STEEL

The Magazine of Metalworking and Metalproducing

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NEWS

TECHNICAL

FEATURES

MARKETS

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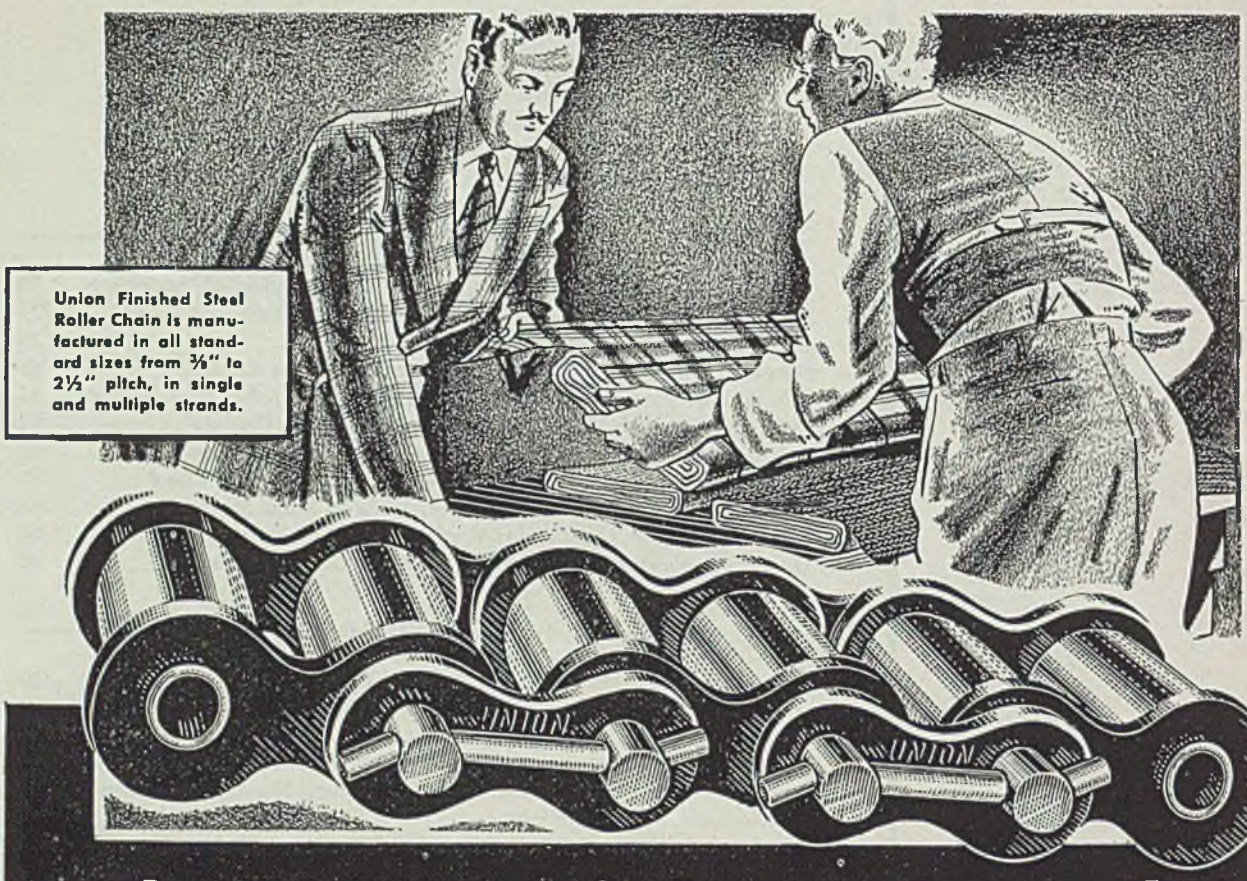
Warner & Swasey's "Cam-Less" 5-Spindle Automatic

Properties and Limitations of Grease Lubricants

Sustained High-Speed Sawing at 15,000 FPM

Three Coatings for Stainless Steel Welding Electrodes

1000-Kv X-Ray Unit Inspects Heavy Steel Sections



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ARMY ★ E ★ NAVY

UNION CHAINS

As the EDITOR VIEWS the NEWS

A Job for Congress

The time has come for members of Congress to awake to the call of duty. In their preoccupation with pressing affairs of the moment, many of them have lost sight of the precarious condition of the ship of state and of the dangerous direction in which it is drifting. The executive branch of the government has been led by incompetent advisors into a position of confusion and impotency from which it cannot extricate itself without the help of constructive action on the part of the legislative branch.

