate for attachment, or both, and can headed or upset with a simple tool in the refrigeration industry. Twen eight Rivnuts are used on each unit a nutplate for attaching shelves. T are upset in a finished porcelainized in shell, where conventional riveting c not be used because bucking act cracks the porcelain finish. Rivnuts d up smooth without injury to finish, cording to the manufacturer, B. F. Go rich Co., Akron.

—o—

Soft grit blasting, employing materi such as ground corncobs and rice hu was widely used to remove carbon fr pistons of military engines during wa



JOINED . . . *by degrees!*

FOR years, *heat* has been used to set collars firmly on shafts—to fit metal parts tightly together. But the high temperatures needed introduce the risk of loss of temper. Additional machining is often necessary.

Now *cold* does the same job . . . faster and better! Low temperatures, to minus 50—100F., cool and contract the inner part. When in place, room temperature secures a final fit. In this way, so, both parts are joined . . . by degrees!

Here is one of the many better, more economical industrial processes developed through refrigeration. G-E equipment has contributed to such applications as treating aluminum rivets to retard ageing, the stabilization of metals, and in other ways controlling the behavior of metals and materials through the use of low temperatures.

This may suggest important ways to improve *your* production. When you want the best in air conditioning and refrigeration . . . see G.E. first! *General Electric Company, Air Conditioning Department, Section 54511, Bloomfield, New Jersey.*

BUY . . . and hold . . . VICTORY BONDS

GENERAL ELECTRIC

Industrial Refrigeration

Making Small Parts

(*Continued from Page* 125)

termination of war work, the pre have been re-converted to automo part production.

During peak production the la press, shown in Fig. 1, turned ou million laminations for the aircraft erator (24-v, 200 amp P-1) in a 4 week with only one operator.

Designed so that two large bal wheels turn a cam which carries punch die, the metal or fabricating m rial feeds from roll stock, or someti strip stock, in a steady flow thr the dies.

The larger machine, although cap of 800 revolutions of the cam per ute, usually is operated at about rpm, at which speed it turns out at 15,000 pieces an hour. Thus in an day it produces about 120,000 lam tions, compared to approximately 50 pieces with a regular punch equipped with an automatic feed, compared to perhaps 9000 pieces hand-fed punch press.

Press Punched Laminations

Principal product of the larger during the war was generator pole nations punched from 0.025-in. electrical grade steel. The pieces are fastened together in strips of ly 200 laminations to form each o main poles surrounding the armature

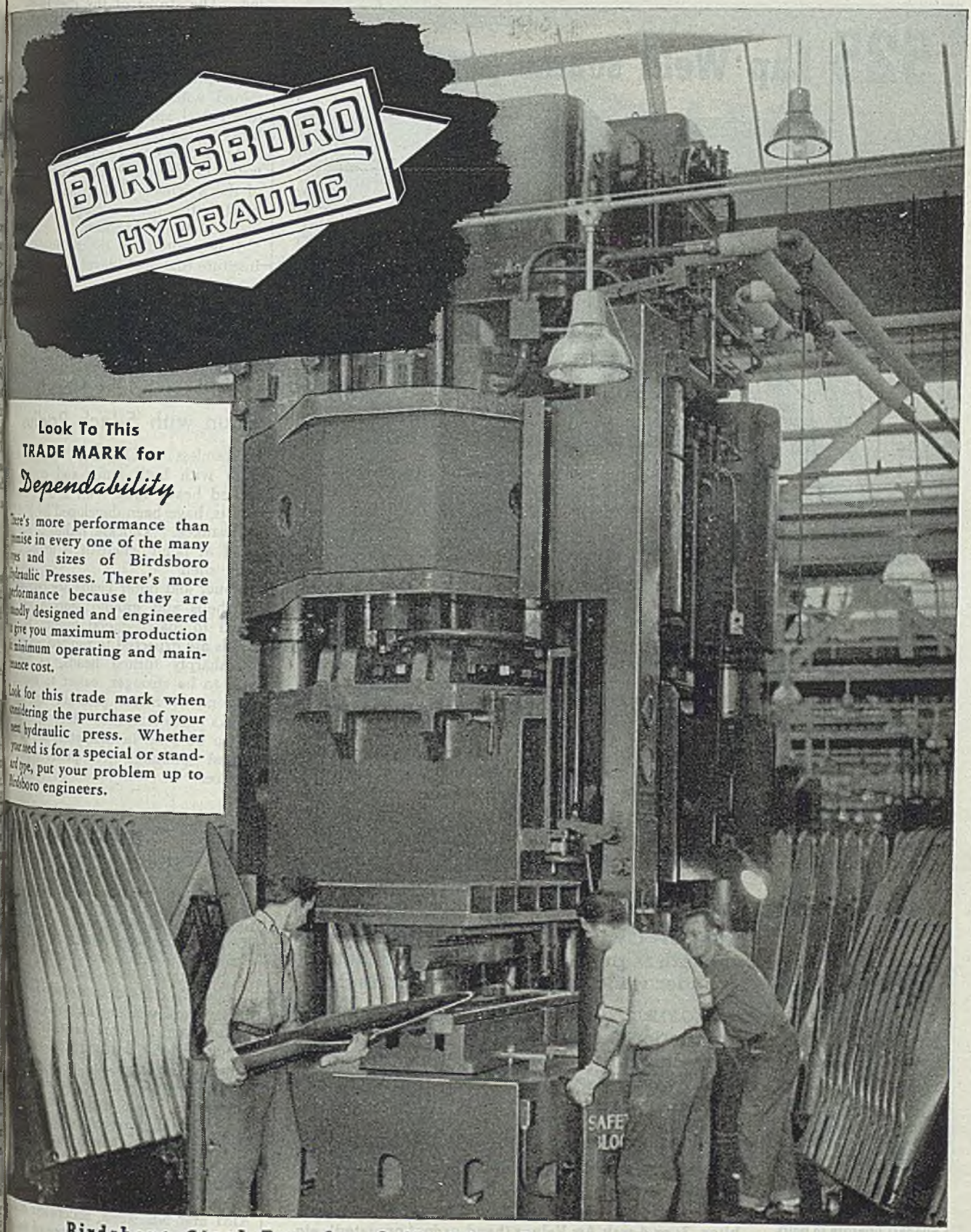
The smaller press, which lends more easily to different setups, was during the war mostly for punching sulating parts for the generator fish paper and hard vulcanized About 20 different dies have been ro through this press, the parts made being required in such volume as laminations produced in the larger chine.

Two brass jobs also have been regularly, using 0.020-in. stock, on small press. Three steel jobs, with al ranging from 0.018 to 0.045-in., also included in the 20 die changes. latter figure of 0.045-in. is about heavy as Ford has run metal in small press and the heaviest gage in the larger press was 0.090-in. which parts were made in peacetime regulator terminals for generator cut

Principal peacetime role of the sm presses was in the making of miscell ous cigar lighter parts and insulators generators, starter switches, regula and terminals.

The presses are fed by the cam ac up to a maximum feed of ¾-in. By u feed rollers the feed can be increa to 3.1416 in. Width of the materia limited to about 8 in., with guide being used in the dies to locate material. Size of the part being ma factured, however, cannot be as l as the area determined by the maxim feed and width, unless it is a cut job without guide pins in the dies.

Feed must be adjusted so that terial will have time to move in wh the dies are swinging apart and cl



Birdsboro Steel Foundry & Machine Company, Birdsboro, Pa.

Representatives in: Cincinnati, Ohio; Indianapolis, Indiana; Kansas City, Missouri; Los Angeles, California; Oklahoma City, Oklahoma; Pittsburgh, Pennsylvania; and Tulsa, Oklahoma.

BIRDSBORO
HYDRAULIC PRESSES

ing. The stroke of the dies by the action ranges from 0 to 1-in.

Considerable variety of metals been used in the Ford-operated speed presses, with successful results tained with electrical grade steel, rolled steel, spring steel, nickel alloy brass and copper.

An interesting feature of the pr is the brake arrangement on the ou of the flywheels which makes it pos to stop the presses from high spee just a matter of seconds.

It is pointed out by the Pressed Institute that such developments pro used may greatly assist end-pro manufacturers in meeting the deman better, lighter competitively priced sumer appliances and equipment.

Stainless Tanks Heads Spun with 5-Inch Radius

Stainless steel milk storage built with both inner and outer dished heads spun with a 5-in. kn radius, have been developed by Hei Milwaukee. Knuckle radius is cur head at point where it is joined t tank shell.

Inner and outer heads are butt-w to shells and ground smooth and ished to match metal finish. Rou heads are expected to replace conve al, sharply turned heads, as they said to be stronger, easier to clean, present a more pleasing appear Tanks with stainless steel spun up to 90½ in. in diameter, some o largest spinnings ever produced, a service.

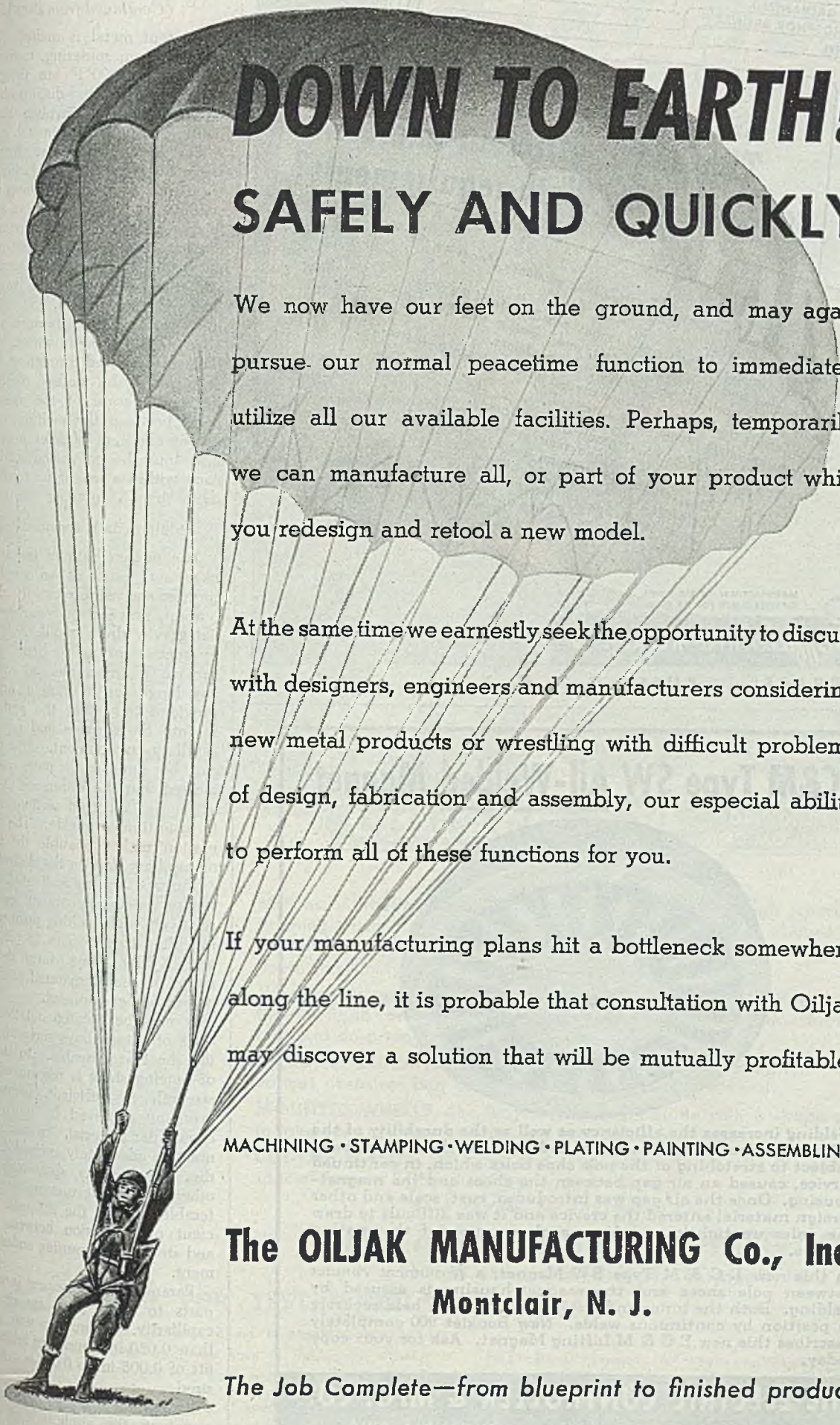
Lincoln Arc Welding Handbook in New Editio

Procedure Handbook of Arc We Design and Practice, eighth edition; ulated leather, 1312 pages 6 x 9 in 1647 illustrations; published by Li Electric Co., Cleveland, for $1.50 i United States, $2 elsewhere.

Entirely revised to include latest on new arc welding methods, the e edition of this work presents detai recent welding methods and techni many of which played an important in winning the war. It contains a w of new information that obsoletes previous literature on welding.

This edition contains new cost and welding techniques, mathema calculations for new weld-designed tures, latest steel specifications on AISI and NE steels, underwater cut shop ventilation, maintenance of we equipment, methods of testing and metal specifications for arc welding trodes.

The several parts cover such sub as: Welding methods and equipm technique of welding; procedure, sp and costs; weld metal and method testing; weldability of metals; welded construction; designing of arc we structures, and typical applications arc welding.



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Flux Bath Brazing

(*Continued from Page* 127)

the parent metal is melted. To d guish it from soldering, temperatur more than 1000°F are thought o brazing heats; to distinguish it welding, brazing involves little o melting of the parent metal.

The process of furnace brazing sentially a recasting of brazing alloy the capillary spaces or joints of th sembly. To permit this, an appro flux must first be used to remove coating from both filler and paren allow the filler to wet the surfaces. will then join with the two sur forming a solid bond. Successful inum brazing depends upon provid good capillary environment. This be borne in mind throughout desig

In detail, the method consists o ing temperature of the assembly point between the melting point parent and that of filler material. heat must be controlled inside th nace within a maximum tolerance more than 5° plus or minus.

Molten Bath Provides Buoyanc

The molten bath of the flux di nace acts both as an agent for transfer and oxide removal and, mo portant, provides buoyancy to help bat gravity drain of filler. It is po by special means, to braze in thi furnace at any angle and with vi any length or position of brazed provided only that the part itsel fit into the furnace and furnishes capillary environment. Flux dip b can be done with parts partiall mersed, but the difference in expa of the hot and cold sections is conc to distortion or buckle. The dippin eration makes possible the induc of capillary flow in the desired dire

Furnace brazing is limited to all low or no copper content because relatively high melting point of the ing alloy itself. The 2S, 3S, 61S and XJ51S alloys form the pra range of useful material at the p period of development.

It may be pointed out that com tions of these alloys surfaced with ing sheet are useable. In fact, th of brazing sheet is recommended, strength is sufficient, because o economy achieved by virtue of cated filler material. In most cases, must be adequately assembled befo dip. Tack rivets, spot welds, tabs other firm connectors are generally ferable to jigs, the difference in c cient of expansion between alum and steel in jigs causing undesired ment.

Paramount requirement is to brin parts to a fit close enough to i capillarity. In ordinary work, gaps than 0.020-in. cannot be tolerated. fits of 0.005-in. to 0.010-in. are to be sired.

Aluminum Brazing Co. has applie a patent, the application of which fords excellent capillary flow in j

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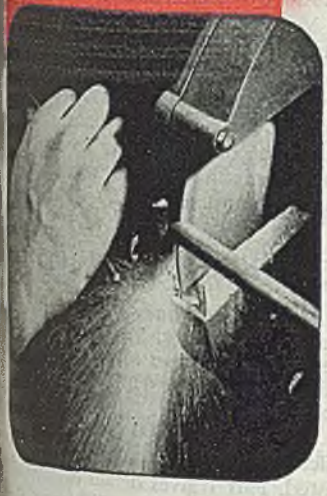

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ordinarily difficult to braze. This consists of a heavy knurl mechanically impressed into one of the two juxtaposed surfaces of sheets. When it is used on either lap or perpendicular joints a series of parallel fillets of great strength are developed during the brazing operation.

Knurled sheet may be pressed into the juxtaposed sheet tightly, providing a series of parallel, nearly half-round capillary ducts, which is not true of ordinary lap joints. The same problem, however, may be overcome with certain applications by means of relieved edges and provision for fillets other than knurling.

Such flux-dip brazing results in a single homogeneous piece of aluminum. A plainer way of expressing the idea is to think of the phrase "recasting into capillary environment."

This method is definitely indicated where work calls for the joining of many small parts with total brazing seams amounting to great lengths. It is not so readily applicable to the joining of large parts where production time is not so important a factor.

Some of its obvious advantages are: (1) Greater neatness of completed joints, (2) accessibility on intricate assemblies, (3) lack of localized heat, hence absence of varying expansions, eliminating buckle, (4) savings in weights, (5) softer, easily formed alloys are annealed and may be concurrently heat-treated during the brazing operation.

Costs Remain Static

Costs remain practically static regardless of the amount of seam included in the assembly, pointing to particular advantage where considerable joining is required in a small space or in a restricted area. It is often possible to braze thin sections easily that are difficult or impossible to join by other methods. Qualities of lightness, workability and strength necessarily arise from the advantages listed above.

One great superiority in the method is reflected in its inherent lowness of cost. This is so where sufficient volume is available to amortize dipping jigs and to facilitate the use of conveyor mechanism for cleaning, preheating and dipping. The most expensive single item encountered is the brazing flux, the heart of the process. Parts therefore should be designed to bring about easy pour-off of molten flux before removal from the brazing chamber.

The following parts, representing a limited selection of a very large potential, lend themselves uniquely to flux dip furnace brazing:

> Radiator and intercooler systems, watertight junction boxes, gasketed and sealed instrument boxes, aircraft carburetor ducts, camera cases, steam heated irons, numerous castings when substitution of cheaper and stronger wrought sections may be indicated, and in general any item requiring considerable joining in relation to its total bulk or requiring simple joining but in production quantities.

Aluminum welding techniques are several years old. Hand methods h heretofore been predominant in the j ing of these light, strong alloys. Fl dip furnace operations, which make greater accuracy and neatness, are well defined doors to future produc of aluminum parts in masses.

Up to now, relatively few compa have studied the flux-dip method of b ing aluminum. Among these may mentioned the Harrison Radiator Divi of General Motors Corp., Lockport Y., and Aluminum Co. of America, Kensington, Pa. The American Wel Society in New York City also has m contributions to the research data. addition, there may be a few other cerns, large and small, which have m progress in the method, but with re still unannounced.

In the opinion of the owners of Aluminum Brazing Co., there ap little doubt but that a vast spurt soon be seen in the use of the operatio aluminum brazing through flux-dip

Handbook on Problems o Machinists and Draftsmen

Machinists' and Draftsmen's Handl by Albert M. Wagener and Harla Arthur; cloth, 662 pages, 5¼ x 8 in published by D. Van Nostrand Co. 250 Fourth Ave., New York, for $

The authors have attempted to pr in one volume of convenient size a erence work for machinists and d men that will contain all the basi formation required in most daily as ments. A critical selection of ma has been made, necessitating omissi much that might be considered im tant, but the effort has been mad present illustrations, examples and tions to standard problems, espe those of a mathematical nature.

Many solutions of elementary m matical problems are presented in tail since while most men in the craft studied mathematics it is quickly gotten by most. Sections devote strength of materials, mechanics logarithms have been revised to latest conditions.

Canadian Mines Listed

Canadian Mines Handbook, paper, 320 pages, 5¼ x 7¼ inches; lished by Northern Miner Press Ltd. Richmond St. West, Toronto, for $1.

In this book 7100 companies and dicates engaged in mining in Canad listed. Part I gives details on 1300 corporations, including 559 formed i past year and Part II deals with others, most of which are quiescent.

A review is given of the positio operating companies in comprehensiv tail, with five-year comparisons of put, earnings and other essential info tion. A long-range table of quotation the Toronto Stock Exchange incl prices to June 30, with schedule brokers' commissions, government t fer taxes, etc.

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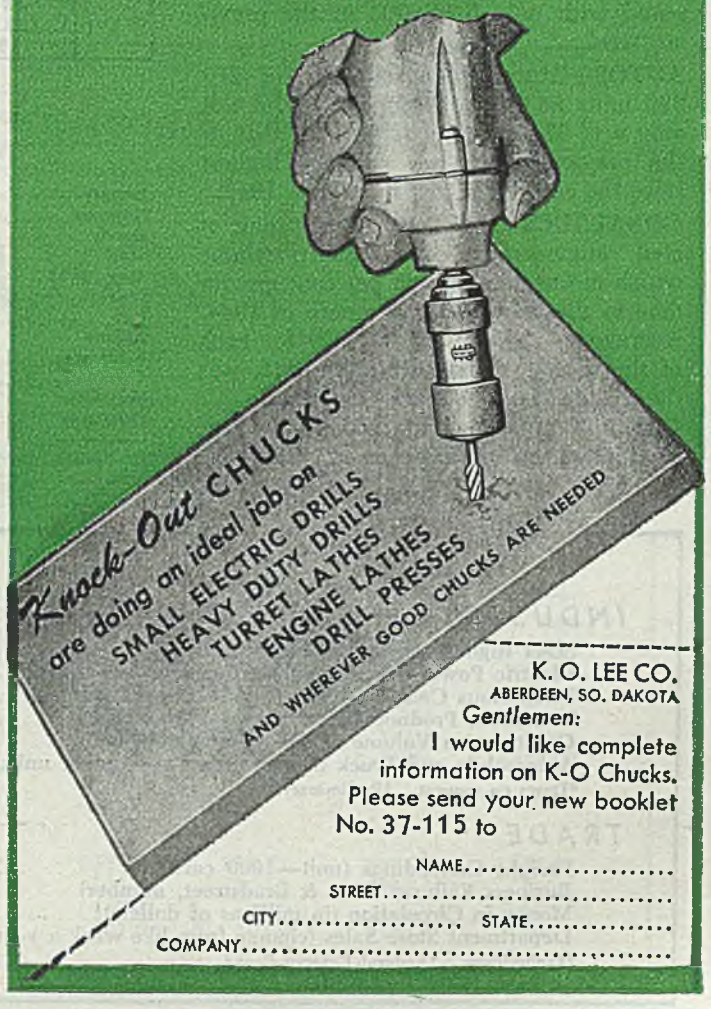

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THE BUSINESS TREND

Notable Gains Are Made In Industrial Activity

NOTABLE gains are being registered in industrial activity now that some of the most crippling strikes have been cleared away.

Backed-up demand for goods is so great that production surges ahead whenever given an opportunity. Hampering of production by labor strife tended to intensify the pent-up demand for goods, although loss of income to employees affected by strikes undoubtedly had some effect, though slight, in retarding the further swelling of demand.

Showing outstanding gains in the latest week were steel ingot production, coal output, and automobile assemblies, all of which in recent weeks had been affected adversely by strikes.

STEEL—With its fuel supply replenished now that coal miners have returned to work, the steel industry is pushing its ingot production rate back toward the high level prevailing before the miners' strike.

COAL—In the first full week of work after the miners' strike, production of bituminous coal jumped 107 per cent over the previous week. Output in the week ended Oct. 27 was 12 million tons, compared with only 5,780,000 in the previous week.

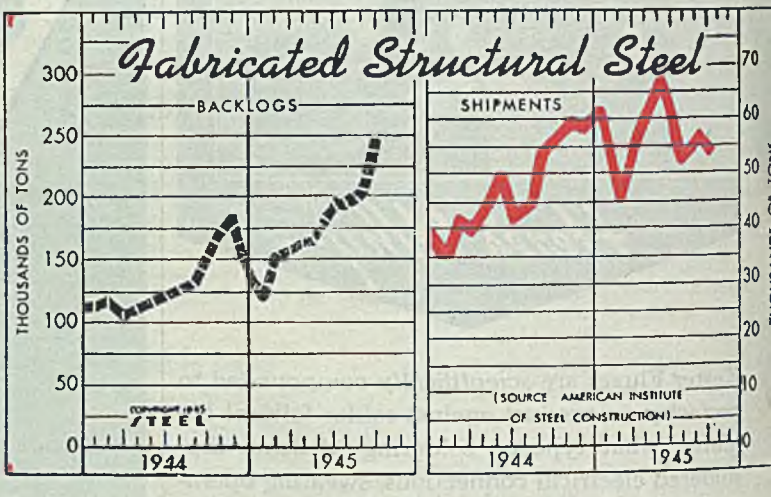
AUTOS—Automobile production of 27,320 units in the week ended Nov. 3 not only was 32 per cent higher than that of the previous week but was the highest since the end of the first quarter of 1942.

CONSTRUCTION—Also encouraging is civil engineering construction volume which in October was 88 per cent greater than in the corresponding month of 1944. Average volume of $59,859,000 for each of the four weeks of October, 1945, was the highest reported since July, 1943.

CASTINGS—Reflecting the end of war, production and shipments of gray iron castings in August reached new low levels for 1945, although the declines from July were moderate. Likewise unfilled orders for gray iron castings in August were a new low for the year. From July, production in August declined 2.7 per cent, shipments 1 per cent, and unfilled orders 7 per cent.

COKE—Also showing a decline is the September coke output which was off 4.2 per cent from August. Production of beehive coke dropped 34.2 per cent from July but output of by-product coke, which represented per cent of the total production, declined only 1.5 per cent.

LIVING COSTS—The second consecutive monthly decline from a 24-year high in living costs for the average family of wage earners and lower-salaried clerical workers in the United States was recorded in September when the decrease was 0.4 per cent, the National Industrial Conference Board reported.



Fabricated Structural Steel
(1000 tons)

	Shipments			Backlogs		
	1945	1944	1943	1945	1944	1
January	55.0	35.2	91.9	124.4	113.1	8
February	47.8	42.9	90.8	151.6	117.6	9
March	58.4	41.4	94.0	153.3	106.3	9
April	59.4	44.5	86.6	162.5	111.2	9
May	67.1	50.7	78.9	165.7	116.3	9
June	63.0	43.0	68.4	195.2	122.7	9
July	54.4	45.3	56.8	194.0	125.4	9
August	56.8	55.2	50.2	201.1	130.4	9
September	53.7	57.5	51.8	248.5	151.1	9
October	....	61.6	80.1	.....	174.4	9
November	....	59.4	42.7	....	184.2	9
December	....	61.3	39.6	.....	142.5	1

Source: American Institute of Steel Construction. Figures represent members' reports o

FIGURES THIS WEEK

INDUSTRY	Latest Period*	Prior Week	Month Ago	Yea Ago
Steel Ingot Output (per cent of capacity)	73	65	82	95.5
Electric Power Distributed (million kilowatt hours)	3,934†	3,937	4,028	4,355
Bituminous Coal Production (daily av.—1000 tons)	2,000	968	1,822	2,035
Petroleum Production (daily av.—1000 bbls.)	4,318	4,273	3,621	4,720
Construction Volume (ENR—Unit $1,000,000)	$87.8	$58.4	$74.7	$32.4
Automobile and Truck Output (Ward's—number units)	27,320	20,675	9,500	21,595

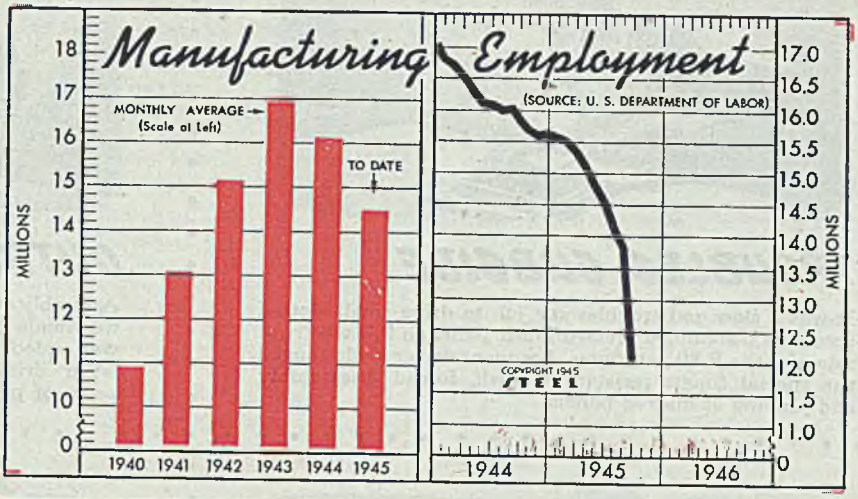
*Dates on request. †Preliminary.

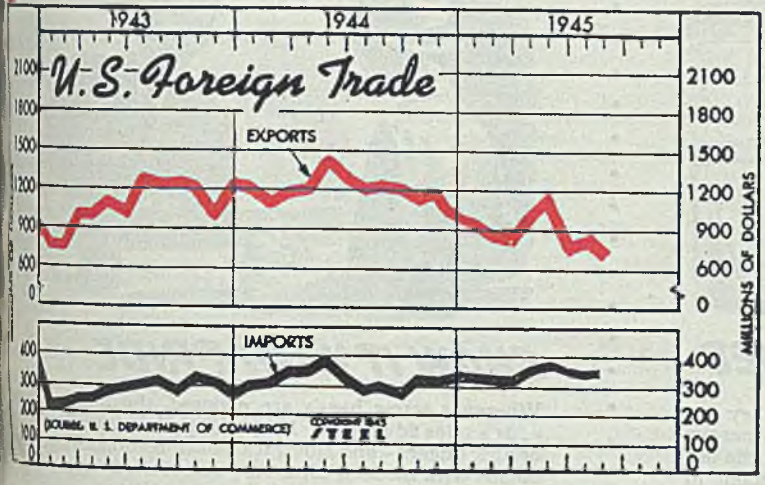
TRADE				
Freight Carloadings (unit—1000 cars)	857†	855	768	$93
Business Failures (Dun & Bradstreet, number)	17	17	13	11
Money in Circulation (in millions of dollars)‡	$28,026	$27,974	$27,853	$24,409
Department Store Sales (change from like week a year ago)‡	+12%	+14%	+7%	+11

†Preliminary. ‡Federal Reserve Board.

Factory Employment
(000 omitted)

	1945	1944	1943
January	15,555	16,825	16,423
February	15,517	16,735	16,599
March	15,368	16,559	16,747
April	15,102	16,309	16,774
May	14,811	16,122	16,753
June	14,538	16,093	16,908
July	14,136	16,013	17,059
August	13,813	16,023	17,182
September ...	12,149	15,843	17,136
October	.....	15,692	17,194
November	.....	15,607	17,238
December ...	.....	15,632	17,080
Monthly Ave...	.....	16,121	16,924



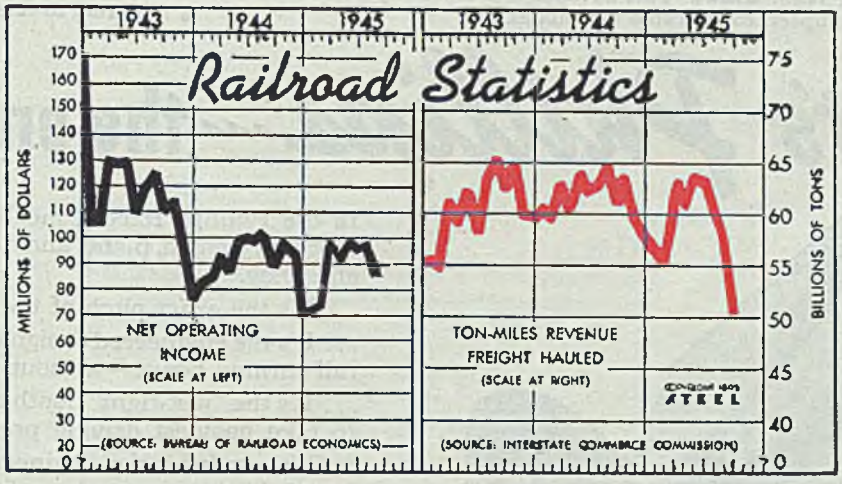


Foreign Trade
Bureau of Foreign and Domestic Commerce
(Unit Value—$1,000,000)

	Exports			Imports		
	1945	1944	1943	1945	1944	1943
Jan.	900	1,124	730	334	300	228
Feb.	882	1,086	719	324	313	234
Mar.	881	1,197	988	324	359	249
Apr.	1,002	1,182	980	366	359	258
May	1,133	1,419	1,085	372	386	281
June	866	1,271	1,002	360	330	295
July	883	1,198	1,262	356	293	300
Aug.	730	1,207	1,204	358	302	315
Sept.	....	1,199	1,235	...	280	285
Oct.	....	1,140	1,195	...	327	329
Nov.	....	1,184	1,074	...	322	317
Dec.	....	934	1,244	...	336	281
Total	....	14,141	12,718	...	3,907	3,372

Statistics of Class I Railroads

	Net Operating Income			Ton-Miles Revenue Freight		
	1945	1944	1943	1945	1944	1943
	—(millions)—			—(billions)—		
Jan.	$73.0	$84.9	$105.3	56.8	60.5	55.1
Feb.	73.2	84.5	105.8	55.3	59.3	54.4
Mar.	99.9	92.5	129.7	62.9	62.7	61.2
Apr.	91.9	87.7	128.7	61.6	60.4	59.1
May	99.9	98.5	129.5	64.6	64.0	62.1
June	96.1	99.8	109.0	63.6	62.0	58.0
July	97.1	98.6	127.8	60.1	62.8	63.7
Aug.	86.7	101.4	132.3	56.4	64.5	65.1
Sept.	....	89.1	110.3	50.4	61.0	62.5
Oct.	....	97.3	113.1	....	63.5	65.0
Nov.	....	91.6	96.4	....	59.4	59.9
Dec.	....	69.8	76.9	....	57.3	60.6
Tot.	.....	$91.3	$113.7	....	61.5	60.6



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$11,358	$11,413	$11,425	$10,629
Federal Gross Debt (billions)	$262.0	$262.0	$262.4	$211.8
Bond Volume NYSE (millions)	$36.3	$28.9	$31.8	$35.9
Stocks Sales, NYSE (thousands)	9,464	6,403	8,744	3,868
Loans and Investments (billions)†	$61.0	$61.1	$61.3	$54.1
United States Gov't. Obligations Held (millions)†	$45,458	$45,471	$45,140	$40,092

*Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$58.27	$58.27	$58.27	$56.73
All Commodities†	105.7	105.5	105.0	103.9
Industrial Raw Materials†	117.4	116.9	115.7	113.5
Manufactured Products†	101.9	101.9	101.8	101.1

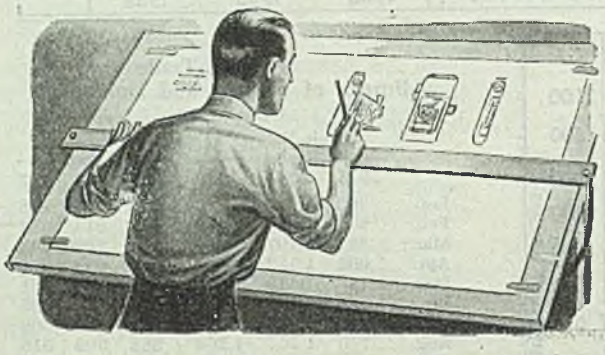
†Bureau of Labor Statistics Index, 1926=100.

TROUBLES SUBSIDE

It was a slow and troublesome job to drive small slotted screws in fastening a pressed fabric panel on this electrical relay for the P-80 Jet Plane. Frequent driver skids gouged the special fungus-resistant varnish, forced disassembly and junking of marred panels.

OUTPUT HITS STRIDE

Assembly of this part was speeded up 400% when a chang was made to Phillips Recessed Head Screws. Fumblin was ended, and a spiral driver could be used, permittin faster driving. Driver skids were eliminated, along wit waste of parts and time for disassembly and reassembl



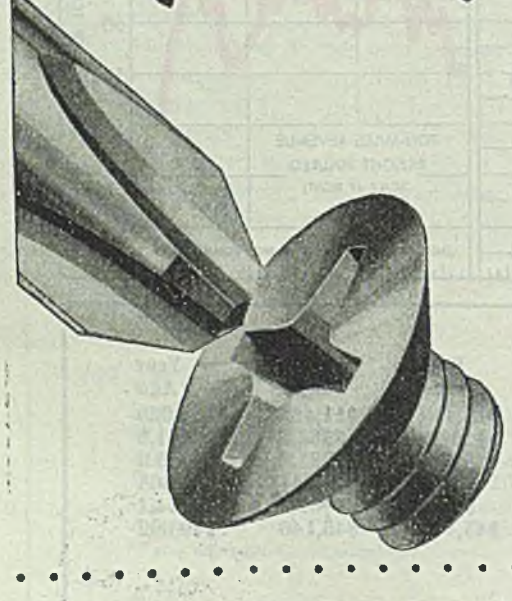
NEW STRENGTH SUPPLIED

Design engineers favor Phillips Screws, because they not only speed output and reduce costs . . . they also permit design improvements that add strength, often with the use of fewer screws. This advantage is especially evident in compact, complicated assemblies.

SHOW IT WITH PRIDE

Wherever screw heads are exposed, the Phillips Rece adds a sales advantage. No unsightly burrs to snag clothi or nick fingers – and sidetrack sales! Its ornamental desi blends with modern contours – and it needs only a quart turn to line up – looks well in any position.

It's Phillips — the engineered recess



In the Phillips Recess, mechanical principles are so correctly ap that every angle, plane, and dimension contributes fully to screw-dr efficiency.

. . . It's the exact pitch of the angles that eliminates driver skids.

. . . It's the engineered design of the 16 planes that makes it easy to a full turning power – without reaming.

. . . It's the "just-right" depth of recess that enables Phillips Screw H to take heaviest driving pressures.

With such precise engineering, is it any wonder that Phillips Sc speed driving as much as 50% – cut costs correspondingly?

To give workers a chance to do their best, give them faster, e driving Phillips Recessed Head Screws. Plan Phillips Screws into product now.

PHILLIPS *Recessed Head* SCREW

WOOD SCREWS • MACHINE SCREWS • SELF-TAPPING SCREWS • STOVE B

Made in all sizes, types and head styles

25 SOURCES

American Screw Co., Providence, R. I.
Atlantic Screw Works, Hartford, Conn.
The Bristol Co., Waterbury, Conn.
Central Screw Co., Chicago, Ill.
Chandler Products Corp., Cleveland, Ohio
Continental Screw Co., New Bedford, Mass.
The Corbin Screw Corp., New Britain, Conn.
General Screw Mfg. Co., Chicago, Ill.
The H. M. Harper Co., Chicago, Ill.
International Screw Co., Detroit, Mich.
The Lamson & Sessions Co., Cleveland, Ohio
Manufacturers Screw Products, Chicago, Ill.
Milford Rivet and Machine Co., Milford, Conn.
The National Screw & Mfg. Co., Cleveland, Ohio
New England Screw Co., Keene, N. H.
Parker-Kalon Corp., New York, N. Y.
Pawtucket Screw Co., Pawtucket, R. I.
Pheoll Manufacturing Co., Chicago, Ill.
Reading Screw Co., Norristown, Pa.
Russell Burdsall & Ward Bolt & Nut Co., Port Chester
Scovill Manufacturing Co., Waterville, Conn.
Shakeproof Inc., Chicago, Ill.
The Southington Hardware Mfg. Co., Southington
The Steel Company of Canada Ltd., Hamilton, C
Wolverine Bolt Co., Detroit, Mich.

HELPFUL LITERATURE

1. Carbide Tipped Tools

Eye-D-Cut Tool Co.—26-page illustrated catalog No. R-20 contains ordering instructions, prices and specifications on complete line of carbide tipped cutting tools. Included in line are tool bits, boring tools, centers, cut-off tools, cutters, milling cutters, roller turning tools, reamer bits and special tools. Engineering data related to machining ferrous, nonferrous and nonmetallic materials are included.

2. Small Turret Lathes

South Bend Lathe Works—12-page illustrated catalog No. 901 covers series 900 and 1000 South Bend turret lathes which have swings of 9 and 10-1/8 inches over beds and saddle wings, respectively, and ½ and 1-inch maximum bar capacities. Standard equipment includes quick lever cross slide and turret, compound rest slide, universal carriage, quick change gear box and coolant equipment.

3. Portable Electric Tools

Skilsaw, Inc.—44-page illustrated catalog of "Portable Electric Skil Tools" gives full specifications of line of portable electric drills, saws, disc sanders, grinders, belt sanders, shears and routers. Hints are given on care and use of portable electric tools to obtain maximum performance and service from them.

4. Acetylene Generator

Sight Feed Generator Co.—16-page illustrated bulletin "Sight Feed Saves 50% to 75% in Acetylene Costs" shows savings which can be effected through use of acetylene generators in small, medium and large shops, as well as in industrial plants using gas welding and cutting equipment.

5. Corrosionproof Materials

U. S. Stoneware Co.—16-page illustrated Bulletin H gives information and applications of corrosion resistant materials and equipment. Included are Tygon formulations, tank and lining materials, flexible tubing, gasketing, paint, cements, chemical stoneware, masonry, mixing equipment and towers and tower packing.

6. Electrical Controls

United Electrical Controls Co.—12-page illustrated condensed catalog and price list No. 1040-C describes thermostats, pressure switches, vacuum switches and close differential switches, and includes ordering information, electrical ratings and other information.

7. Plating Equipment

Udylite Corp.—Three illustrated bulletins describe "Udylite Cathode Rod Agitator," "Udylite Dipping Baskets" and "Udylite Ball Anodes" describe briefly advantages of these plating accessories.

8. Alloy Containers

Rolled Alloys Corp.—12-page illustrated bulletin describes line of fabricated alloy containers and rack holders for handling parts through heat treating, quenching, pickling, degreasing, rust-proofing baths and similar operations. Carburizing boxes and retorts are also shown.

9. Drill Chucks

K. O. Lee Co.—8-page illustrated booklet entitled "Knock-Out Drill Chucks" contains specifications and prices of drill chucks, arbors and adapters which can be used on drills, mills and lathes. Data on disassembling of chucks are also given.

10. Steam Jet Ejectors

Vapor Heater & Mfg. Co.—6-page illustrated bulletin No. 6509 lists industrial applications and presents engineering data on standard single-stage steam jet ejector. This vacuum producing unit is designed for exhausting air, gases or vapors from many types of equipment in numerous industrial processes. Usual economical limit for unit is 26 inches of mercury vacuum, but higher vacuum can be obtained.

11. Blow Torches

Turner Brass Works—Loose-leaf type illustrated bulletin describes blow torches and presents recommended methods of handling and maintaining. Price list is included.

12. Heating Boilers

Titusville Iron Works Co.—8-page illustrated bulletin No. B-3000 contains diagrams and engineering data on both hand and mechanically fired boilers. Specifications, dimensional tables and structural features are included for nineteen sizes designed for use with all fuels and all types of firing.

13. Nonferrous Forgings

Titan Metal Mfg. Co.—8-page illustrated folder, bulletin No. 145, shows typical hot pressed brass and bronze forgings. Advantages are outlined.

14. Crush Form Grinding

Thompson Grinder Co.—16-page illustrated booklet is entitled "Facts About Crush Form Grinding Precision Contours". Development, applications and advantages of "Thompson Truforming" on surface grinders engineered for crush form contour grinding are covered.

15. Spot Welding

Taylor-Winfield Corp. — 8-page illustrated bulletin SP-8 "Single Impulse and Pulsation Spot Welding of Low Carbon Steel" describes equipment, setup and procedure for this type of welding. Welding data charts are included.

16. Gas Quenching

Surface Combustion Corp.—4-page illustrated bulletin SC-126 describes "Surface Super-fast Gas Quench" for use where rates faster than air but slower than oil are required. Technical data are included and charts describe process.

17. Angle Beveling Machine

Thomas Machine Mfg. Co.—4-page illustrated bulletin No. 308 covers specifications of angle beveling machine for handling angles up to 10 x 8 x 1-inch; 12-inch channels with 4-inch flange; bulb angles up to 10 inches with 5-inch flange; and Z bars with 6-inch to 10-inch web and 3½-inch to 4-inch flange.

18. Threadcutting Screws

Shakeproof, Inc.—4-page illustrated folder No. 5 shows typical applications of Shakeproof type 1 thread-cutting screws. These fastening devices cut their own threads in metal of any thickness and remain tightly in place.

19. Industrial Furnaces

W. S. Rockwell Co.—Three illustrated bulletins Nos. 419, 417 and 413-G contain descriptions of gas, oil or electric roller hearth furnaces; Kleenmetal oven furnaces for use with protective atmospheres; and standard gas-fired oven furnaces, respectively. Operational advantages, specifications, typical uses and other data are included.

20. Special Rolled Shapes

Lukenweld, Inc.—8-page illustrated booklet No. 272 describes company's facilities for producing rolled shapes ranging from 10 to 30 ft. in length, 4 to 18 in. in width and 1 to 5½ in. in thickness. Carbon and alloy steels as well as nonferrous metals are used.

21. Belt Matching Machine

Smith Power Transmission Co.—4-page illustrated bulletin No. FVM-124 describes Flexoid V-belt matching machine which provides means for measuring length of V-belt under tension equivalent to operating condition. This makes possible use of matched sets of V-belts to yield maximum life and performance.

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22. Grinding Wheels

Sterling Grinding Wheel Div., Cleveland Quarries Co.—12-page illustrated booklet presents in cartoon form "Do's" and "Don't's" in handling grinding wheels. Brief descriptions of Sterling grinding wheels are given.

23. Motor Pulleys

Lewellen Mfg. Co.—12-page illustrated catalog No. 40 presents data on variable speed motor pulleys and combination pulleys. Motor speeds and ratings, approximate shipping and net weights, table of belt centers, and dimensions of motor pulley, countershaft unit and adjustable speed pulley are covered.

24. Ring Gaskets

Steel Improvement & Forge Co.—8-page illustrated bulletin No. 45 deals with Gruv-Seal forged iron and alloy ring gaskets to provide pressureproof joints. Features are discussed, standard and special stock sizes are listed, and list prices are included.

25. Boring Tools

State Mfg. & Construction Co.—4-page illustrated folder "Dialset Boring Tools for Production and Economy in Precision Boring" describes boring tool consisting of adapter and three, four or five standard interchangeable inserts designed for specific requirements. Details and dimensions are covered.

26. Stainless Strip Steel

Superior Steel Corp.—30-page illustrated brochure "Superior Stainless Strip Steels" covers properties, analyses and uses of stainless steel strips. It is prepared for designers and fabricators who wish to use them in products. Tables of weights, corrosion resistance and physical and mechanical properties are included.

27. Manufacturing Facilities

Steel Products Engineering Co.—20-page illustrated bulletin describes engineering and manufacturing facilities of this company which are available for the production of precision metal parts, assemblies and complete machines.

28. Conveyors

Standard Conveyor Co.—12-page illustrated bulletin No. 66 contains views of various types of conveying equipment in actual use. Gravity and power operated roller conveyors, pneumatic tube service, spiral chutes and belt conveyors are included.

29. Bronze Products

Shook Bronze Corp.—16-page illustrated catalog No. 45 lists physical characteristics, nominal chemical analysis and specifications of bronze bushings, bearings, bar stock and babbitt. Application information is included on all forms of this alloy material.

30. Protective Coating

United Chromium, Inc.—4-page illustrated bulletin "Unichrome Dip" describes protective material and procedure for black and olive drab coatings. Process protects zinc and cadmium against corrosion in single dipping operation at room temperature.

31. Inspection Magnifier

George Scherr Co.—4-page illustrated bulletin describes Magni-Ray lighted inspection magnifying unit which is adaptable to wide range of checking, assembling, inspection and safety purposes.

32. Electric Timers

C. H. Stoelting Co.—4-page illustrated bulletin No. 1100 describes table and wall model stop clocks, precision chronoscopes, combination timers and impulse counters, and spring wound x-ray timers. Circuit diagrams showing correct methods of connecting timers in various test circuits are included.

33. Materials Handling

Towmotor Corp.—36-page illustrated pocket-size booklet "Materials Handling Analysis Guide" discusses materials handling from executive viewpoint. Three sections of booklet are: "How to Tell If You Need Better Handling Methods", "Analyzing the Problem", and "Determining the Solution to Your Problem".

34. Twist Drills

Republic Drill & Tool Co.—156-page
trated catalog No. 4-D contains list pric
specifications on line of twist drills whi
cludes high speed taper shank, straight
automotive, aircraft, combination, Coe's,
& Deming, ratchet and roll forged drills
drivers for shankless forged drills, carbo
drills, sleeves and sockets, and special
drills are covered. Manufacturing facili
plant are described and technical sectio
sents engineering data.

35. Industrial Ovens

Gehnrich Oven Div., W. S. Rockwell
12-page illustrated bulletin No. 115 de
Gehnrich line of ovens for uniform heat
ment of ferrous and nonferrous products.
are adaptable for aging, air tempering,
ing, bluing, drawing, heat treating, norm
preheating, stress relieving and other hea
esses to 1250 F.

36. Variable Speed Drive

Reeves Pulley Co.—20-page illustrated
No. V-440 contains complete data
Reeves Vari-Speed motor pulley which
in eleven sizes for transmitting from ⅛
power to 15-horsepower and provides
speed adjustability over ratios of 2¼:1
Engineering and application information
cluded.

37. Extruded Aluminum

Reynolds Metals Co., Aluminum D
page bulletin No. 35-A lists manufa
methods, alloys and tempers, dimensiona
ances, chemical composition, physical pr
and other engineering data on comple
of aluminum extruded shapes.

38. Needle Bearings

Torrington Co.—153-page illustrated
Bearing Engineering and Application
handbook, edition No. 32, supplies p
information on various types of needle b
Typical applications of these bearings are
Specifications, tolerances, design factors,
lation and inspection data, standards an
data are included.

39. Production Facilities

Searles Electric Welding Works—
illustrated bulletin entitled "Contract
tion Facilities at Searles" shows typical
fabricated shapes and parts produced b
pany. Welding technique employed and
able equipment for contract productio
described.

40. Hydraulic Pump

Sundstrand Pump Div., Sundstrand M
Tool Co.—4-page illustrated bulletin, fo
125, describes hydraulic pumping unit f
low pressure large volume and high p
small volume. Principle of Roto-Roll
description, dimensions, specifications and
applications are covered.

41. Tangent Bender

Struthers Wells Corp.—16-page illu
bulletin describes Single Wing, Double Wi
newly developed Stretch Wing tangent
machines. Engineering information, speci
tures of machines and product shapes a
signs that can be formed in single operati
included. Silent and automatic, machin
used for bending sheet metal.

42. Toolroom Furnaces

Lindberg Engineering Co.—4-page
strated bulletin No. 160 presents deta
line of gas-fired toolroom box type fu
for tempering and heat treating ope
utilizing temperatures from 250 to 12
These furnaces are especially suited for te
ing or preheating of tools, dies and other
parts.

43. Scales in Industry

Toledo Scale Co.—20-page illustrated
chure No. 1014 is entitled "Back-Groun
Victory". Details are presented on how
pany's research contributed to mass produ
by industry of the materials and weapo
Victory. Applications of scales in war p
process industries and other fields are al

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Mills Schedule Closely To Spread Steel Equitably

Quotas more general as demand overflows . . .
Orders screened to give best distribution . . .
Production shows further gain

ALTHOUGH steel demand is overwhelming, producers are making headway in setting up orderly schedules, mainly by restricting tonnage accepted, through establishment of quotas and use of other selective measures,

Some mills are virtually out of the market on the theory that it is better to digest what they have than to make delivery promises with little assurance they can be kept. As a partial result, mill backlogs are not as heavy as during the war. One leading producer of diversified products estimates backlogs at seven months on the basis of theoretical 100 per cent operation, against six months at the war peak. Also contributing to this situation is the lighter character of tonnage, reflecting the shift in emphasis from heavy ordnance and ship work to lighter civilian needs.

Another factor having influence is restraint on the part of prospective buyers, as a result of the unsettled labor outlook, most noticeable in building construction, which draws considerably on heavier steel products. Here it is not only the labor situation, which is bearing on costs and deliveries, but shortage of draftsmen and estimators. Much more construction business is coming out than can be figured.

In spite of progress in setting up orderly schedules much remains to be done, consumer pressure for steel is being stimulated by a possible early increase in prices. Demand for steel is heavy from practically all sides and employment of selective measures in many cases is difficult. Various mills, where they could find nothing else could be done, as in light flat-rolled products in particular, started establishment of quotas rather late, making the task especially hard. Others, who are picking and choosing, although still trying to extend some help to as many buyers as possible, have trouble keeping schedules from becoming too much extended.

Some producers of sheets and strip, who have been restricting scheduling for next year to first quarter only, are limiting it even further, setting it up on a monthly basis wherever possible. There also is greater disposition to set up sheet specialties, such as electrical sheets on a quota basis and there is possibility this may be extended to polished stainless sheets. Some producers already are booked into June on polished material and the likelihood is that if quotas are established they will be made effective for second half, as has been done in at least one or two cases in narrow hot strip.

Steelmaking operations continue the climb from the low point reached during the coal strike, the estimated national rate for last week being 76 per cent of capacity, a gain of three points from the prior week. Chicago made the largest gain, 8½ points to 82 per cent, with Pittsburgh gaining 2½ points to 75 per cent. Buffalo advanced 4½ points to 86, Youngstown 1 point to 55, Cincinnati 6 points to 77 and New England 2 points to 82 per cent. Wheeling receded 1½ points to 85 and Cleveland 2 points to 81. Rates were unchanged as follows: St. Louis 68, eastern Pennsylvania 74, Birmingham 95 and Detroit 88.

While no distress has resulted from lack of scrap, supply is tight and melters are seeking tonnage eagerly, in part to provide reserves for winter. Steelmakers are taking premium grades for open-hearth melting and are paying additional freight equalization for remote scrap. Industrial scrap is in short supply, as is material made available from war contract settlements.

Railroad buying is increasing, the outstanding purchase last week being 156,000 tons of steel rails for 1946 delivery, by the Pennsylvania railroad, distributed among three producers. Later purchase will cover approximately 50,000 tons of accessories.

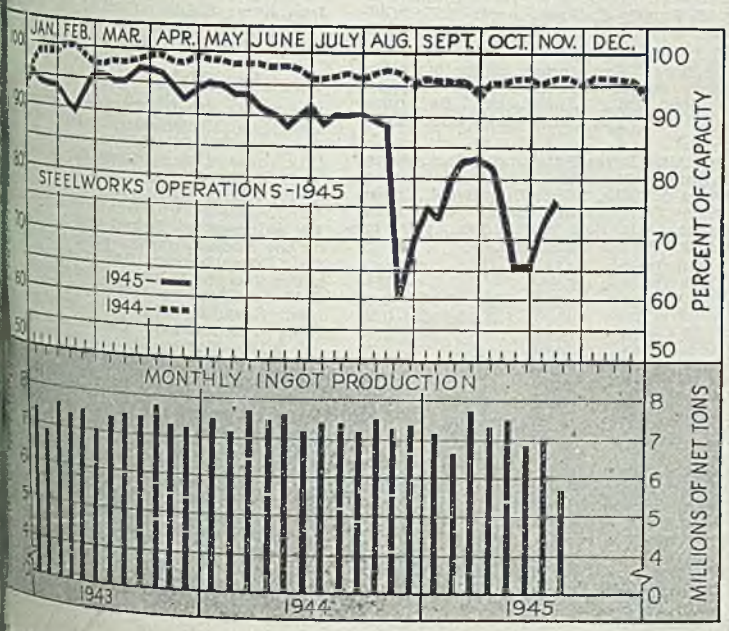
With ceiling prices maintained, average composite prices of steel and iron products are unchanged, finished steel composite being $58.27, semifinished steel $37.80, steelmaking pig iron $24.80 and steelmaking scrap $19.17.

DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Nov. 10	Change	Same Week 1944	Same Week 1943
Pittsburgh	75	+2.5	91.5	99
Chicago	82	+8.5	100.5	101.5
Eastern Pa.	74	None	95.5	95
Youngstown	55	+1	88	95
Wheeling	85	—1.5	91	99
Cleveland	81	—2	93	94.5
Buffalo	86	+4.5	90.5	70
Birmingham	95	None	90	84
New England	82	+2	88	95
Cincinnati	77	+6	87	91
St. Louis	68	None	75	93
Detroit	88	None	87	94
Estimated national rate	76	+3	96.5	99

*Based on steelmaking capacities as of these dates.



COMPOSITE MARKET AVERAGES

	Nov. 10	Nov. 3	Oct. 27	One Month Ago Oct., 1945	Three Months Ago Aug., 1945	One Year Ago Nov., 1944	F Yea Nov
Finished Steel	$58.27	$58.27	$58.27	$58.27	$58.27	$56.73	$5
Semifinished Steel	37.80	37.80	37.80	37.80	37.80	36.00	
Steelmaking Pig Iron..	24.80	24.80	24.80	24.25	24.05	23.05	
Steelmaking Scrap	19.17	19.17	19.17	19.17	19.17	16.40	

Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Comp Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago. Cleveland, Neville Island, Granite City and Youngstown. St Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net ton gross tons.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for last Month, Three Months and One Year Ago

Finished Material	Nov. 10, 1945	Oct., 1945	Aug., 1945	Nov., 1944
Steel bars, Pittsburgh	2.25c	2.25c	2.25c	2.15c
Steel bars, Philadelphia	2.57	2.57	2.57	2.47
Steel bars, Chicago	2.25	2.25	2.25	2.15
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.215	2.215	2.215	2.215
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.25	2.25	2.25	2.10
Plates, Philadelphia	2.30	2.30	2.30	2.15
Plates, Chicago	2.25	2.25	2.25	2.10
Sheets, hot-rolled, Pittsburgh	2.20	2.20	2.20	2.10
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Pittsburgh	3.70	3.70	3.70	3.50
Sheets, hot-rolled, Gary	2.20	2.20	2.20	2.10
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Gary	3.70	3.70	3.70	3.50
Bright bess., basic wire, Pittsburgh	2.75	2.75	2.75	2.60
Tin plate, per base box, Pittsburgh	$5.00	$5.00	$5.00	$5.00
Wire nails, Pittsburgh	2.90	2.90	2.90	2.55

Semifinished Material				
Sheet bars, Pittsburgh, Chicago	$36.00	$36.00	$36.00	$34.00
Slabs, Pittsburgh, Chicago	36.00	36.00	36.00	34.00
Rerolling billets, Pittsburgh	36.00	36.00	36.00	34.00
Wire rods, No. 5 to ⅜-inch, Pitts.	2.15	2.15	2.15	2.00

Pig Iron	Nov. 10. 1945	Oct., 1945	Aug., 1945
Bessemer, del. Pittsburgh	$26.94	$26.35	$26.19
Basic, Valley	25.25	24.65	24.50
Basic, eastern del. Philadelphia	27.09	26.53	26.34
No. 2 fdry., del. Pitts., N.&S. Sides	26.44	25.85	25.69
No. 2 foundry, Chicago	25.75	25.15	25.00
Southern No. 2, Birmingham	22.13	21.57	21.38
Southern No. 2 del. Cincinnati	26.05	25.50	25.30
No. 2 fdry., del. Philadelphia	27.59	27.03	26.84
Malleable, Valley	25.75	25.15	25.00
Malleable, Chicago	25.75	25.15	25.00
Lake Sup., charcoal del. Chicago	37.34	37.34	37.34
Gray forge, del. Pittsburgh	25.94	25.35	25.19
Ferromanganese, del. Pittsburgh	140.00	140.26	140.33

Scrap			
Heavy melting steel, No. 1 Pittsburgh	$20.00	$20.00	$20.00
Heavy melt, steel, No. 2, E. Pa.	18.75	18.75	18.45
Heavy melting steel, Chicago	18.75	18.75	18.75
Rails for rolling, Chicago	22.25	22.25	22.25
No. 1 cast, Chicago	20.00	20.00	20.00

Coke			
Connellsville, furnace, ovens	$7.50	$7.50	$7.50
Connellsville, foundry ovens	8.25	8.25	8.25
Chicago, by-product fdry., del.	13.35	13.75	13.75

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 1945. The schedule covers all iron or steel ingots, all semifinished iron or steel products, all finished hot-rolled, cold-rolled iron or steel and any iron or steel product which is further finished by galvanizing, plating, coating, drawing, extruding, etc., although only principa lished basing points for selected products are named specifically. Seconds and off-grade products are also covered. Exceptions applying to i companies are noted in the table. Finished steel quoted in cents per pound.

Semifinished Steel

Gross ton basis except wire rods, skelp.

Carbon 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, Buffalo, 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, Ill; Laclede Steel Co., $34 Alton or Madison, Ill.; Wheeling Steel Corp. $36 base, billets for lend-lease, $34, Portsmouth, O., on slabs on WPB directives. Granite City Steel Co. $47.59 gross ton slabs from D.P.C. mill. Geneva Steel Co., Kaiser Co. Inc., $58.64, Pac. ports.)

Forging Quality Blooms, Slabs, Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $42, Detroit, del. $44; Duluth, 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., Kaiser 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. (Kaiser Co. Inc., $76.64, f.o.b. Los Angeles.)

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $54, del. Detroit $56, Eastern Mich. $57.
Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $36. (Wheeling Steel Corp. $37 on lend-lease sheet bars, $38 Portsmouth, O., on WPB directives; Empire Sheet & Tin Plate Co., Mansfield, O., carbon sheet bars, $39, f.o.b. mill.)
Skelp: Pittsburgh, Chicago, Sparrows Point, Youngstown, Coatesville, lb., 1.90c.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, 5—⅝ in. inclusive, per 100 lbs., $2.15 Do., over ⅜—$\frac{47}{64}$-in., incl., $2.30; Galveston, base, 2.25c and 2.40c, respectively. Worcester add $0.10; Pacific ports $0.50 (Pittsburgh Steel Co., $0.20 higher.)

Bars

Hot-Rolled Carbon Bars and Bar-Size Shapes under 3: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham base 20 tons one size, 2.25c; Duluth, base 2.35c; 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 2.55c, Chicago base; Sheffield Steel Corp., 2.75c, f.o.b. St. Louis.)

Rail Steel Bars: Same prices as for hot-rolled carbon bars except base is 5 tons.
(Sweet's Steel Co., Williamsport, Pa., may quote rail steel merchant bars 2.33c f.o.b. mill.)

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 2.70c; 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 Series	(*Basic O-H)	AISI Series	(*Basic O-H)
1300	$0.10	4100 (.15-.25 Mo)	0.70
		(.20-.30 Mo)	0.75
2300	1.70	4300	1.70
2500	2.55	4600	1.20
3000	0.50	4800	2.15
3100	0.85	5100	0.35
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 acid open-hearth; 0.50 electric.

Cold-Finished Carbon Bars: Pittsburgh, Chicago, 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 freight on hot-rolled bars from Pittsburgh to Spring City, New England Drawn Steel Co. may sell outside New England on WPB directives at 2.65c, Mansfield, Mass., plus on hot-rolled bars from Buffalo to Ma
Cold-Finished Alloy Bars: Pittsburgh, Gary, Cleveland, Buffalo, base 3.35c; del. 3.45c; Eastern Mich. 3.50c.

Reinforcing Bars (New Billet): Pi Chicago, Gary, Cleveland, Birmingha rows Point, Buffalo, Youngstown, ba Detroit del. 2.25c; Eastern Mich. an 2.30c; Gulf ports, dock 2.50c; Pacif dock 2.55c.

Reinforcing Bars (Rail Steel): Pittsbur cago, Gary, Cleveland, Birmingham, town, Buffalo base 2.15c; Detroit, de Eastern Mich. and Toledo 2.30c; Gu dock 2.50c.

Iron Bars: Single refined, Pitts. 4.40c refined 5.40c; Pittsburgh, staybolt, 5.7 Haute, single ref., 5.00, double ref., 6

Sheets, Strip

Hot-Rolled Sheets: Pittsburgh, Chicago Cleveland, Birmingham, Buffalo, You Sparrows Pt., Middletown, base 2.20c; City, base 2.30c; Detroit del. 2.30c; Mich. 2.35c; Phila. del. 2.37c; New Y 2.44c; Pacific ports 2.75c.
(Andrews Steel Co. may quote hot-rolle for shipment to Detroit and the Detr on the Middletown, O., base; Alan Wo Co., Conshohocken, Pa., may quote 2 hot carbon sheets, nearest eastern basing
Cold-Rolled Sheets: Pittsburgh, Chicago land, Gary, Buffalo, Youngstown, Mid base, 3.05c; Granite City, base 3.15c; del. 3.15c; Eastern Mich. 3.20c; New Y 3.39c; Phila. del. 3.37c; Pacific ports
Galvanized Sheets, No. 24: Pittsburg cago, Gary, Birmingham, Buffalo, You Sparrows Point, Middletown, base 3.70c ite City, base 3.80c; New York del. Phila. del. 3.78c; Pacific ports 4.25c.
(Andrews Steel Co. may quote ga sheets 3.75c at established basing poin
Corrugated Galv. Sheets: Pittsburgh, C Gary, Birmingham, 29 gage, per squar
Culvert Sheets: Pittsburgh, Chicago, Birmingham, 16 gage not corrugated, alloy 3.60c; Granite City 3.70c; Pacific 4.25c; copper iron, 3.90c; pure iron 3.85c coated, hot-dipped, heat-treated, No. 24 burgh, 4.25c.

...ing Sheets: 10-gage; Pittsburgh, Chi-...ar, Gary, Cleveland, Youngstown, Middle-...n base 2.85c; Granite City, base 2.95c; ...it, del. 2.95c; eastern, Mich. 3.00c: Pa-...ic ports 3.50c; 20-gage; Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, ...e 3.45c; Detroit del. 3.55c; eastern Mich. ...: Pacific ports 4.10c.

...rical Sheets No. 24:

	Pittsburgh Base	Pacific Ports	Granite City
...l grade	3.30c	4.05c	3.30c
...ure	3.65c	4.40c	3.75c
...rical	4.15c	4.90c	4.25c
...	5.05c	5.80c	5.15c
...mo	5.75c	6.50c	5.85c
...sformer			
...	6.25c	7.00c	....
...	7.25c	8.00c	.....
...	7.75c	8.50c	.....
...	8.55c	9.30c	.....

...-Rolled Strip: Pittsburgh, Chicago, Gary, ...eland, Birmingham, Youngstown, Middle-...n, base 1 ton and over, 12 inches ...and less 2.10c; Detroit del. 2.20c; Eastern ... 2.25c; Pacific ports 2.75c

...d Rolled Strip: Pittsburgh, Cleveland, ...ngstown, 0.25 carbon and less 2.80c; Chi-... base 2.90c; Detroit, del. 2.90c; Eastern ... 2.95c; Worcester base 3.00c.

...modity C. R. Strip: Pittsburgh, Cleveland ...ngstown, base 3 tons and over, 2.95c; ...ago 3.05c; Detroit del. 3.05c; Eastern ... 3.10c; Worcester base 3.25c.

...d Finished Spring Steel: Pittsburgh, Cleve-... bases, add 20c for Worcester; .26-.50 ... 2.80c; .51-.75 Carb., 4.30c; .76-1.00 ... 6.15c; over 1.00 Carb., 8.35c.

..., Terne Plate

...Plate: Pittsburgh, Chicago, Gary, 100-lb. ... box, $5.00; Granite City $5.10.

...rolytic Tin Plate: Pittsburgh, Gary, 100-...ase box, 0.25 lb. tin, $4.35; 0.50 lb. tin, ... 0.75 lb. tin $4.65; Granite City, $4.45, ... $4.75, respectively

... Mill Back Plate: Pittsburgh, Chicago, ..., base 29 gage and lighter, 3.05c; Granite ... 3.15c; Pacific ports, boxed, 4.05c.

... Ternes: Pittsburgh, Chicago, Gary, No. ...assorted 3.80c; Pacific ports 4.55c.

...ufacturing Ternes: (Special Coated) Pitts-..., Chicago, Gary, 100-base box $4.30; ...ite City $4.40.

... Ternes: Pittsburgh base per pack-... 112 sheets; 20 x 28 in., coating I.C. 8-lb. ...; 15-lb. $14.00; 20-lb. $15.00; 25-lb. $16; ... $17.25; 40-lb. $19.50.

...lates

...on Steel Plates: Pittsburgh, Chicago, ...Cleveland, Birmingham, Youngstown, ...rows Point, Coatesville, Claymont, 2.25c; ... York, del. 2.44c; Phila., del. 2.30c; ... 2.49c; Boston, del. 2.57-82c; Pacific ... 2.80c; Gulf ports, 2.60c.

...e City Steel Co. may quote carbon ... 2.25c f.o.b. mill; 2.65c f.o.b. D.P.C. ... Co. Inc., 3.20c, f.o.b. Los Angeles. ... Iron & Steel Co. 2.50c f.o.b. basing ... Geneva Steel Co., Provo, Utah, 3.20c, ... Pac. ports.)

... Plates: Pittsburgh, Chicago, 3.50c; ... ports, 4.15c; Gulf ports, 3.85c.

...-Hearth Alloy Plates: Pittsburgh, Chi-..., Coatesville, 3.50c; Gulf ports 3.95c; ... ports 4.15c.

...apes

...ural Shapes: Pittsburgh, Chicago, Gary, ...ham, Buffalo, Bethlehem, 2.10c; New ... del. 2.27c; Phila., del. 2.215c; Pacific ... 2.75c; Gulf ports, 2.45c.

...g

...urgh, Chicago, Buffalo 2.40; Pacific ports,

...e Products, Nails

... Pittsburgh, Chicago, Cleveland, Birm-... to manufacturers in carloads.

... basic, bessemer wire	°2.75c
... wire	°‡3.35c

...Products to the Trade:

...d and cement-coated wire nails, ... staples, 100-lb. keg, Pittsburgh, Chicago, Birmingham, Cleveland, ...; Pac. ports $3.40; galvanized, ... and $3.05, resp.

...d Merchant quality wire, 100-..., Pittsburgh, Chicago, Cleveland, ...ingham .... ††$3.20

...ized Merchant quality wire, 100-..., Pittsburgh, Chicago, Cleveland, ...ingham .... ††$3.55

... fence, 15½ gage and heavier, ... base column 67

... wire, 80-rod spool, Pittsburgh, Chicago, ...and, Birmingham, column 72; twisted ... wire, column 72.

...burgh Steel Co., 0.20c higher; add ... for Worcester, 1 cent for Duluth; add ... for bright, annealed or galvanized and ... for other finishes for Pacific ports. ... bases as for bright basic except Bir-...

... 10 cents for Worcester; 50 cents for ... bright basic and 70 cents for all other ... for Pacific ports.

Tubular Goods

Welded Pipe: Base price in carloads, threaded and coupled to consumers about $200 per net ton. Base discounts on steel pipe Pittsburgh and Lorain, O.; Gary, Ind. 2 points less on lap weld, 1 point less on butt weld. Pittsburgh base only on wrought iron pipe.

Butt Weld

Steel In.	Blk.	Galv.	Iron In.	Blk.	Galv.
⅛	56	33	½	24	3½
¼ & ⅜	59	40½	¾	30	10
½	63½	51	1-1¼	34	16
¾	66½	55	1½	38	18½
1-3	68½	57½	2	37½	18

Lap Weld

Steel In.	Blk.	Galv.	Iron In.	Blk.	Galv.
2	61	49½	1¼	23	3½
2½-3	64	54½	1½	28½	10
3½-6	66	54½	2	30½	12
7-8	65	52½	2½-3½	31½	14½
9-10	64½	52	4	33½	18
11-12	63½	51	4½-8	32½	17
			9-12	28½	12

Boiler Tubes: Net base prices per 100 feet f.o.b. Pittsburgh in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

O.D Sizes	B.W.G	—Seamless— Hot Rolled	Cold Drawn	—Lap Weld— Steel	Char-coal Iron
1"	13	$ 7.82	$ 9.01	.....	.....
1¼"	13	9.26	10.67	.....	.....
1½"	13	10.23	11.72	$ 9.72	$23.71
1¾"	13	11.64	13.42	11.06	22.93
2"	13	13.04	15.03	12.38	19.35
2¼"	13	14.54	16.76	13.79	21.63
2¼"	12	16.01	18.45	15.16	.....
2½"	12	17.54	20.21	16.58	26.57
2¾"	12	18.59	21.42	17.54	29.00
3"	12	19.50	22.48	18.35	31.38
3½"	11	24.63	28.37	23.15	39.81
4"	10	30.54	35.20	28.66	49.90
4½"	10	37.35	43.04	35.22	.....
5"	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. railroad 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

Tool Steels: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb.; Reg. carbon 14.00c; extra carbon 18.00c; special carbon 22.00c; oil-hardening 24.00c; high car.-chr. 43.00c.

Tung	Chr.	Van.	Moly.	Base, per lb.
18.00	4	1	..	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.

Type	Bars	Plates	Sheets	H. R. Strip	C. R. Strip
CHROMIUM NICKEL STEEL					
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
STRAIGHT CHROMIUM STEEL					
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
††420	24.00	28.50	33.50	23.75	36.50
430	19.00	22.00	29.00	17.50	22.50
‡‡430F.	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
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 annealing and pickling.

Rivets, Washers

F.o.b. Pittsburgh, Cleveland, Chicago Birmingham

Structural 3.75c
$\frac{7}{16}$-inch and under .... 65-5 off
Wrought, Washers, Pittsburgh, Chicago, Philadelphia, to jobbers and large nut, bolt manufacturers l.c.l. .... $2.75 3.00 off

Bolts, Nuts

F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discounts for carloads additional 5%, full containers, add 10%

Carriage and Machine

½ x 6 and smaller	65½ off
Do., $\frac{7}{16}$ and ⅝ x 6-in. and shorter	63½ off
Do., ¾ to 1 x 6-in. and shorter	61 off
1⅛ and larger, all lengths	59 off
All diameters, over 6-in. long	59 off
Tire bolts	50 off
Step bolts	56 off
Plow bolts	65 off

Stove Bolts

In packages with nuts separate 71-10 off; with nuts attached 71 off; bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Nuts

Semifinished hex	U.S.S.	S.A.E.
$\frac{7}{16}$-inch and less	62	64
½-1-inch	59	60
1⅛-1½-inch	57	58
1⅝ and larger	56	..

Hexagon Cap Screws

Upset 1-in., smaller	64 off
Milled 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	71 off
Headless, ¼-in., larger	60 off
No. 10, smaller	70 off

Basing Point Prices are (1) those announced by U. S. Steel Corp. subsidiaries for first quarter of 1941 or in effect April 16, 1941 at designated basing points or (2) those prices announced or customarily quoted by other producers at the same designated points. Base prices under (2) cannot exceed those under (1) except to the extent prevailing in third quarter of 1940.

Extra mean additions or deductions from base prices in effect April 16, 1941.

Delivered prices applying to Detroit, Eastern Michigan, Gulf and Pacific Coast points are deemed basing points except in the case of the latter two areas when water transportation is not available, in which case nearest basing point price plus all-rail freight may be charged.

Domestic Ceiling prices are the aggregate of (1) governing basing point price, (2) extras and (3) transportation charges to the point of delivery as customarily computed. Governing basing point is basing point nearest the consumer providing the lowest delivered price.

Seconds, maximum prices: flat-rolled rejects 75% of prime prices, wasters 75%, wastewasters 65% except plates, which take waster prices: tin plate $2.80 per 100 lbs.; terne plate $2.25; semifinished 85% of primes; other grades limited to new material ceilings.

Export ceiling prices may be either the aggregate of (1) governing basing point or emergency basing point (2) export extras (3) export transportation charges provided they are the f.a.s. seaboard quotations of the U. S. Steel Export Co. on April 16, 1941.

Metallurgical Coke

Price Per Net Ton

Beehive Ovens	
Connellsville, furnace	*7.50
Connellsville, foundry	8.00- 8.50
New River, foundry	9.00- 9.25
Wise county, foundry	7.75- 8.25
Wise county, furnace	7.25- 7.75
By-Product Foundry	
Kearney, N. J., ovens	13.05
Chicago, outside delivered	13.00
Chicago, delivered	13.75
Terre Haute, delivered	13.50
Milwaukee, ovens	13.75
New England, delivered	14.65
St. Louis, delivered	†13.75
Birmingham, delivered	10.90
Indianapolis, delivered	13.50
Cincinnati, delivered	13.25
Cleveland, delivered	13.20
Buffalo, delivered	13.40
Detroit, delivered	13.75
Philadelphia, delivered	13.28

*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 Omaha	
Pure and 90% benzol	15.00c
Toluol, two degree	28.00c
Solvent naphtha	27.00c
Industrial xylol	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 jobbers	8.00c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia	$28.20

WAREHOUSE STEEL PRICES

Base delivered price, cents per pound, for delivery within switching limits, subject to established extras.

	Hot rolled bars	Structural shapes	Plates	Floor plates	Hot rolled sheets (10 gage base)	Hot rolled bands (12 gage and heavier)	Hot rolled hoops (14 gage and lighter)	Galvanized flat sheets (24 gage base)	Cold-rolled sheets (17 gage base)	Cold finished bars	Cold-rolled strip	NE hot bars 8600 series
Boston	4.044[1]	3.912[1]	3.912[1]	5.727[1]	3.774[1]	4.106[1]	5.106[1]	5.224[14]	4.744[14]	4.244[11]	4.715	6.012[21]
New York	3.853[1]	3.758[1]	3.768[1]	5.574[1]	3.590[1]	3.974[1]	3.974[1]	5.010[13]	4.618[14]	4.203[21]	4.774	....
Jersey City	3.853[1]	3.747[1]	3.768[1]	5.574[1]	3.590[1]	3.974[1]	3.974[1]	5.010[13]	4.613[14]	4.203[21]	4.774	....
Philadelphia	3.822[1]	3.666[1]	3.605[1]	5.272[1]	3.518[1]	3.922[1]	4.272[1]	5.018[15]	4.872[28]	4.172[21]	4.772	5.816[28]
Baltimore	3.802[1]	3.759[1]	3.594[1]	5.252[1]	3.394[1]	3.902[1]	4.252[1]	4.894[1]	4.852[28]	4.152[21]	.....	.....
Washington	3.941[1]	3.930[1]	3.796[1]	5.341[1]	3.596[1]	4.041[1]	4.391[1]	5.196[17]	4.841[30]	4.141[21]	.....	.....
Norfolk, Va.	4.065[1]	4.002[1]	3.971[1]	5.465[1]	3.771[1]	4.165[1]	4.515[1]	5.371[17]	4.965[34]	4.265[21]	.....	.....
Bethlehem, Pa.*	.....	3.45[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Claymont, Del*	.....	.....	3.45[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....
Coatesville, Pa.*	.....	.....	3.45[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....
Buffalo (city)	3.35[1]	3.40[1]	3.63[1]	5.26[1]	3.35[1]	3.819[1]	3.819[1]	4.75[18]	4.40[18]	3.85[21]	4.669	5.60[28]
Buffalo (country)	3.25[1]	3.30[1]	3.30[1]	4.90[1]	3.25[1]	3.81[1]	3.50[1]	4.65[18]	4.30[10]	3.75[21]	4.35	5.60[28]
Pittsburgh (city)	3.35[1]	3.40[1]	3.40[1]	5.00[1]	3.35[1]	3.60[1]	3.60[1]	4.75[12]	4.40[34]	3.85[21]	.....	.....
Pittsburgh (country)	3.25[1]	3.30[1]	3.30[1]	4.90[1]	3.25[1]	3.50[1]	3.50[1]	4.65[12]	4.30[34]	3.75[21]	.....	.....
Cleveland (city)	3.35[1]	3.588[1]	3.40[1]	5.188[1]	3.35[1]	3.60[1]	3.60[1]	4.877[12]	4.40[34]	3.85[21]	4.45[21]	5.60[28]
Cleveland (country)	3.25[1]	.....	3.30[1]	.....	3.25[1]	3.50[1]	3.50[1]	.....	4.30[34]	3.75[21]	4.35[21]	.....
Detroit	3.450[1]	3.661[1]	3.609[1]	5.281[1]	3.450[1]	3.700[1]	3.700[1]	5.000[12]	4.500[34]	3.900[21]	4.659	5.93[28]
Omaha (city, delivered)	4.115[1]	4.165[1]	4.165[1]	5.765[1]	3.865[1]	4.215[1]	4.215[1]	5.608[19]	5.443[34]	4.543[13]	.....	.....
Omaha (country, base)	4.015[1]	4.065[1]	4.065[1]	5.665[1]	3.765[1]	4.115[1]	4.115[1]	5.508[19]	.....	.....	.....	.....
Cincinnati	3.611[1]	3.691[1]	3.661[1]	5.291[1]	3.425[1]	3.675[1]	3.675[1]	4.825[12]	4.475[34]	4.111[21]	4.711	6.10
Youngstown, O.*	.....	.....	.....	.....	.....	.....	.....	4.40[12]	.....	.....	.....	.....
Middletown, O.*	.....	.....	.....	.....	3.25[1]	3.50[1]	3.50[1]	4.65[16]	.....	.....	.....	.....
Chicago (city)	3.50[1]	3.55[1]	3.55[1]	5.15[1]	3.25[1]	3.60[1]	3.60[1]	5.231[15]	4.20[34]	3.85[21]	4.65	5.75[28]
Milwaukee	3.637[1]	3.687[1]	3.687[1]	5.287[1]	3.387[1]	3.737[1]	3.737[1]	5.272[15]	4.337[34]	3.987[21]	4.787	5.987[28]
Indianapolis	3.58[1]	3.63[1]	3.63[1]	5.23[1]	3.518[1]	3.768[1]	3.768[1]	4.918[15]	4.568[34]	4.08[21]	4.78	6.08[28]
St. Paul	3.76[2]	3.81[2]	3.81[2]	5.41[2]	3.51[2]	3.86[2]	3.86[2]	5.257[15]	4.46[34]	4.461[21]	5.102	6.09[28]
St. Louis	3.647[1]	3.697[1]	3.697[1]	5.297[1]	3.397[1]	3.747[1]	3.747[12]	5.172[15]	4.347[34]	4.131[21]	4.931	6.131[28]
Memphis, Tenn.	4.015[5]	4.065[5]	4.065[5]	5.78[5]	3.965[5]	4.215[5]	4.215[5]	5.265[15]	4.78[34]	4.43[21]	.....	.....
Birmingham	3.50[1]	3.55[1]	3.55[1]	5.903[1]	3.45[1]	3.70[1]	3.70[1]	4.75[15]	4.852[34]	4.64	5.215	.....
New Orleans (city)	4.10[4]	3.90[4]	3.90[4]	5.85[4]	4.058[4]	4.20[4]	4.20[4]	5.25[26]	5.079[10]	4.70[21]	5.429	.....
Houston, Tex.	3.75[3]	4.25[3]	4.25[3]	5.50[3]	3.763[3]	4.313[3]	4.313[3]	5.313[26]	4.10[10]	3.75[32]	.....	.....
Los Angeles	4.40[4]	4.65[4]	4.95[4]	7.20[4]	5.00[4]	4.95[4]	6.75[4]	6.00[13]	7.20[6]	5.683[22]	5.613	5.85[28]
San Francisco	4.15[7]	4.35[7]	4.85[7]	6.35[7]	4.55[7]	4.50[7]	5.75[7]	6.35[15]	7.30[15]	5.433[21]	7.333	8.304[28]
Portland, Oreg.	4.45[27]	4.45[27]	4.75[27]	6.50[27]	4.65[27]	4.75[27]	6.30[27]	5.75[15]	6.60[15]	5.633[15]	.....	.....
Tacoma	4.35[6]	4.45[6]	4.75[6]	6.50[6]	4.65[6]	4.25[6]	5.45[6]	5.95[15]	7.60[15]	5.883[21]	.....	.....
Seattle	4.35[6]	4.45[6]	4.75[6]	6.50[6]	4.65[6]	4.25[6]	5.45[6]	5.95[15]	7.05[15]	5.883[21]	.....	.....

*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 o above cities computed in accordance with regulations.

BASE QUANTITIES

[1]400 to 1999 pounds; [2]—400 to 14,999 pounds; [3]—any quantity; [4]—300 to 1999 pounds; [5]—400 to 8999 pounds; [6]—300 to 9999 pounds; [7]—400 to 39,999 pounds; [8]—under 2000 pounds; [9]—under 4000 pounds; [10]—500 to 1499 pounds; [11]—one bundle to 39,999 pounds; [12]—150 to 2249 pounds; [13]—150 to 1499 pounds; [14]—three to 24 bundles; [15]—450 to 1499 pounds; [16]—one bundle to 1499 pounds; [17]—one to nine bu [18]—one to six bundles; [19]—100 to 749 pounds; [20]—300 to 1999 p [21]—1500 to 39,999 pounds; [22]—1500 to 1999 pounds; [23]—10 39,999 pounds; [24]—400 to 1499 pounds; [25]—1000 to 1999 p [26]—under 25 bundles. Cold-rolled strip, 2000 to 39,999 pounds, [27]— 300 to 4999 pounds.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (Natural)
Lower Lake Ports

Old range bessemer	$4.75
Mesabi nonbessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer	4.60

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56-63% contract	13.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Manganiferous ore, 45-55% Fe., 6-10% Mang.	Nom.
N. African low phos.	Nom.
Spanish, No. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% f.o.b. Rio de Janeiro	7.50-8.00

Tungsten Ore

Chinese Wolframite, per short ton unit, duty paid	$24.00

Chrome Ore

(Equivalent OPA schedules):

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Ore., or Tacoma, Wash.
(S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$41.00
48% 3:1	43.50
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$27.40
45% no ratio	28.30
48% no ratio	31.00
50% no ratio	32.80
Brazilian—nominal	
44% 2.5:1 lump	33.65
48% 3:1 lump	43.50
Rhodesian	
45% no ratio	28.30
48% no ratio	31.00
48% 3:1 lump	43.50
Domestic (seller's nearest rail)	
48% 3:1	52.80
less $7 freight allowance	

Manganese Ore

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 Pueblo, 91.0c; prices include duty o ported ore and are subject t miums, penalties and other sions of amended M.P.R. No. effective as of May 15. Pr basing points which are also of discharge of imported m nese ore is f.o.b. cars, ships dock most favorable to the

Molybdenum

Sulphide conc., lb., Mo. cont., mines	

NATIONAL EMERGENCY STEELS (Hot Rolled)

(Extras for alloy content)

Basic open-hearth Electric f

Designation	Chemical Composition Limits, Per Cent — Carbon	Mn.	Si.	Cr.	Ni.	Mo.	Bars per 100 lb.	Billets per GT	Bars per 100 lb.
NE 8612	.10-.15	.70-.90	.20-.35	.40-.60	.40-.70	.15-.25	$0.65	$13.00	$1.15
NE 8720	.18-.23	.70-.90	.20-.35	.40-.60	.40-.70	.20-.30	.70	14.00	1.20
NE 9415	.13-.18	.80-1.10	.20-.35	.30-.50	.30-.60	.08-.15	.75	15.00	1.25
NE 9425	.23-.28	.80-1.20	.20-.35	.30-.50	.30-.60	.08-.15	.75	15.00	1.30
NE 9442	.40-.45	1.00-1.30	.20-.35	.30-.50	.30-.60	.08-.15	.80	16.00	1.15
NE 9722	.20-.25	.50-.80	.20-.35	.10-.25	.40-.70	.15-.25	.65	13.00	1.80
NE 9880	.28-.33	.70-.90	.20-.35	.70-.90	.85-1.15	.20-.30	1.30	26.00	1.55
NE 9912	.10-.15	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.20	24.00	1.55
NE 9920	.18-.23	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.20	24.00	

Extras are in addition to a base price of 2.70c. per pound on finished products and semifinished steel major basing points and are in cents per pound and dollars per gross ton. on vanadium alloy.

$54 per gross to No prices q

Pig Iron

Prices (in gross tons) are maximums fixed by OPA Price Schedule No. 1, effective June 10, 1941, amended Feb. 14, and Oct. 22, 1945. Exceptions indicated in footnotes. Base prices bold face, delivered light face. Federal tax on freight charges, effective Dec. 1, 1942, not included.

	Foundry	Basic	Bessemer	Malleable
Buffalo, Pa., base	$26.75	$26.25	$27.75	$27.25
Newark, N. J., del.	28.28	27.78	29.28	28.78
Jersey City, N. Y., del.	29.25	.....	.....	29.75
Philadelphia, Pa., base	26.75	26.25	27.75	27.25
Birmingham, base	†22.13	†20.75	26.75	.....
Baltimore, del.	27.36	.....	.....	.....
Boston, del.	26.89	.....	.....	.....
Chicago, del.	25.97	.....	.....	.....
Cincinnati, del.	25.81	24.48	.....	.....
Cleveland, del.	25.87	24.99	.....	.....
New York, N. J.	27.90	.....	.....	.....
Philadelphia, del.	27.21	26.71	.....	.....
St. Louis, del.	25.87	24.99	.....	.....
Toledo, base	25.75	24.75	26.75	26.25
Boston, del.	27.25	26.75	28.25	27.75
Worcester, del.	27.28	.....	28.28	27.78
Syracuse, del.	27.83	.....	28.83	28.33
Duluth, base	25.75	25.25	26.25	25.75
Milwaukee, del.	26.85	26.35	27.35	26.85
Muskegon, Mich., del.	28.94	.....	.....	28.94
Portland, base	25.75	25.25	26.25	25.75
Buffalo, Canton, O., del.	27.14	26.64	27.64	27.14
Cleveland, base	25.75	25.25	26.25	25.75
Saginaw, Mich., del.	28.06	27.56	28.56	28.06
Toledo, base	26.25	25.75	26.75	26.25
St. Paul, del.	28.38	27.88	28.88	28.38
Troy, Pa., base	25.75	25.25	26.75	26.25
Everett, Mass., base	26.75	26.25	27.75	27.25
Boston, del.	27.25	26.75	28.25	27.75
Kansas City, Ill., base	25.75	25.25	26.25	25.75
St. Louis, del.	26.25	25.75	.....	26.25
Canton, O., base	25.75	25.25	.....	25.75
Cincinnati, del.	26.19	26.36	.....	26.86
Rock Island, Pa., base	25.75	25.25	26.25	25.75
Pittsburgh, del.				
No. & So. sides	26.44	25.94	26.94	26.44
Provo, Utah, base	23.75	23.25	.....	.....
Sharpsville, Pa., base	25.75	25.25	26.25	25.75
Sparrows Point, base	26.75	26.25	.....	.....
Baltimore, del.	27.74	.....	.....	.....
Easton, Pa., base	.....	26.25	.....	27.25
Everett, Pa., base	26.75	26.25	27.75	27.25
Philadelphia, del.	27.59	27.09	.....	28.09
Youngstown, O., base	25.75	25.25	26.25	25.75
Youngstown, O., base	25.75	25.25	26.25	25.75
Mansfield, O., del.	27.69	27.19	28.19	27.69

Basic 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 Bessemer iron. †For phosphorus 0.70% or over deduct 38 cents. §For Rock Rocks, Pa., add .55 to Neville Island base; Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Aliquippa, .84; Monessen, Monongahela City .97 (water); Oakmont, Verona 1.11; Brackenbridge 1.24.

Silicon differentials: Add 50 cents per ton for each 0.50% manganese or portion thereof over 1.00%.

Phosphorus differentials: Under 0.50%, no extra; 0.50% to 0.74% incl., $2 per ton; for each additional 0.25% nickel, $1 per ton.

High Silicon, Silvery

6.00-6.50 per cent (base)	$31.25		
6.51-7.00	$32.25	9.01- 9.50	37.25
7.01-7.50	33.25	9.51-10.00	38.25
7.51-8.00	34.25	10.01-10.50	39.25
8.01-8.50	35.25	10.51-11.00	40.25
8.51-9.00	36.25	11.01-11.50	41.25

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 Ferrosilicon: Sil. 14.01 to 14.50%, $45.50; each additional .50% silicon up to and including 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 silvery iron, plus $1 per gross ton.

Charcoal Pig Iron

Northern

Lake Superior Furn. $34.00
Chicago, del. 37.34

Southern

Semi-cold blast, low phos., f.o.b. furnace, Lyles, Tenn. $33.00 (For higher silicon irons a differential 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. $25.25
Valley base 25.25

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Buffalo, N. Y., $31.25 base; $32.49, del. Philadelphia. Intermediate phos., Central Furnace, Cleveland, $28.25.

Switching Charges: Basing point prices are subject to an additional charge for delivery within the switching limits of the respective 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 reduction of 38 cents a ton for phosphorus content of 0.70% and over.

Ceiling Prices are the aggregate of (1) governing basing point (2) differentials (3) transportation charges 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 Ceiling Prices: Struthers Iron & Steel Co. may charge 50 cents a ton in excess of basing point prices for No. 2 Foundry, 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 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
Ohio	47.70

Second Quality

Pa., Ill., Md., Mo., Ky.	49.35
Alabama, Georgia	40.80
New Jersey	52.00
Ohio	33.15

Malleable Bung Brick

All bases 63.45

Silica Brick

Pennsylvania	54.40
Joliet, E. Chicago	62.45
Birmingham, Ala.	54.40

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry Press	32.90
Wire Cut	30.80

Magnesite

Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk 22.00
net ton, bags 26.00

Basic Brick

net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	54.00
Chem. bonded chrome	54.00
Magnesite brick	76.00
Chem. bonded Magnesite	65.00

Fluorspar

Metallurgical grade, f.o.b. Ill., Ky., net tons, carloads, CaF_2 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.

Ferroalloy Prices

Manganese (standard) 78-82% gross ton, duty paid, $135 f.o.b. Baltimore, Philadelphia or New York, whichever is most favorable to buyer; Rockdale or Rockwood, Tenn., where Tennessee Products Corp. is producer; Birmingham, Ala., where Sloss-Sheffield Steel & Iron Co. is producer; $140 f.o.b. cars, Pittsburgh, where Carnegie-Illinois Steel Corp. is producer; add $6 for carload, $10 per ton, $13.50 for less-than-carload, $1.70 for each 1%, or fraction thereof, contained manganese over 82% and under 78%.

Manganese (Low and Medium Grades) per lb. contained manganese: eastern zone, low carbon, bulk, c.l., 23c; 2000 lb. to c.l., 24.50c; medium, 14.50c and 15.20c; low carbon, bulk, c.l., 2000 lb to c.l., 24.40c; 14.80c and 16.20c; western: low carbon, bulk, c.l., 24.50c, 2000 lb. to c.l., 25.40c; medium, 15.20c and 17.20c; f.o.b. shipping point, freight allowed.

Molybdenum: 19-21% carlots per lb. contained Mo, Palmerton, Pa., $36; Langeloth, $40.50; Chicago, $40.60.

Metallic Manganese: 99.9% plus, carlots, per lb. 37.6 cents.

Chromium Metal: 97% min. chromium, 2% max. 50% carbon, eastern zone, per lb. contained chromium in carlots, c.l., 79.50c, 2000 lb. to c.l., central 81c and 82.50c; western 82.5c and 84.75c; f.o.b. shipping point, freight allowed.

Ferrocolumbium: 50-60%, per lb. contained columbium in gross ton lots, contract basis, F. R. freight allowed eastern zone, $2.25; less-ton lots $2.30. Spot prices 10 cents per lb. higher.

Ferrochrome: High carbon, eastern zone, bulk, c.l., 13c, 2000 lb. to c.l. 13.90c; central, add .40c and .65c; western, add 1c and 1.85c—high nitrogen, high carbon ferrochrome; Add 5c to all high carbon ferrochrome prices; all zones; low carbon eastern, bulk, c.l. max. 0.06% carbon, 23c, 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% 21.50c, 2.00% 20.50c; 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. shipping point, freight allowed. Prices per lb. contained Cr high nitrogen, low carbon ferrochrome: Add 2c to low carbon ferrochrome prices; all zones. For higher nitrogen carbon add 2c for each .25% of nitrogen 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%, sil. 4-6%, mang. 4-6% and carbon 1.25% max.) Contract, carlot, bulk, 20.00c, packed 20.45c, ton lots 21.00c, less ton lots 22.00c, eastern, freight allowed, per pound contained chromium, 20.40c, 20.85c, 21.65c and 22.65c, central; 21.00c, 21.45c, 22.85c and 23.85c, western; spot up .25c.

SMZ Alloy: (Silicon 60-65%, Mang. 5-7%, zir. 5-7% and iron approx. 20%) per lb. of alloy contract carlots 11.50c, ton lots 12.00c, less 12.50c, eastern zone, freight allowed; 12.00c, 12.85c and 13.35c central zone; 14.05c, 14.60c and 15.10c, western; spot up .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 lb. of alloy contract, carlots 25.00c, ton lots 26.00c, less ton lots 27.00c, eastern, freight allowed, 25.50c, 26.75c and 27.75c, central; 27.50c, 28.90c and 29.90c, western; spot up .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 lb. of alloy. Contract, carlots 58.00c, ton lots 59.00c, less 60.00c, eastern, freight allowed; 58.50c, 59.75c and 60.75c, central; 60.50c, 61.90c and 62.90c, western; spot up ¼c.

CMSZ Alloy 4: (Chr. 45-49%, mang. 4-6%, sil. 18-21%, zir. 1.25-1.75%, and car. 3.00-4.50%). Contract, carlots, bulk, 11.00c and packed 11.50c; ton lots 12.00c; less 12.50c, eastern, freight allowed; 11.50c and 12.00c, 12.75c, 13.25c, central; 13.50c and 14.00c, 14.75c, 15.25c, western; spot up .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, 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., sil. 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 allowed; $1.2075 and $1.3075 central; $1.229 and $1.329, western; spot add 5c.

Manganese-Boron: (Mang. 75% approx., boron 15-20%, iron 5% max. sil. 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 lb. of alloy. Contract, 5 tons or more, $1.90, 1 ton to 5 tons, $2.00, less than ton $2.10, eastern, freight allowed; $1.9125, $2.0125 and $2.1125, central; $1.9445, $2.0445 and $2.1445, western; spot same as contract.

Chromium-Copper: (Chrom. 8-11%, cu. 88-90%, iron 1% max. sil. 0.50% max.) contract, any quantity, 45c, eastern, Niagara Falls, N. Y., basis, freight allowed to destination, except to points taking rate in excess of St. Louis rate to which equivalent of St. Louis rate will be allowed; spot up 2c.

Vanadium Oxide: (Fused: Vanadium oxide 85-88%, sodium oxide approx. 10% and calcium oxide, approx. 2%, or Red Cake; Vanadium oxide 85% approx., sodium oxide, approx. 9% and water approx.

2.5%) Contract, any quantity, $1.10 eastern, freight allowed per pound vanadium oxide contained; contract carlots, $1.105, less carlots, $1.108, central; $1.118 and $1.133, western; spot add 5c to contracts in all cases.

Calcium metal; cast: Contract ton lots or more $1.80, less, $2.30, eastern zone, freight allowed, per pound of metal; $1.809 and $2.309 central, $1.849 and $2.349, western; spot up 5c.

Calcium-Manganese-Silicon: (Cal. 16-20% mang. 14-18% and sil. 59-59%), 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.

Calcium-Silicon: (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, eastern, freight allowed; 13.50c, 15.25c and 16.25c central; 15.55c, 17.40c and 18.40c, western; spot up .25c.

Briquets, Ferromanganese: (Weight approx. 3 lbs. and containing exactly 2 lbs. mang.) per lb. of briquets. Contract, carlots, bulk .0605c, packed .063c, tons .0655c, less .068c eastern freight allowed; .063c, .0655c, .0755c and .078c, central; .066c, .0685c, .0855c, and .088c, 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,** eastern, containing exactly 2 lb. manganese and approx. ⅛ lb. silicon, bulk, c.l., 5.80c, 2000 lbs. to c.l., 6.30c; central, add .25c for c.l. and 1c for 2000 lb. to c.l.; western, add .5c for c.l., and 2c for 2000 lb. to c.l.; **ferrosilicon,** eastern, approx. 5 lb., containing exactly 2 lb. silicon, or weighing approx. 2½ lb. and containing exactly 1 lb. of silicon, bulk, c.l., 3.35c, 2000 lb. to c.l., 3.80c; central, add 1.50c for c.l., and .40c for 2000 lb. to c.l.; western, add 3.0c for c.l. and .45c for 2000 to c.l.; f.o.b. shipping point, freight allowed.

Ferromolybdenum: 55-75% per lb. contained molybdenum f.o.b. Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Ferrophosphorus: 17-19%, based on 18% phosphorus content, with unitage of $3 for each 1% of phosphorus above or below the base; gross tons per carload f.o.b. sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferrosilicon: Eastern zone, 90-95%, bulk, c.l., 11.05c, 2000 lb. to c.l., 12.30c; 80-90%, bulk c.l., 8.90c, 2000 lb. to c.l., 9.95c; 75%, bulk, c.l., 8.05c, 2000 lb. to c.l., 9.05c; 50%, bulk c.l., 6.65c and 2000 lb. to c.l., 7.85c; central 90-95%, bulk, c.l., 11.20c, 2000 lb. to c.l., 12.80c; 80-90%, bulk, c.l., 9.05c, 2000 to c.l., 10.45c; 75%, bulk, c.l., 8.20c, 2000 lb. to c.l., 9.65c; 50% bulk, c.l., 7.10c, 2000 lb. to c.l., 9.70c; western, 90-95%, bulk, c.l., 11.65c, 2000 lb. to c.l., 15.60c; 80-90%, bulk, c.l., 9.55c, 2000 lb. to c.l., 13.50c; 75%, bulk, c.l., 8.75c, 2000 to c.l., 13.10c; 50%, bulk, c.l., 7.25c, 2000 to c.l., 8.75c; f.o.b. shipping 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, 13.85c and 16.80c; min. 96% silicon and max. 2% iron, eastern, bulk, c.l., 12.50c, 2000 lb. to c.l., 13.10c; central, 12.80c and 13.55c; western, 13.45c and 16.50c f.o.b. shipping point, freight allowed. Price per lb. contained silicon.

Manganese Metal: (96% min. manganese, max. 2% iron), per lb. of metal, eastern zone, bulk, c.l., 30c, 2000 lb. to c.l., 32c, central, 30.25c, and 33c; western 30.55c and 35.05c.

Ferrotungsten: Spot, carlots, per lb. contained tungsten, $1.90; freight allowed as far west as St. Louis.

Tungsten Metal Powder. Spot, not less than 97 per cent, $2.50-$2.60; freight allowed as far west as St. Louis.

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 maximum carbon; per lb. contained titanium; ton lots $1.35; less-ton lots $1.40 eastern. Spot 5 cents per lb. higher.

High-Carbon Ferrotitanium: 15-20% contract basis, per gross ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi River and North of Balti and St. Louis, 6.8% carbon $14 3-5% carbon $157.50.

Carbortam: Boron 0.90 to 1 net ton to carload, 8c lb. Suspension Bridge, N. Y., fr lowed same as high-carbon titanium.

Bortam: Boron 1.5-1.9%, ton 45c lb., less ton lots 50c lb.

Ferrovanadium: 35-55%, co basis, per lb. contained vana f.o.b. producers plant with freight allowances; open-h grade $2.70; special grade highly-special grade $2.90.

Zirconium Alloys: 12-15%, p of alloy, eastern contract, c bulk, 4.60c, packed 4.80c, to 4.80c, less tons 5c, carloads, per gross ton $102.50; p $107.50; ton lots $108; less-to $112.50. Spot ¼c per ton high

Zirconium Alloy: 35-40%, Ea contract basis, carloads in bu package, per lb. of alloy 1 gross ton lots 15.00c; less-to 16.00c. Spot ¼ cent higher.

Alsifer: (Approx. 20% alum 40% silicon, 40% iron) contra sis f.o.b. Niagara Falls, N. Y lb. 5.75c; ton lots 6.50c. Sp cent higher.

Siminal: (Approx. 20% eac Mn., Al.) Contract, frt. all. no St. Louis rate, per lb. alloy; lots 8c; ton lots 8.75c; less to 9.25c.

Borosil: 3 to 4% boron, 40 to Si., $6.25 lb. cont. Bo., f.o.b. O., freight not exceeding St. rate allowed.

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 pa of Sept. 4, 1944, issue of STEEL. Quotations are on gross tons.

PHILADELPHIA:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$18.75
No. 2 Heavy Melt. Steel	18.75
No. 2 Bundles	18.75
No. 3 Bundles	16.75
Mixed Borings, Turnings	13.75
Machine Shop Turnings	13.75
Billet, Forge Crops	23.75
Bar Crops, Plate Scrap	21.25
Cast Steel	21.25
Punchings	21.25
Elec. Furnace Bundles	19.75
Heavy Turnings	18.25

Cast Grades

(F.o.b. Shipping Point)

Heavy Breakable Cast	16.50
Charging Box Cast	19.00
Cupola Cast	20.00
Unstripped Motor Blocks	17.50
Malleable	22.00
Chemical Borings	16.51

NEW YORK:

(Dealers' buying prices.)

No. 1 Heavy Melt. Steel	$15.33
No. 2 Heavy Melt. Steel	15.33
No. 2 Hyd. Bundles	15.33
No. 3 Hyd. Bundles	13.33
Chemical Borings	14.33
Machine Turnings	10.33
Mixed Borings, Turnings	10.33
No. 1 Cupola	20.00
Charging Box	19.00
Heavy Breakable	16.50
Unstrip Motor Blocks	17.50
Stove Plate	19.00

CLEVELAND:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$19.50
No. 2 Heavy Melt. Steel	19.50
No. 1 Comp. Bundles	19.50
No. 2 Comp. Bundles	19.50
No. 1 Busheling	19.50
Mach. Shop Turnings	14.50
Short Shovel Turnings	16.50
Mixed Borings, Turnings	14.50
No. 1 Cupola Cast	20.00
Heavy Breakable Cast	16.50
Cast Iron Borings	13.50-14.00
Billet, Bloom Crops	24.50
Sheet Bar Crops	22.00
Plate Scrap, Punchings	22.00
Elec Furnace Bundles	20.50

BOSTON:

(F.o.b. shipping points)

No. 1 Heavy Melt. Steel	$14.06
No. 2 Heavy Melt. Steel	14.06
No. 1 Bundles	14.06
No. 2 Bundles	14.06
No. 1 Busheling	14.06
Machine Shop Turnings	9.06
Mixed Borings, Turnings	9.06
Short Shovel Turnings	11.06
Chemical Borings	13.81
Low Phos. Clippings	16.56
No. 1 Cast	20.00
Clean Auto Cast	20.00
Stove Plate	19.00
Heavy Breakable Cast	16.50

Boston Differential 99 cents higher, steel-making grades; Providence $1.09 higher.

PITTSBURGH:

(Delivered consumer's plant)

Railroad Heavy Melting	$21.00
No. 1 Heavy Melt. Steel	20.00
No. 2 Heavy Melt. Steel	20.00
No. 1 Comp. Bundles	20.00
No. 2 Comp. Bundles	20.00
Short Shovel Turnings	17.00
Mach Shop Turnings	15.00
Mixed Borings, Turnings	15.00
No. 1 Cupola Cast	20.00
Heavy Breakable Cast	16.50
Cast Iron Borings	16.00
Billet, Bloom Crops	25.00
Sheet Bar Crops	22.50
Plate Scrap, Punchings	22.50
Railroad Specialties	24.50
Scrap Rail	21.50
Axles	26.00
Rail 3 ft. and under	23.50
Railroad Malleable	22.00

VALLEY:

(Delivered consumer's plant)

No. 1 R.R. Hvy Melt.	$21.00
No. 1 Heavy Melt. Steel	20.00
No. 1 Comp. Bundles	20.00
Short Shovel Turnings	17.00
Cast Iron Borings	16.00
Machine Shop Turnings	15.00
Low Phos. Plate	22.50

MANSFIELD, O.:

(Delivered consumer's plant)

Machine Shop Turnings	15.00

BIRMINGHAM:

(Delivered consumer's plant)

Billet Forge Crops	$22.00
Structural, Plate Scrap	19.00
Scrap Rails Random	18.50
Rerolling Rails	20.50
Angle Splice Bars	20.50
Solid Steel Axles	24.00
Cupola Cast	20.00
Stove Plate	19.00
Long Turnings	8.50- 9.00
Cast Iron Borings	8.50- 9.00
Iron Car Wheels	16.50-17.00

CHICAGO:

(Delivered consumer's plant)

No. 1 R.R. Hvy Melt.	$19.75
No. 1 Heavy Melt. Steel	18.75
No. 2 Heavy Melt. Steel	18.75
No. 1 Ind. Bundles	18.75
No. 2 Dlr. Bundles	18.75
Baled Mach. Shop Turn	18.75
No. 3 Galv. Bundles	16.75
Machine Turnings	13.75
Mix. Borings, Sht. Turn	13.75
Short Shovel Turnings	15.75
Cast Iron Borings	14.75
Scrap Rails	20.25
Cut Rails, 3 feet	22.25
Cut Rails, 18-inch	23.50
Angles, Splice Bars	22.25
Plate Scrap, Punchings	21.25
Railroad Specialties	22.75
No. 1 Cast	20.00
R.R. Malleable	22.00

(Cast grades f.o.b. shipping point, railroad grades f.o.b. tracks)

BUFFALO:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$19.25
No. 2 Heavy Melt. Steel	19.25
No. 1 Bundles	19.25
No. 2 Bundles	19.25
No. 1 Busheling	19.25
Machine Turnings	14.25
Short Shovel Turnings	16.25
Mixed Borings, Turn.	14.25
Cast Iron Borings	15.25
Low Phos.	21.75

DETROIT:

(Dealers' buying prices.)

Heavy Melting Steel	$17.32
No. 1 Busheling	17.32
Hydraulic Bundles	17.32
Flashings	17.32
Machine Turnings	12.32
Short Shovel, Turnings	14.32
Cast Iron Borings	13.32
Low Phos. Plate	19.82
No. 1 Cast	20.00
Heavy Breakable Cast	16.50

ST. LOUIS

(Delivered consumer's plant)

Heavy Melting	17.50
No. 1 Locomotive Tires	20.00
Misc. Rails	19.00
Railroad Springs	22.00
Bundled Sheets	17.50
Axle Turnings	17.00
Machine Turnings	
Shoveling Turnings	
Rerolling Rails	
Steel Car Axles	21.5
Steel Rails, 3 ft.	
Steel Angle Bars	
Cast Iron Wheels	
No. 1 Machinery Cast	
Railroad Malleable	
Breakable Cast	
Stove Plate	
Grate Bars	
Brake Shoes	
(Cast grades f.o.b. shipping	
Stove Plate	

CINCINNATI:

(Delivered consumer's plan

No. 1 Heavy Melt. Steel	
No. 2 Heavy Melt. Steel	
No. 1 Comp. Bundles	
No. 2 Comp. Bundles	
Machine Turnings	9.50
Shoveling Turnings	11.50
Cast Iron Borings	11.00
Mixed Borings, Turnings	10.50
No. 1 Cupola Cast	
Breakable Cast	21.00
Low Phosphorus	20.50
Scrap Rails	16.00
Stove Plate	

LOS ANGELES:

(Delivered consumer's plan

No. 1 Heavy Melt. Steel	
No. 2 Heavy Melt. Steel	
No. 1, 2, Deal. Bundles	
Machine Turnings	
Mixed Borings, Turnings	
No. 1 Cast	

SAN FRANCISCO:

(Delivered consumer's plan

No. 1 Heavy Melt. Steel	
No. 2 Heavy Melt. Steel	
No. 1 Busheling	
No. 1, No. 2 Bundles	
No. 3 Bundles	
Machine Turnings	
Billet, Forge Crops	
Bar Crops, Plate	
Cast Steel	
Cut, Structural, Plate, 1", under	
Alloy-free Turnings	
Tin Can Bundles	
No. 2 Steel Wheels	
Iron, Steel Axles	
No. 2 Cast Steel	
Uncut Frogs, Switches	
Scrap Rails	
Locomotive Tires	

...er: Electrolytic or Lake from producers in ...s 12.00c, Del. Conn., less carlots 12.12½c, ...ery; dealers may add ¾c for 5000 lbs. to ... 1000-4999 lbs. 1c; 500-999 1½c; 0-499 ...tings, 11.75c, refinery for 20,000 lbs., or ... 12.00c less than 20,000 lbs.

...Ingot: Carlot prices, including 25 cents ...ndred freight allowance; add ¼c for ...an 20 tons; 85-5-5-5 (No. 115) 13.00c; ... (No. 215) 16.50c; 80-10-10 (No. 305) ... Navy G (No. 225) 16.75c; Navy M ...(245) 14.75c; No. 1 yellow (No. 405) ...; manganese bronze (No. 420) 12.75c.

...: Prime western 8.25c, select 8.35c, brass ... 8.50c, intermediate 8.75c, E. St. Louis. ...lots. For 20,000 lbs. to carlots add ... 10,000-20,000 0.25c; 2000-10,000 0.40c; ... 2000 0.50c.

...: Common 6.35c, chemical, 6.40c, corrod-... 6.45c, E. St. Louis for carloads; add 5 ... for Chicago, Minneapolis-St. Paul, Mil-...-Kenosha districts; add 15 points for ...land-Akron-Detroit area, New Jersey ... York state, Texas, Pacific Coast, Rich-... Indianapolis-Kokomo; add 20 points for ...ingham, Connecticut, Boston-Worcester, ...field, New Hampshire, Rhode Lsland.

...ry Aluminum: 99% plus, ingots 15.00c ...s 14.00c del.; metallurgical 94% min. ... del. Base 10,000 lbs. and over; add ½c ...999 lbs.; 1c less through 2000 lbs.

...ary Aluminum: All grades 12.50c per lb. ...s follows: Low grade piston alloy (No. ...) 10.50c; No. 12 foundry alloy (No. ...) 10.50c; chemical warfare service ...(92½% plus) 10.00c; steel deoxidizers ... bars, granulated or shot, Grade 1 ...%) 11.00c, Grade 2 (92-95%) 9.50c to ... Grade 3 (90-92%) 8.50c to 8.75c, Grade ...%) 7.50c to 8.00c; any other ingot ... over 1% iron, except PM 754 and ..., 12.00c. Above prices for 30,000 lb. ...: add ¼c 10,000-30,000 lb.; ¼c 1000-... lbs.; 1c less than 1000 lbs. Prices in-... at carload rate up to 75 cents ...

...: Commercially pure (99.8%) stand-... (4-notch, 17 lbs.) 20.50c lb., add ... special shapes and sizes. Alloy ingots, ... bomb alloy, 23.40c; 50-50 mag-...aluminum, 23.75c; ASTM B93-41T, ... 3, 4, 12, 13, 14, 17, 23.00c; Nos. 4X, ... 17X, 25.00c; ASTM B-107-41T, or ...T, No. 8X, 23.00c; No. 18, 23.50c; No. ... 25.00c. Selected magnesium crystals, ... and muffs, including all packing ..., barrelling, handling, and other ... charges, 23.50c. Price for 100 ... more; for 25-100 lbs., add 10c; for ... 25 lbs., 20c. Incendiary bomb alloy, ... plant, any quantity; carload freight al-... all other alloys for 500 lbs. or more.

...: Prices ex-dock, New York in 5-ton lots, ... cent for 2240-11,199 lbs., 1½c 1000-2239. ... 50-999, 3c under 500. Grade A, 99.8% ...er (includes Straits), 52.00c; Grade B, ... or higher, not meeting specifications ... Grade A, with 0.05 per cent maximum ..., 51.87½c; Grade C, 99.65-99.79% incl. ...: Grade D, 99.50-99.64% incl., 51.50c; ... E, 99-99.49% incl. 51.12½c; Grade F, ... 99% (for tin content), 51.00c.

...: American bulk carlots f.o.b. La-... Tex., 99.0% to 99.8% and 99.8% and ... not meeting specifications below, ...: 99.8% and over (arsenic, 0.05%, max. ... impurities, 0.1%, max.) 15.00c. On ... sales add ¼c for less than carload ... lb.; ½c for 9999-224 lb.; and 2c for ... and less; on sales by dealers, distribu-... and jobbers add ½c, 1c, and 3c, respec-...

...: Electrolytic cathodes, 99.5%, f.o.b. ... 35.00c lb.; pig and shot produced from ...lytic cathodes 36.00c; "F" nickel shot ... for additions to cast iron, 34.00c; ... shot 28.00c.

...: Open market, spot, New York, $93-... 76-lb. flask.

...: Prime, white, 99%, carlots, 4.00c lb.

...m-Copper: 3.75-4.25% Be., $17 lb. con-... Be.

...: Bars, ingots, pencils, pigs, plates, ..., slabs, sticks, and all other "regular" ... 34.00c f.o.b. Niagara Falls.

straight or flat forms 90.00c lb., del.; anodes, balls, discs and all other special or patented shapes 95.00c lb. del.

Cobalt: 97-99%, $1.50 lb. for 550 lb. (bbl.); $1.52 lb. for 100 lb. (case); $1.57 lb. under 100 lb.

Indium: 99.9%, $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.

Seamless 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 15.37½c, less-carlots 15.87½c; weatherproof, f.o.b. Eastern mills, carlot 17.00c, less-carlots 17.50c; magnet, delivered, 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"	31.70c	37.20c
23-24	3"-24"	25.60c	29.20c

Lead Products: Prices to jobbers; full sheets 9.50c; cut sheets 9.75c; pipe 8.15c, New York; 8.25c, Philadelphia, Baltimore, Rochester and Buffalo; 8.75c, Chicago, Cleveland, Worcester, Boston.

Zinc Products: Sheet f.o.b. mill, 13.15c; 36,000 lbs. and over deduct 7%; Ribbon and strip 12.25c, 3000-lb. lots deduct 1%, 6000 lbs. 2%, 9000 lbs. 3%, 18,000 lbs. 4%, carloads and over 7%. Boiler plate (not over 12") 3 tons and over 11.00c; 1-3 tons 12.00c; 500-2000 lbs. 12.50c; 100-500 lbs. 13.00c; under 100 lbs. 14.00c. Hull plate (over 12") add 1c to boiler plate prices.

Plating Materials

Chromic Acid: 99.75%, flake, del., carloads 16.25c; 5 tons and over 16.75c; 1-5 tons 17.25c; 400 lbs. to 1 ton 17.75c; under 400 lbs. 18.25c.

Copper Anodes: Base 2000-5000 lbs., del.; oval 17.62c; untrimmed 18.12c; electro-deposited 17.37c.

Copper Carbonate: 52-54% metallic cu, 250 lb. barrels 20.50c.

Copper Cyanide: 70-71% cu, 100-lb. kegs or

Sodium Cyanide: 96%, 200-lb. drums 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 59.50c; 100-199 61.00c.

Tin Crystals: 400 lb. bbls. 39.00c f.o.b. Grasselli, N. J.; 100-lb. kegs 39.50c.

Sodium Stannate: 100 or 300-lb. drums 36.50c, del.; ton lots 33.50c.

Zinc Cyanide: 100-lb. kegs or bbls. 33.00c f.o.b. Niagara Falls.

Brass Mill Allowances: Prices for less than 15,000 lbs. f.o.b. shipping point. Add ⅝c for 15,000-40,000 lbs.; 1c for 40,000 or more.

Scrap Metals

	Clean Heavy	Rod Ends	Clean Turnings
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			
90%	9.375	9.125	8.625
95%	9.500	9.250	8.750
Red Brass, 85%	9.125	8.875	8.375
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 equivalent	10.250	10.000	9.250
Naval brass	8.250	8.000	7.500
Mang. bronze	8.250	8.000	7.500

Other than Brass Mill Scrap: Prices apply on material not meeting brass mill specifications and are f.o.b. shipping point; add ¾c for shipment of 60,000 lbs. of one group and ½c 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, aluminum bronze 9.00c; copper-nickel and borings 9.25c; car boxes, cocks and faucets 7.75c; bell metal 15.50c; babbit-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, wrought alloys, 2, 2.50c lb. Other high-grade alloys 3.50, 4.00c lb. Mixed plant scrap, all solids, 2, 2.50c 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.

Zinc Scrap: New clippings 7.25c, old zinc 5.25c f.o.b. point of shipment; add ½-cent for 10,000 lbs. or more. New die-cast scrap, radiator grilles 4.95c, add ½c 20,000 or more. Unsweated zinc dross; die cast slab 5.80c any quantity.

Nickel, Monel Scrap: Prices f.o.b. point of shipment; add ½c for 2000 lbs. or more of nickel or cupro-nickel shipped at one time and 20,000 lbs. or more of Monel. Converters (dealers) allowed 2c premium.

Nickel: 98% or more nickel and not over ½% 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 8.00c per lb. contained copper; less than 90% combined nickel and copper 26.00c for contained nickel only.

Monel: No. 1 castings, turnings 15.00c; new clipping 20.00c; soldered sheet 18.00c.

Sheets, Strip . . .

Sheet & Strip Prices, Page 200

Sheet demand has loaded mills with so much tonnage that no delivery promises are being made, orders being accepted for shipment under the quota system when they can be scheduled. Determination of mill backlogs is practically impossible, further than that output is covered well into next year. Despite strike threats against important sheet consumers shipments are being taken fully, with storage arrangements to tide over expected interruptions. Some producers are out of the market.

Pittsburgh — Sellers are screening new business more carefully as orders continue to exceed production schedules. It is believed consumers are seeking to buy light flat-rolled steel tonnage in excess of their known manufacturing schedules and there is much shopping with probability of considerable duplication in orders. Mills are not turning down orders, but they are accepted without definite delivery promise. Sellers are not scheduling production more than three months ahead, and consequently a true picture of order backlogs is not obtainable. Despite prospect of disruption to production in the automotive and other industries, pressure for early steel delivery continues acute, and there are indications arrangements have been made for stocking steel in event of strikes, for such interruptions to production schedules are not expected to last long. Pre-war customer rela ships and emphasis on production o more remunerative items are the upon which sellers today are distr ing available tonnage. Rough estim of delivery schedules on present backlogs place cold-rolled sheets in ril and May, hot-rolled pickled n as far extended, with electrical and vanized sheets in late second qu

New York — Most sellers of ho cold-rolled sheets still have diff setting up quotas for first quarte though the necessary lead time is at hand. Most count on a 45-day although one large interest has de upon a 30-day lead on hot-rolled s

Sellers generally are directing tion to first quarter only on hot cold sheets and as they already ha more tonnage offered than they can ply in that period, they are to all tical intents out of the market. producer of electric coated sheets, not setting this material up on a basis, withdrew from the market days ago. Within a period of three this seller's deliveries had jumped February to July.

Boston — Heavier buying of n cold-rolled strip for typewriter a bly parallels sharp increases in pr tion goals; Royal Typewriter Co., ford, Conn., aims at 12,000 a week next year, compared with 8400 p Sold through first quarter, cold strip are booking for the second, alt some producers are holding orde abeyance beyond end of March. cators, striving to get up production seeking materials for inventory in tion to nearby requirements. sheets there is evidence of duplica quiry. Within sheet quotas ther few openings for first quarter. De for cold-rolled is heavy, including tons for bumper stock. Light gag especially scarce and most contrac minated surplus, which included siderable 22-gage has been abs

Cincinnati — Pressure for sheet eries has been increasing, with dissatisfaction over tonnage allo Mills attempting a quota system encountered cases where tonnage that taken in 1940 is sought. The backlog has disappeared from d sions, orders being definitely acc when the tonnage is scheduled for ing, on a month-to-month basis. ness of supply is indicated by the e ness with which occasional offerin odd specifications are seized.

St. Louis — Sheet production h has risen to about 80 per cent o pacity, compared with 65 to 70 pe a month ago. This is due mainly to ter labor supply. Finishing labor tinues scarce. Flat-rolled products erally are sold to fourth quarter of although some capacity is open in and July for galvanized sheets, a April for tin plate. Virtually all ton is allocated to district offices for ment.

Birmingham — Sheet productio slightly better than 60 per cent o pacity and civilian demand has incr until loss of wartime tonnage is not Demand is much greater than o and mills have heavy commitments

Cleveland—Production of sheet strip will be curtailed for several mo due to the unfavorable labor situa Mills are making some progress in re

...rations to the pre-coal-strike level ...t are unable to increase them sufficiently to reduce order backlogs. Mills ...ally are not making firm delivery ...ises and some open books for only ...quarter ahead.

...eel companies have adopted quite ...ally a policy of selective selling, ...ing sales in territories where any ...able freight or e x t r a handling ...es must be absorbed and discourag...placement of orders for products on ...the profit margin is smallest. One ...consumer reports that mills in some ...ses have been shipping him heavy ...sheet instead of light plate which ...rmally uses. This proves more ...ble and conserves plate tonnage ...stomers who cannot shift to the ...f sheet.

...icago — New sheet business is ..., but pressure for deliveries is not ...rease, the latter situation being dif...t to comprehend. All mills employ ...own rationing system in allotting ...s to consumers. In one instance, a ...aker requires that customers file ...cations against cold-rolled sheet ...ents on order books 30 days in ad... of the month of rolling. This pro... can accept no new business on ...lled sheets and strip for delivery ... April, and cold-rolled before ...

...adelphia — Where sheets are not ... sold on a strictly quota basis de...s on hot and cold-rolled material ...ble in second quarter and early ..., in certain instances, with excep...in heavy gages. Galvanized sheets, ... quotas, are promised for late ...d July. Some leading sheet sell... carrying the same warehouse ... was set up during the war and ..., a then, are falling far short of ...g distributors what they want. Job... ordering further ahead than ... in the fall, some buying through ..., not only in sheets but practically ...products.

...el Bars . . .

Bar Prices, Page 200

...all sizes of carbon bars are sold ... into next year, some producers be...booked into third quarter. On me... and large diameters deliveries ...be promised for first quarter. Alloy ...e easier than carbon and in some ...ses December delivery can be had. ...-drawn bars are promised for Jan... and February.

... York — Some sellers are endeav...g to set up hot carbon bars on a ... basis; others are not. There is a ...erable scarcity in small sizes, with ...e sellers actually booked into third ...; however, medium and large ...ds are still available for shipment ... first quarter in some important ...zes. Certain producers, in fact, ...ill quote February on large sizes. ... alloy bars can still be had in some ...rs for shipment in late December, ...gh most producers appear to be in ... stronger position. Hot heat...ed alloy bars are running four to ... weeks beyond.

...tsburgh — Mills are scheduled into ... on small carbon bars, but large ...ds and alloys are promised for early ... quarter delivery. Due to restricted ...uction resulting from limited sup... of carbon bars, cold-rollers are now booked well into first quarter. Pressure for delivery of all bar products is heavy, although some easing has developed in isolated instances. Automotive, farm and railroad equipment manufacturers are accepting all tonnage scheduled for early shipment and continue to place commitments for second quarter delivery. With mill schedules on carbon and alloy steel bars gradually recovering, consumers in turn are stepping up operation from the low point reached in the week following the coal strike.

Boston — Most bar fabricators are completing the cycle back to normal products; earlier confusion affecting grades and sizes is clarifying. Larger forge shops, producing for the automobile industry instead of aircraft, increase carbon specifications in ratio to alloys and need smaller sizes. This holds to some extent with other fabricators and accounts substantially for the slack in alloy buying. Most consumers, including textile mill equipment builders, have covered well into first quarter, and there is a lull in new orders.

St. Louis — Pressure is increasing for bar tonnage and deliveries have been deferred into May and June.

No deliveries are promised before February. Mills, striving to complete repairs before the end of this tax year, are operating about 25 per cent under capacity. Full operation is not expected before mid-January. No relief in pressure is expected before third quarter unless duplication of orders is larger

than expected. Labor supply for bar mills is improving.

Boston — Starting Dec. 1 another large supplier of carbon bars will allocate definite tonnage to customers through first quarter on a monthly basis and will ask cancellation of tonnage in excess of allotments. The same producer will put into effect a like policy on shapes and bar shapes, starting Jan. 1.

Cleveland — Considerable steel bar tonnage was lost here last month due to the fuel shortage and deliveries from several mills have not been up to schedule. This will necessitate readjustment in delivery schedules for several months. Deliveries on new business are extended, with one large interest having no open space before late next year on small sizes of hot-rolled bars and first quarter on larger sizes. Cold-rolled bars are available in February. Automotive partsmakers are still active in the bar market.

Chicago—Deliveries on both quality and hot-rolled carbon bars are extending further, evidencing general heavy buying of consumers. Most manufacturers have unbalanced inventories and seek to round them out. April and May are the prevailing delivery dates on all grades of carbon bars; alloys on the other hand are available in December through January.

Philadelphia — Emphasis in hot carbon bars continues in light sizes. One leading producer is out of the market on rounds 1½ inches and smaller until July and on small bar-size channels until August. On all other sizes, however, this interest can supply at least a limited supply for March. The situation with other producers varies, with some able to supply hot carbon bars for February. Cold-drawn carbon bars are quoted generally for late January and February.

Steel Plates . . .

Plate Prices, Page 201

Plate demand is increasing and the situation is tightening, important sellers now quoting February and March. One factor is diversion of semifinished steel to other products. Fabrication of small tanks, mainly for gasoline stations, accounts for considerable tonnage. Plate demand is better than had been expected.

Boston — Plate requirements for railroad passenger cars are higher, further increasing the ratio of light material. The $1.5 million expansion by Pullman-Standard Mfg. Co., Worcester, Mass., includes installation of much additional heavy welding equipment. Railroads are buying sparingly, less than expected. In other directions, notably small tank and boiler shops, orders are better than estimated. Substantial portion of heavier plates moving is to flame-cutting and weldment shops. Depending on production lost and availability of semifinished, deliveries among mills vary as much as two months with January delivery still possible with the more fortunate producers. Surplus at the Walsh-Kaiser shipyard, Providence, R. I., is coming out for liquidation.

New York — While sheared plates are still available in January and February, the situation is steadily tightening, due in part to diversion of metal to other products. Demand is more active than a month ago and in general is in excess of trade expectations. Export demand, following a brief lull, again has picked up sharply, some producers declare. Demand for light gage plates, and also sheets of heavier gages, for fuel oil storage tanks continues strong. Several large oil companies have extensive programs for filling stations. Sun Oil Co., Philadelphia, for instance, plans construction of 400 service stations during the next 12 months.

Birmingham — Plate production is at about 50 per cent of the wartime peak with heavy backlog and insistent demand for deliveries. Tankmakers account for a large part of current demand. A fair tonnage of plates is still needed for shipbuilding.

Chicago — One of the amazements in steel circles is tightness which has developed in steel plates. However, general demand from heavy industries, such as tank and railroad car building, has taken up the slack. One important platemaker in this district is unable to schedule new business on wide plates before March and narrow sizes before June.

Philadelphia — Plate demand is expanding and while shipments can be maintained in January some producers are booked solidly into February and March. Three plate producers, including two district mills, shared in more than 5000 tons for the 160 locomotives recently booked by Baldwin Locomotive Works for France. Forty additional locomotives are pending for France, bringing recent requirements to 360.

Tubular Goods . . .

Tubular Goods Prices, Page 201

New York — With winter approaching demand for merchant pipe for maintenance and repairs has now about reached its fall peak. Distributors, who generally are now obtaining pipe from mills on a restricted monthly quota basis, are having difficulty keeping supplies in balance.

Finished and cold-drawn carbon tube are not distributed on a quota basis and deliveries now fall mainly in January, although in certain items of cold-drawn tubing February is being quoted. Alloy tubing shipments range five to eight weeks on hot-finished and certain other descriptions. Light aircraft and mechanical tubing can be had for delivery within a month.

Pittsburgh — Sellers are booked into second quarter on standard merchant pipe and little headway has been made in improving delivery in recent weeks. Requirements on pressure and mechanical tubing are not extended as much, with boiler tubes available in January and February and cold-drawn mechanical tubing in December. Mill delivery position on tubing compares with eight months' extended shipment schedules at the peak in war requirements. Pipe jobbers' inventories are well below normal, but there appears to be little possibility they can be restored to desired levels this year. The Navy's surplus goods disposal office here will take bids Nov. 23 on 1,035 feet of SAE 1020 cold-rolled steel.

Cleveland — Operations at pipe mills are gradually returning to normal following curtailments last month due to coal shortage. Output of one large company, cut to 44 per cent of schedule, will reach between 55 and 60 per cent this month and is expected to reach 100 per cent by the yearend. This loss in production will delay scheduled shipments several months and has extended deliveries on new business to second half in most sizes. Most demand now is from manufacturers, although jobbers' stocks have suffered. Mills are attempting to eliminate duplication of orders but many are not accepting new customers.

Pipe mills are in comfortable position on oil country goods with open positions in each month of first quarter. Heavy demand is pending. Inquiry includes several lines of 10 to 20 miles, totaling 5000 to 10,000 tons each of 8 to 12¼-inch. Heavy export business is developing in a highly competitive market. An English firm already has shipped a large tonnage of seamless casing to Venezuela and promises six months' delivery on South American shipments. French, Czechoslovakian and Polish firms may enter the market some time next year.

Wire . . .

Wire Prices, Page 201

New York—Although makeup of wire mill backlogs has shifted substantially with most producers, aggregate volume approaches wartime peak, with no place for many items before second quarter. Mills are screening and allocating orders as pressure is strong, fabricators claim they are pinched for some types of manufacturers' wire, springs and high-carbon flat material. Galvanizing departments of some mills are crowded and additional orders are held up. Demand for cold-heading wire is unabated.

Boston — No easing of pressure for wire deliveries is apparent and with heavy backlogs, orders for second quarter and beyond are numerous on a wide range of specialties. Producers are rationing available tonnage, generally on a monthly basis through first quarter, including razor blade stock and clock spring wire. Expecting heavier production early in the year fabricators of finished wire products are buying for inventory in addition to nearby requirements and most of this inquiry cannot be processed before second quarter.

Pittsburgh—Further reduction in dealers' inventories of merchant wire occurred the past few weeks, and on the basis of prospective demand and production the remainder of this year, likelihood of building stocks during this period is not promising. The fact that current production is falling behind immediate needs prevents accumulation to meet heavy requirements expected next spring. Nails and fencing are in particularly short supply.

With elimination of production quotas Oct. 1 many dealers and consumers have placed orders for substantially larger tonnages than during the war. In contrast to heavy increase in orders, output has made only a slight gain for steel producers have been forced, under present price ceilings, to place emphasis on

output of other steel items. Order backlogs for fencing, barbed wire, nails and other merchant wire items extend through first quarter. In most instances, orders on mill books are larger than at any time during the war.

Tin Plate . . .

Tin Plate Prices, Page 201

Pittsburgh — Despite reports that tin mines in the Dutch East Indies are in better condition than earlier predicted, no easing in WPB order M-81 is probable until further clarification of the overall tin supply situation. It is held that lifting of controls over tin would result in rapid dissipation of tin stocks (estimated at about 30,000 tons) and a period of dearth in which there would be insufficient supplies either for essential food preservation or for minimum industrial requirements. The first easing in the order restricting use of tin is likely to be in lifting of regulations governing application of 0.25-pound electrolytic tin plate coatings. WPB recently pointed out that through restrictions consumption of tin in the canning industry has been reduced from 42,000 tons in 1941 to an expected figure of 24,000 tons in 1946; strict conservation has brought the use of tin in automobiles from almost four pounds per car before the war to less than two pounds today.

Rails, Cars . . .

Track Material Prices, Page 201

New York — Domestic freight car awards in October involved 1320 units, compared with 12,840 in September, highest for the year to date. Bookings for the first 10 months amount to 39,666, against 36,911 in the corresponding period of last year.

Indications point to a larger total for the current month, with outstanding pending inquiries previously noted, involving 1000 automobile box cars for the Southern Railway, 600 cars for the Nickel Plate and 550 for the Elgin; Joliet & Eastern. Meanwhile, passenger car demand continues to expand, with current inquiry heaviest since before the war.

Structural Shapes . . .

Structural Shape Prices, Page 201

Chicago — New business coming out in substantial volume recently is giving structural fabricators heavy backlogs. This, coupled with the fact that deliveries on plain material from mills are becoming more extended, is forcing many fabricators to decline to quote on many jobs. Awards of over 100 tons in the midwestern area in the past few days has aggregated in excess of 14,000 tons, and in addition there have been innumerable small lettings. New inquiry is much lighter. Some district mills are unable to promise heavy sections before February and light before July.

Boston — Potential structural steel requirements are substantial, but actual inquiry and lettings are down; for the racetrack grandstand at Lincoln, R. I., 600 tons are placed, third pony run in the smallest of states. To the heavy backlog of work held by Stone & Webster Engineering Corp., Boston, is added a steam electric generating station for Standard Oil Co. at Whiting, Ind. While January delivery on larger sizes of plain shapes is possible with some mills, small sizes are in February and beyond with producers not pressing for tonnage in the latter range.

Birmingham — Demand for shapes is heavy and consistent, producers being unable to meet demand for current needs. Bookings are solid for the remainder of the year and into next.

Philadelphia — While shape mills and fabricating shops are extending backlogs, building demand locally is light. One large producer is quoting March and April on standard shapes and February and March on wide-flange. February appears the best that can be done on both standard and wide-flange.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 201

Chicago — Inquiries for reinforcing bars and other material are going begging here because of the tight steel situation. Supply is far below demand and suppliers restrict activities to projects they can handle if they prove successful bidders. Even the most optimistic interests see little improvement during the remainder of the year.

Pig Iron . . .

Pig Iron Prices, Page 203

Pig iron production is improving as banked stacks resume after the coal

strike, but inventories still are short. Labor supply in foundries shows some improvement, though still tight. In spite of recent low production melters have been supplied sufficient to avoid shutdowns.

Pittsburgh — Pig iron production here is now back to about normal with 45 out of 54 units active, compared with only 24 at one time during the period of the coal strike. Some units are still idled because of inadequate fuel supply, with at least one furnace blown out due to unprofitable operations under present price ceilings, but most are down for relining. Labor shortage continues an important factor in retarding full utilization of available units. While supply of pig iron is in very close balance with requirements, no foundries have had to curtail operations for lack of iron.

New York — On a daily basis November pig iron production in this district is expected to be somewhat higher than in October. However, in view of the extra holidays and the fact that November is a shorter month than last, total output is likely to be smaller.

Foundrymen are encouraged by a somewhat improved labor supply. In the Brooklyn area, for instance, there are now actually more coremakers than there are jobs and the situation with respect to molders is improving. However, there is still considerable shortage in molder's helpers.

Boston — Pig iron melters approach winter with inventories frequently under 30 days; past experience indicates this is a dangerously small margin, but likelihood of early improvement in supplies is encouraging, although some consumers have permits to stock over 30 days if they can get the iron. With water route moving, one steelworks has iron from the Troy, N. Y., furnace to last into next year; this unit is now running foundry and malleable. Buffalo is making some progress on overdue deliveries.

Cincinnati—Pig iron is being received by district melters in volume to maintain operations. Some lag in shipments reflects recent furnace curtailments, but this is having no serious effect. A feature is the almost general request for more iron, by an estimated 25 per cent, this month than last. Undoubtedly some requests are with intent to bring inventories closer to the 30-day basis, after depletion of stocks during coal mine strikes. Demand for castings is sustained; stove foundries are expanding output as rapidly as possible.

Buffalo — In spite of tonnage lost because of strikes, leading pig iron producers report a self-rationing program has been successful in keeping foundries in operation. However, melt is down, as iron was apportioned to foundries which had coke and could operate. Civilian backlogs of foundries are expanding with makers of stoves, radiators, furnace and automotive castings call for more iron. Production in this district is curtailed to about 80 per cent of capacity.

Chicago — Foundries continue to operate on small iron supply. So far as can be ascertained, however, no shops have been forced to curtail from iron shortage. However, it will be impossible to make up lost production and a critical situation seems certain for the balance of the year. Currently, 32 of the district's 41 blast furnaces are operating. During the past week, Carnegie-Illinois Steel Corp. has returned five stacks to activity, and Inland Steel has returned one.

Philadelphia — Demand for foundry pig iron is accelerated by improved foundry operations and lack of cast scrap. Improved melt is ascribed to a slight gain in labor. Basic requirements are gaining as ingot production recovers. First quarter contracting is expected to start soon.

Scrap . . .

Scrap Prices, Page 204

Scrap scarcity continues, although sufficient is being gathered to serve current needs. Melters continue to take all tonnage offered and seek to add to reserves for winter. Higher freight equalization and springboards are being paid to obtain supplies from remote points.

Pittsburgh — Movement of iron and steel scrap is well sustained following the lull during the coal strike. It is becoming increasingly difficult to meet steady demand for heavy melting steel and cast scrap, although in connection with the latter consumers are more inclined to pay higher freight equalization as result of recent boost of 75 cents per gross ton in pig iron prices. Up to $1 freight equalization continues to be paid for machine shop and short shoveling turnings, while $1.50 springboard on heavy melting steel is reported. Recent offers of landing mat scrap all went at

ceilings, some of which found its way into this district, making the delivered price slightly over $20 a ton after payment of $7 freight from Fort Eustis, Va., and 50-cent brokerage commission.

Scrap dealers state they are unable to compete with consumers for unprepared scrap and have petitioned OPA to increase the spread between prepared and unprepared material to $5 from the present $3.50 a ton.

Cleveland — Tightness continues in scrap, steelmakers needing more than suppliers are able to obtain and more costly grades continue to be bought for open-hearth use. While restoration of fairly normal pig iron supply has eased the situation slightly demand has not reflected this to any extent. Blast furnace grades are in strong demand and cast grades continue scarce.

Buffalo — Mills appear willing to take as much scrap as dealers can obtain. A sale of 10,000 tons is reported and another large lot is expected to be placed soon. Increased receipts by water is expected as the navigation season closes. A cargo of 5000 tons from Duluth and about 8000 tons by barge from the seaboard have arrived and two more barge fleets with 5000 to 8000 tons are expected. Specialties are scarce here because of shipments to Valley consumers.

Chicago — Scrap maintains activity and ceiling prices prevail. Shipments are high although available supply is well below demand. Steel mill operations are again approaching full capacity and banked blast furnaces are resuming to provide normal amount of hot metal. Although it is generally believed the scrap will remain tight through the winter, no critical shortage is anticipated.

Boston — Demand for good quality heavy melting steel is active; supply of No. 1 dealer scrap and carbon turnings is limited. Railroads and shipyards have moderate tonnages with indications liquidations at the latter will increase. Some tonnage offered as contract terminated surplus will eventually be sold as scrap. In holding strictly to specifications as to carbon steel, consumers are buying bundles from regular sources. Steelworks have around 45-day inventories, but seek tonnage to hold at least at that level for winter. Cast grades are still tight.

Although the lot was smaller, 600 tons, bidding at ceiling is keen for landing mat material, more consumers quoting direct. This scrap is attractive, unprepared, but readily sheared in form of pierced steel planks, component parts of airfield mats, 16½ inches wide, 10 feet long and ⅛-inch thick. In wired bundles of 30 pieces each, a unit weighs approximately 1900 pounds. Delivery is f.o.b. Boston port of embarkation with daily carloading 20 to 25 cars. Eight quoted ceiling, $11.55, f.o.b. Boston, and four over ceiling, Luntz Iron & Steel Co., high at $12.33 wiring to ship to Canton, O., yard.

Cincinnati — Demand for iron and steel scrap, despite lack of heavy buying, is well sustained. All grades are moving steadily as major melters seek to retain reserves. Tightness in pig iron and a temporary curtailment in hot metal also increased scrap requirements. Prices are firm, but so far there has been resistance toward remote material on which higher freight was asked.

St. Louis — Improved yard labor

supply has increased scrap shipments and receipts from remote points are better. Terminated war contracts offer some tonnage. Demand for foundry grades lags. Two plants of the American Foundries have been out of the market for two months, which has affected foundry scrap. Open-hearth buying is at average rate.

Los Angeles — Shipyard and aircraft scrap production is virtually at an end. Before these have been the principal sources of scrap in southern California dealers believe collections will be uncertain until automotive scrap appears. Prices continue $5 to $6 under ceilings for No. 1 heavy melting. Mills are no longer competing with dealers as their offerings now are unprepared. Oversupply is adequate.

Birmingham — Scrap supply is tight, with steel and foundry grades being in steady demand at ceiling prices. With the blowing of a repaired blast furnace within the next fortnight pressure will be relieved somewhat.

New York — Pittsburgh buyers again have entered the local scrap market, paying up to $1 springboard on heavy melting steel. This demand, in addition to substantial requirements for eastern Pennsylvania and Sparrows Point, is absorbing heavy melting steel about as fast as it is being prepared. Shortage of cast scrap and borings and turnings becomes acute.

Philadelphia — With possibly two exceptions, consumers of heavy melting steel are buying freely to build winter stocks. One buyer is out of the market because production has been heavily hit by maintenance cancellations and until recently by a strike of several weeks, and others are drawing on inventories, as far as can be learned. Reconversion scrap is coming out in substantial quantities and is accumulating at yards because of labor shortage. However, prices for this are holding fairly well and in the case of landing mat steel very well. Latest sales of 12,000 tons of landing mat scrap at Fairfield, Va., brought ceiling, successful bidders including one from the middle west. Borings, turnings and cast are exceedingly scarce.

Warehouse . . .

Warehouse Prices, Page 202

New York — Warehouse stocks are becoming more unbalanced and depleted with no overall improvement in replacements; under quotas, designed to spread mill volume, distributors are getting considerably less tonnage than under 1942. Demand for warehouse steel, however, approaches wartime peaks, with larger inquiry for plates and alloys, which have lagged. Galvanized and some black sheets, shapes and strip are tight with most jobbers, with inquiries coming in from distant points, including Pittsburgh.

Pittsburgh — Shipments out of distributors' stocks improved 10 to 15 per cent last month. Unusually heavy demand is noted in sheets, strip, small bars and structurals. Interruption of mill rolling operations, resulting from the steel strike, has accentuated unbalanced inventory. Distributors are in the same position as individual consumers in the scramble for available steel production.

Los Angeles — Warehouse business is about 60 per cent of the wartime peak,

with number of orders about the same but for smaller quantities. Polished stainless sheets and cold-finished shafting are in heavy demand. Mill deliveries are months delayed as a result of the coal strike.

Cleveland — Warehouses received less steel last month than scheduled, throwing their stock further out of balance. Bar stocks, especially ½-inch and smaller, and wire products are tight. Alloy products, however, are comparatively easy. Average size of orders has increased well above normal, many being for 1500 tons and up.

Iron Ore . . .

Iron Ore Prices, Page 202

Lake Superior iron ore moved in October totaled 9,826,622 gross tons, compared with 10,594,988 tons in the comparable month last year, according to the Lake Superior Iron Ore Association, Cleveland. This was a loss of 768,366 tons, 7.25 per cent. October tonnage included 47,437 tons of Canadian ore loaded at Superior, Wis., in addition to that loaded at Michipicoten and Port Arthur. Details of October shipments are as follows, in gross tons:

	October, 1945	October, 1944
Escanaba	472,484	759,1[illegible]
Marquette	557,142	381,8[illegible]
Ashland	550,856	762,7[illegible]
Superior	3,267,999	3,102,3[illegible]
Duluth	2,749,682	2,744,7[illegible]
Two Harbors	2,120,888	2,782,9[illegible]
Total U. S. Ports	9,725,051	10,531,[illegible]
Michipicoten	70,621	63,[illegible]
Port Arthur	30,950	[illegible]
Total Canadian	101,571	63,[illegible]
Grand Total	9,826,622	10,594,9[illegible]

Decrease from year ago, 768,366 tons, [illegible] per cent.

For the season to Nov. 1 cumulative shipments totaled 71,498,393 tons, compared with 76,498,172 tons to the same date last year, a decline of 4,999,[illegible] tons, 6.54 per cent. For the season to Nov. 1 Canadian ore loaded at Superior totaled 297,408 tons. Details of season shipments are as follows, in gross tons:

	To Nov. 1, 1945	To Nov. 1, 1944
Escanaba	4,201,574	5,222,1[illegible]
Marquette	3,582,864	3,505,3[illegible]
Ashland	4,070,860	5,269,4[illegible]
Superior	23,256,402	24,664,7[illegible]
Duluth	19,175,774	19,384,0[illegible]
Two Harbors	16,688,895	18,088,3[illegible]
Total U. S. Ports	70,976,369	76,081,[illegible]
Michipicoten	414,937	416,4[illegible]
Port Arthur	107,087	[illegible]
Total Canadian	522,024	416,4[illegible]
Grand Total	71,498,393	76,498,17[illegible]

Decrease from year ago, 4,999,779 tons, 6.54 per cent.

Canada . . .

Toronto, Ont. — With demand gaining steadily, consumers meet more difficulty obtaining steel for current needs. Buying is maintained at a brisk pace and on some materials producers already have filled books for first quarter. Sheet plate is about the only material still available this year and there is no rush by plate consumers to add to their bookings. Canada's plate production now is entirely from Ontario mills as the Sydney plate mill that was taken over

by the government about a year ago has been closed down. Steel production in Nova Scotia also is well down from the year's high rate. While Ontario mills are working at virtual capacity on ingot production there has been minor slowing up in some rolling departments.

The labor situation has shown a radical change in the past month or six weeks and instead of a surplus of jobs, many workers now are looking for employment and National Selective Service has abandoned many of its restrictions in an effort to keep workers employed. However, mining companies, steel plants, and some of the heavy industries are seeking workers, and there is still shortage of skilled labor. With the exception of the strike at the Windsor plant of the Ford Co. of Canada, labor troubles have been minor, although a number of small disputes have been reported recently.

Up to this time there has been no easing in sheet supply and consumers have difficulty obtaining enough for current needs, with the result that civilian production continues to lag. Galvanized sheets are specially scarce and it is reported that even supplies for some small jobs are not available. Warehouse stocks of sheets have almost disappeared and no replacements are reported. However, there is hope that there will be improvement in the sheet supply around the end of this month when the new sheet and strip mill goes into production at Hamilton.

Structural steel lettings are increasing and producers report backlogs well into 1946. Fabricators also are operating close to capacity and are from a month to six weeks behind on deliveries. It is stated that prospective orders for structural shapes now exceed 50,000 tons for projects to be started early in the new year, while awards for the past week amounted to approximately 8000 tons.

The scrap shortage is becoming more acute daily, and dealers state that there are no indications of early improvement. Receipts continue to fall off and only small quantities now are coming from industrial plants and there is a steady drying up of shipments from rural districts. Scrap reserves are at the lowest point in many years and there is little hope of consumers obtaining sufficient for winter needs without assistance from the United States. Dealers state that lifting of ceiling prices would not improve the supply from Canadian sources, as the scrap is not there.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1500 tons, various locations, for Atchison, Topeka & Santa Fe railroad; 4990 tons, timber trestle caps, to Joseph T. Ryerson & Son Inc., Chicago; 382 tons, beam spans, to Bethlehem Steel Co., Bethlehem, Pa.; 64 tons, turntable repairs, to American Bridge Co., Pittsburgh; bids Oct. 8; erroneously reported in STEEL for Oct. 22 as awarded to Kansas City Structural Steel Co., Bethlehem Steel Co. and Consolidated Steel Corp. of Texas, respectively.

1000 tons, assembly plant, Hopeville, Ga., for Ford Motor Co., to Ingalls Iron Works, Birmingham, Ala.

2650 tons, foundry, pattern shop and power house, Saginaw, Mich., for Chevrolet Motor Car Division, General Motors Corp., to American Bridge Co., Pittsburgh; bids June 5.

1500 tons, aero coach plant, East Chicago, Ind., for General American Transportation Corp.,

to American Bridge Co., Pittsburgh.

1200 tons, plant for Hercules Powder Co. at Parlin, N. J., to Ingalls Iron Works, Birmingham, Ala.

1200 tons, factory building, Grand Rapids, Mich., for Diesel Equipment Division, General Motors Corp., to R. C. Mahon Co., Detroit.

950 tons, addition to plant, Milwaukee, for Froedtert Grain & Malting Co., to Milwaukee Bridge Co., Milwaukee; bids Oct. 22.

680 tons, new building, Indianapolis, for E. C. Atkins & Co., to Central States Bridge & Structural Co., Indianapolis; bids Oct. 22.

617 tons, 12 girder spans, Cheyenne, Wyo., for Union Pacific railroad, to Kansas City Structural Steel Co., Kansas City, Kans.; bids Oct. 30.

520 tons, Immaculate Conception School, East Thirteenth St., Manhattan, to Bethlehem Fabricators, Bethlehem, Pa., through George A. Fuller Co., general contractor.

500 tons, du Pont Sabine river works, Orange, Tex., to Consolidated Steel Corp., Los Angeles.

500 tons, can factory and warehouse, Sacramento, Calif., for Continental Can Co., to American Bridge Co., Pittsburgh.

426 tons, highway bridge over Fox river at Oneida street, Appleton, Wis., to Bethlehem Steel Co., Bethlehem, Pa.; L. G. Arnold Inc., Eau Claire, Wis., contractor; bids Oct. 16.

420 tons, three buildings for Otho Pharmaceutical Co., Bridgewater Township, N. J., to Bethlehem Steel Co., Bethlehem, Pa., through John W. Ryan, New York, general contractor.

275 tons, mill building, Aurora, Ill., for All-Steel Equip Co., to Joseph T. Ryerson & Son Inc., Chicago.

142 tons, conveyor head, Hurley, Wis., for Pickands, Mather & Co., to Wisconsin Bridge & Iron Co., Milwaukee; bids June 12.

Unstated, Ford parts and distribution building, Seattle; to Virginia Bridge Co., Roanoke, Va.

STRUCTURAL STEEL PENDING

1100 tons, buildings Nos. 18, 20, 21 and 22, Lansing, Mich., for Fisher Body Division, General Motors Corp.; bids Oct. 16.

600 tons, grandstand, race track, Lincoln, R. I.

450 tons, addition to warehouse, Chicago, for Central Steel & Wire Co.

400 tons, factory building, Kalamazoo, Mich., for Upjohn Co.

200 tons, drydock subdivision, Puget Sound Navy Yard; Scheurmann & Johnson, Seattle, low, $433,878.

Unstated, also tanks, pipe lines, etc., plant for California Asphalt Co., at Willbridge, Oreg., bids in at San Francisco.

Unstated, gantry and other cranes; bids to Reclamation Bureau, Denver, Nov. 28.

Unstated, Pudding River bridge, Oregon; J. F. Johnson, Newburg, low at $140,847.

Unstated, three structures at Troutdale, Oreg.; bids to Bonneville Power Adm., Nov. 16.

REINFORCING BARS . . .

REINFORCING BARS PLACED

300 tons, factory building, Proctor & Schwartz, Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, Ford Motor Co. at Chester, Pa., to Bethlehem Steel Co., Bethlehem, Pa., through Irwin & Leighton, Philadelphia.

200 tons, acid treatment plant, Whiting, Ind., for Standard Oil Co. of Indiana, to Joseph T. Ryerson & Son Inc., Chicago; M. W. Kellogg Co., contractor.

100 tons, Willow Springs grade separation over Chicago, Milwaukee, St. Paul & Pacific railroad, for Cook county, Illinois, to Joseph T. Ryerson & Son Inc., Chicago; bids Oct. 22.

REINFORCED BARS PENDING

4750 tons, intercepting sewer, Chicago, for Chicago Sanitary District; bids Nov. 8.

100 tons, store, Peoria, Ill., for Woolworth Co.; V. Jobst & Sons, Peoria, Ill., contractor.

PLATES . . .

PLATES PLACED

Unstated, 36-inch water system extension for Portland, Oreg., to Steel Tank & Pipe Co., Portland.

PLATES PENDING

833 tons, sheet steel piling for Port of Grays Harbor, Wash.; bids in at Aberdeen, Wash.

Unstated, 1020 feet 20-in. steel pipe for Yakima project; bids to Bureau of Reclamation, Yakima, Wash., Nov. 20.

PIPE . . .

CAST IRON PIPE PENDING

500 tons, various sizes, for Yakima, Wash.; bids Nov. 13.

100 tons or more, Oak Lodge district, 4 and 6-in., Portland, Oreg.; bids in.

100 tons, Tracyton, Wash.; bids in.

100 tons or more, Camas, Wash.; bids Nov. 13.

100 tons or more, Colville, Wash.; bids Nov. 6.

RAILS, CARS . . .

RAILS PLACED

Pennsylvania, 156,000 tons, for 1946 delivery, 78,000 tons to Carnegie-Illinois Steel Corp., 69,000 tons to Bethlehem Steel Co., 9000 tons to Inland Steel Co.; 50,000 tons of accessories to be bought as required.

LOCOMOTIVE PLACED

The Alton, 10 diesel-electric 1000-horsepower switch engines, to American Locomotive Co., New York; authorized by federal court.

Pennsylvania, ten 6000-hp diesel-electric passenger locomotives to Electromotive division of General Motors Corp., La Grange, Ill.

Weaknesses in Surplus Property Set-Up Aired

(*Concluded from Page 94*)

policy the large chain store, the mail order house and the co-operative would be eligible to buy at the 'big retailer' price level, which is at a discount of 10 per cent below the highest price charged the smallest retailer."

His office could not agree with this policy, said Mr. Bradley, "not only on the ground that it is commercially unsound but also because in my opinion it violates a number of the provisions of the Surplus Property Act (that section pertaining to small business particularly) and is in direct violation of the Price Control Act, the Robinson-Patman Act, and OPA pricing policy.

"To illustrate the latter violation," he continued, "we need only to look at the new Surplus Property Administration's recommendation for pricing the several million shotgun shells recently offered by OSP. Had we followed the pricing schedule furnished us in writing by the Surplus Property Administration the shells would have been sold as follows:

Wholesalers	$28.52	per 1000
Large retailers and chains	31.11	" "
Average retailer	32.41	" "
Small retailer	33.71	" "

"The Office of Price Administration's published ceiling covering sales by manufacturers to wholesalers is $25.93 per 1000 shells, the ceiling price to retailers (large or small) is $32.41."

CONSTRUCTION AND ENTERPRISE

OHIO

BARBERTON, O.—Ohio Brass Co. plans a one-story 146 x 400-foot plant addition estimated to cost about $250,000. C. W. Conklin, Farmers Bank Bldg., Mansfield, O., is architect.

CLEVELAND—Cleveland Steel Products Co., 7306 Madison Ave., plans factory building on West 117th St., to cost about $500,000. George S. Rider Co., Terminal Tower, is consulting engineer.

CLEVELAND—George F. Adler Brass Foundry, 1510 University Ave., is having plans made by C. F. Guenther, 13124 Shaker Square, for four plant buildings, including 60 x 125-foot foundry, 40 x 125-foot core and pattern building, 40 x 40-foot furnace room and 35 x 40-foot office building, at Harvard Ave., and Jennings Rd., estimated to cost $75,000.

CLEVELAND—Mohawk Industries Inc. has been incorporated with $500 capital and 250 shares no par value to manufacture metal castings and equipment. Alfred H. Huck, 570 Morewood Parkway, Rocky River, O., is agent.

CLEVELAND—Anchor Foundry Co. has been incorporated with 1200 shares to manufacture foundry products. Benjamin R. Goldman, 513 Society for Savings Bldg., is agent.

CLEVELAND—E. F. H. Aluminum Foundry & Smelting Co., 3300 East 87th St., will build a one-story addition 40 x 175 feet.

CLEVELAND—Hampsted Mfg. Co. Inc., has been incorporated with $500 capital and 100 shares no par value to manufacture power tools and tool and diemakers' supplies. Albert Kline Jr., 5713 Euclid Ave., is agent.

GALION, O.—Carter Machine Co. has let contract to E. A. Hacker, 109½ Harding Way, for a 52 x 260-foot factory, estimated to cost $50,000.

MASSILLON, O.—Canton Metal Decorating Co., C. W. Lappin, president, 2808 Winfield Highway NE, is having plans drawn by Firestone & Motter, 1412 Cleveland Ave. NW, for a factory, estimated to cost about $100,000.

NORTH CANTON, O.—Spiker Products Co., 414 West Maple St., plans erection of a plant for manufacture of hangars for private planes, to cost about $40,000.

WARREN, O.—Peerless Electric Co. will build an addition 100 x 176 feet, two stories, on West Market St.

WARREN, O.—Falls Welding & Mfg. Co. has been incorporated with 250 shares no par value and will establish its operations on the site formerly occupied by the Pilgrim Trailer Co. J. Don Campbell, Warren, is agent.

MASSACHUSETTS

FRAMINGHAM, MASS.—General Motors Corp., Framingham, will let contract soon for a one-story 965 x 1035-foot assembly unit, 75 x 115-foot service unit, 32 x 35-foot acetylene unit, to cost about $1 million. Albert Kahn Associated Architects & Engineers Inc., New Center Bldg., Detroit, is engineer.

LOWELL, MASS.—City plans an incinerator to cost about $160,000. Stephen Kearney is city engineer.

CONNECTICUT

BRIDGEPORT, CONN.—Bryant Electric Co., H. E. Seim, president, 1421 State St., plans a three-story 95 x 240-foot finishing plant, to cost about $650,000.

BRIDGEPORT, CONN.—Progress Mfg. Co., M. C. Kitchell, manager, 140 James St., plans a two-story 45 x 75-foot plant to cost

about $40,000. E. Larson, 72 Brooklawn Parkway, Fairfield, Conn., is architect.

BRIDGEPORT, CONN.—City has plans for a sewage disposal plant to cost about $900,000. H. K. Gatley, Maplewood, N. J., is consulting engineer.

NAUGATUCK, CONN.—Town, Town Hall, has plans completed for a sewage disposal plant to cost about $250,000. M. Pirnie, 25 West 43rd St., New York, is consulting engineer.

NEW HAVEN, CONN.—Winchester Repeating Arms Co., Winchester Ave., plans a three-story 20 x 100-foot plant addition costing about $42,000.

STRATFORD, CONN.—Raybestos Div., Raybestos Manhattan Inc., East Main St., will let contract soon for a three-story factory and office building costing $85,000. L. Asheim, 211 State St., Bridgeport, Conn., is architect.

WALLINGFORD, CONN.—Boro plans sewage disposal plant and sanitary sewers to cost about $200,000. P. A. Merian, 356 South Orchard St., is consulting engineer.

NEW HAMPSHIRE

KEENE, N. H.—Pittsburgh Plate Glass Co., 632 Duquesne Way, Pittsburgh, plans a plant addition here, estimated to cost about $500,000.

NEW JERSEY

HILLSIDE, N. J.—Schacht Steel Construction Co., Inc., 446 Timpson Pl., Bronx, New York City, will start work soon on a structural steel fabricating plant on eight-acre site here. Building will be 200 x 375 feet, with two 5-ton and two 10-ton cranes. Fabrication will be continued at present plant.

NEW YORK

BROOKLYN, N. Y.—Steel Rolling Mill Co., 300 Meserole St., has let contract to Brown & Matthews Inc., 122 East 42nd St., New York, for a two-story 25 x 200-foot plant building. G. E. Tilt, care contractor, is engineer.

TONAWANDA, N. Y.—R. P. Adams Co. Inc., manufacturer of industrial filtration equipment, has announced plans for a $200,000 expansion program, including a $150,000 building.

PENNSYLVANIA

ERIE, PA.—Pennsylvania Electric Co., P. H. Harris, president, has plans for a 30,000-kw steam-electric generating station on the Allegheny river two miles west of Warren, Pa., estimated to cost over $4 million.

ILLINOIS

CHICAGO—Auto Molding & Mfg. Co., 2326 South Canal St., has let contract to Builders Co., 1420 South Michigan Ave., for a 100 x 150-foot plant to cost about $50,000.

CHICAGO—Wire Sales Co., 4630 West 54th St., is building a one-story 154 x 199-foot plant costing about $50,000. Buss & DeKreet, 7845 South Eggleston St., are architects.

CICERO, ILL.—Conlon Corp., 1824 South Laramie Ave., manufacturer of household washers and ironers, is building a two-story addition to be used partly for manufacture of heating pads and other items of expanded production. This building rounds out a $250,000 conversion program.

LA GRANGE, ILL.—Electro Motive Div., General Motors Corp. will let contract soon for a one-story 220 x 244-foot test and paint shop to cost about $2,500,000.

INDIANA

INDIANAPOLIS—ABC Foundry Inc., 1430 Madison Ave., has been incorporated with 34 shares no par value to manufacture forgings, by Elmer F. Lahman, Francis M. Jones and Carl J. Rieck.

KENDALVILLE, IND.—Board of public works, R. C. Moses, clerk, plans waterworks improvements, including 500,000-gallon elevated storage tank, water softening plant and mains, to cost about $162,000.

NEW ALBANY—Modern Forging Co. Inc., 1617 Vance Ave., has been incorporated with 600 shares of common and 250 shares preferred stock at $100 per share, to manufacture forgings, by F. G. Bentley, James A. Sink and Chester S. Wentzell.

SOUTH BEND, IND.—Roach Appleton Co. has let contract to Schumacher & Son, Mishawaka, Ind., for a plant building estimated to cost $200,000. E. D. Sessions, 1 North LaSalle St., Chicago, is engineer.

VINCENNES, IND.—Auto-Lite Battery Corp., R. G. Martin, president, Mulberry and Champlain Sts., Toledo, O., has let contract to Steinle-Wolfe Corp., Fremont, O., for a one-story 250 x 400-foot plant and office building, estimated to cost $300,000.

ALABAMA

BIRMINGHAM—Ford Motor Co., Dearborn, Mich., has let contract to Steel Construction Co., Birmingham, for an assembly plant at Hopeville, Ga., to cost about $500,000.

WISCONSIN

HARTFORD, WIS.—Maysteel Products Inc., 135 West Wells St., Milwaukee, is taking bids through A. J. Jordan, care company, for a one-story 60 x 175-foot plant building. C. C. Reynolds, 2526 North Oakland Ave., Milwaukee, is architect.

MINNESOTA

HOPKINS, MINN.—Minneapolis Moline Power Implement Co., Hopkins, has plans for a two-story 260 x 300-foot transite plant addition.

SAVAGE, MINN.—Continental Machines Inc., R. J. Wilkie, secretary, 1301 Washington Ave., Minneapolis, has let general contract to Leck Construction Co., 2834 Stevens Ave., Minneapolis, for a one-story 240 x 380-foot plant addition and one-story 50 x 60-foot boiler house, estimated to cost about $250,000. C. W. Smith, 1004 Marquette Ave., Minneapolis, is architect.

CALIFORNIA

LOS ANGELES—Western Arc Welding Co. has plans for a part three and part one-story building 100 x 100 feet at 755 Kohler St.

SOUTH GATE, CALIF.—General Motors Corp. has building permits for an office building costing $50,000 and a cooling tower costing $12,000, at 2700 Tweedy Blvd.

OREGON

PORTLAND, OREG.—California Asphalt Corp., subsidiary of Standard Oil Co. of California, 225 Bush St., San Francisco, plans asphalt refinery at Willbridge, Oreg., Portland suburb, to cost $1 million.

THE DALLES, OREG.—Northwest Chemurgy Co-operative, Wenatchee, Wash., plans six-story 90 x 250-foot starch factory and two three-story buildings for production of dextrose and glucose, to cost about $300,000.

SALEM, OREG.—State hydraulics commission has issued permit to California-Oregon Power Co. for a proposed $4 million Tokitee power project on North Umpqua river, involving two 2800-hp turbines.

WASHINGTON

EATONVILLE, WASH.—City has commissioned James W. Carey, Seattle, engineer, to prepare plans for a sewage disposal plant, sewers and water system, to cost about $185,000.

SPOKANE, WASH.—Washington Water Power Co. plans a substation with four 8333-kv transformers, indoor switchgear and two miles of transmission line.

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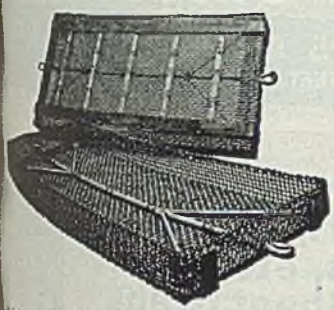

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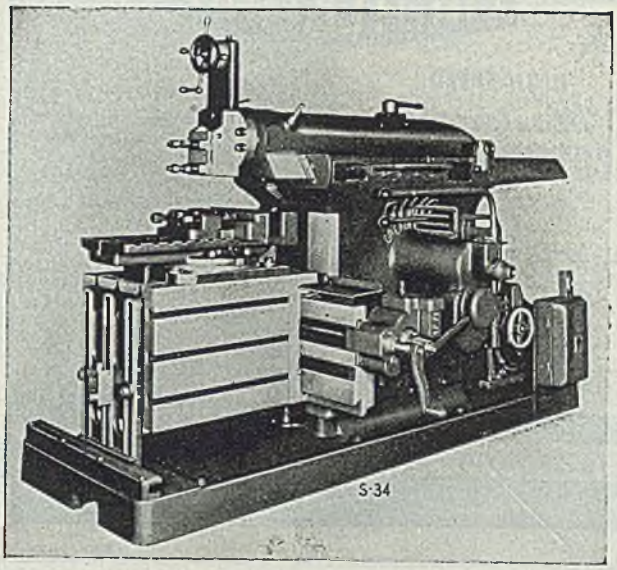

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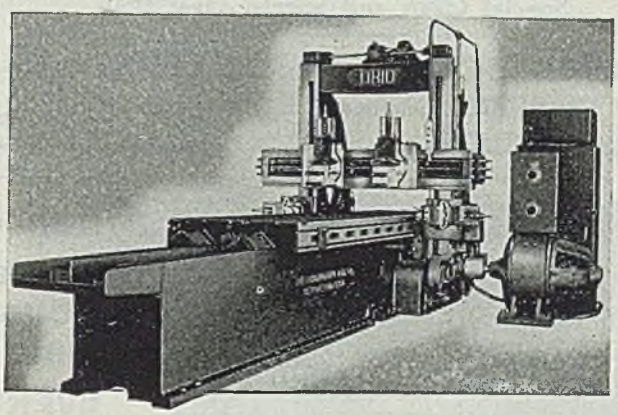

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Bids will be opened at
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Material available for inspection daily

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SHEAR, Open End 22″ blades 2-1/2″ sq. M.D.
SLOTTER, 12″ Putnam, 35″ table. B.D.
STRAIGHTENER PLATE, 110″ x 1-1/4″ H&J.
STRAIGHTENER, 42″ W-F, 11 roll, 2-5/8″ dia.
WEST PENN MACHINERY COMPANY
1208 House Bldg. Pittsburgh 22, Pa.

Help Wanted

sales engineer wanted for hydraulic presses and equipment

The sales division of an Eastern company has an opening for a thoroughly experienced man in the field of hydraulic presses, of both the accumulator operated and self-contained types, hydraulic machinery and hydraulic pumping equipment. Sound engineering background and a good sales personality are prime requisites. Salary open. Write giving outline of personal and business record. Interviews will be arranged at our expense for those who qualify. Letters acknowledged promptly and treated in confidence. Address:

Box 279,
STEEL, Penton Bldg., Cleveland 13, Ohio

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: 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 287, STEEL, Penton Bldg., Cleveland 13, O.

CHIEF ENGINEER: EXECUTIVE WITH ABILity to take full charge of all engineering, research, and development. Must be familiar with oil refinery equipment and construction, general steel plate construction, and general process equipment. Location midwest. Write giving full information, age, education, experience, salary, references, etc. Address Box 288, 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.

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DRAFTSMEN

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 furnaces, 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. Address Box 142, STEEL, Penton Bldg., Cleveland 13, O.

SHEET STEEL REPRESENTATIVE CHICAGO AND VICINITY

Old established steel warehouse handling Sheet and Strip Steel, Coils, Prime—Secondary Products. Excellent opportunity. Experience essential. Address Box 273, 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.

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 286, STEEL, Penton 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.

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.

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SALARIED POSITIONS $2,500-$25,000, POSTwar plans are creating lifetime opportunities now. This thoroughly organized confidential service of 35 years' recognized standing and reputation carries on preliminary negotiations for supervisory, technical and executive positions of the calibre indicated, through a procedure individualized to each client's requirements. Several weeks are required to negotiate and each individual must finance the cost of his own campaign. Retaining fee protected by refund provision. Identity covered and present position protected. Plan now for postwar security. Send only name and address for details. R. W. BIXBY, INC., 110 Delward Bldg., Buffalo 2, N. Y.

Positions Wanted

PLANT OR WORKS MANAGER. FIFTE years experience in all phases of design, develo ment, production, methods, incentives, toolin layout, etc. gained as product, tool and machi designer, production manager, superintendent small mechanical mechanisms, clocks, engine magnetos, miscellaneous wire and pressed me manufacturing. High in initiative, ingenui imagination. Capable of managing and expan ing medium sized plant. Only interested in po tion with reputable concern offering comple responsibility for all plant operations. Sala $12,000 required plus opportunity for bonu exceptional profits produced. Age thirty-fi married ,two children. Available Feb. 1, 194 Write Box 292, STEEL, Penton Bldg., Cle land 13, O.

SALES ENGINEER WITH TEN YEARS E perience in sales, engineering and manufactu of wire and wire specialties desires new conne tion. Particularly experienced on alloy wire sp cialties. Metallurgical engineering graduate. A dress Box 283, STEEL, Penton Bldg., Cle land 13, O.

SALES ENGINEER, PITTSBURGH DISTRICT 32. Background in steel and mechanical rubb sales in Western Pennsylvania, West Virgin Eastern Ohio. Desires permanent connection wi an established manufacturer. Address Box 2 STEEL, Penton Bldg., Cleveland 13, O.

REPRESENTATIVE WELL KNOWN THROUGH out Northern Ohio and Southern Michigan, l cated in Toledo, wishes to represent a Steel Co pany. Address Box 246, STEEL, Penton Bld Cleveland 13, O.

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MANUFACTURERS' REPRESENTATIVE DEsires lines of equipment and supplies to sell metal fabricating plants, oil companies and jobbers in the Southwestern states of Texas, Oklahoma and Louisiana. 20 years successful selling this territory. Address Box 299, STEEL, Penton Bldg., Cleveland 13, O.

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FIRST CLASS BROACH LINE WANTED IN Indiana, Western Ohio or either. Address Box 290, STEEL, Penton Bldg., Cleveland 13, O.

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Patent for the Manufacture of Variator of Speed with Mechanical Movement, Without Friction nor Belt. Write to:

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rue des Tawes, 37-45 Liége (Belgium)

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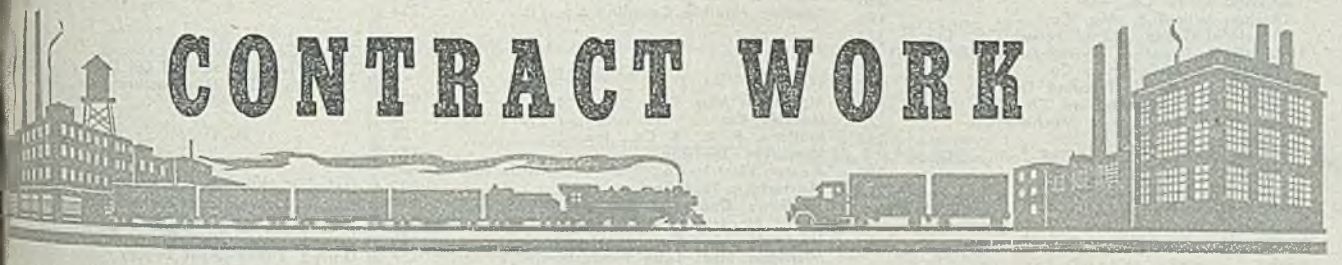

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