Much of the predicament in which the administration now finds itself is due to mistakes made since V-J Day. First it set out to drop all wartime controls promptly. The policy was good but the execution was bad. Next the administration moved to combat deflation, which left-wing economists declared was the immediate threat. When this fallacy was exposed, Washington shifted its forces to the inflation front. In this it labored long on the idea that wages could be increased liberally while prices remained unchanged. Later the President acknowledged this was impossible. The administration decided to withdraw from labor disputes, then the President intervened in several major controversies with disastrous results and now the White House policy again is "hands-off."

Throughout these agile moves from one extreme to the other, the administration has assumed more and more control over private affairs. Apparently its way of correcting its own mistakes is to clap on additional controls.

Right now the allegedly "new" wage-price policy commits the administration to regulations which cannot possibly be administered effectively. The housing program entails policing that cannot be handled properly except by a bureau of incredible size. Washington talks of restoring government allocation of materials, but there is no personnel in government service capable of doing this as well as industry can do it.

To properly administer the controls the White House now contemplates would require a bureaucratic army twice the size of that which functioned in wartime, when only one customer—the government—was involved.

Congress has a duty to the nation to put an end to this nonsense. It can do it in two ways:

1. Scrutinize all proposals for extending wartime powers carefully. When powers are extended, insist that controls be removed in step with the nation's progress in reconversion.

2. Institute a searching investigation of the activities of executive department agencies which go beyond the intent of Congress and take steps to stop these practices immediately.

STEEL
March 18, 1946

DOLING OUT THE STEEL: Shortages of some materials which were threatened long before wholesale labor trouble developed, have been aggravated seriously by the strikes which have ended recently. In the case of steel, the production lost through strikes will cause maladjustments which for months to come will impose new problems upon producers, distributors and consumers.

One of these problems is that of distributing steel as equitably as possible to those who want to buy it. Demands are current from various sources for the government to restore its wartime allocation of steel. In the opinion of some authorities who helped the government in distributing steel during the war, any attempt to duplicate this effort under government auspices in peacetime would be a grave mistake.

Of all the men who tackled the job of allocating steel for the government in wartime, those who functioned most efficiently were experienced steel men. These men now are in industry. Few, if any now available in Washington are experienced in this

(OVER)

work. It is questionable whether the government would be able to draft men of the right type from industry to do the job now.

Steel users almost certainly will get a better break on steel allocation from industry than they could get from a hastily recruited staff in a government agency. —pp. 81, 82

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MORE COMPLICATIONS: Chester Bowles' explanation of how the new wage-price policy will work and his 99 answers to 99 questions left most industrialists as confused as ever. The only new element of importance seems to be a more emphatic assurance by Mr. Bowles that OPA will handle hardship cases more promptly.

No doubt Mr. Bowles desires to keep this promise. However, does he know that some OPA officials make no bones about deliberately stalling on claims for relief? Has he forgotten that OPA is always making a survey of some kind that must be completed before price rulings can be issued? Has he taken into account the time-consuming potentialities in the technicalities of what is net worth and how estimated profit or loss in 1946 can be related to profit or loss in base years?

Hope for price relief in time to do any good still is vague. When the confused mess of stabilization cried aloud for simplification, Washington responded with a plan more complicated than ever. It will not work. —p. 78

° ° °

HERDED TO DISASTER: Thousands of words are being written about the futility of the recently-ended General Motors and General Electric strikes and of the losses incurred by employees, employers and the public.

There is another aspect of the strike situation that receives too little attention. It is the plight of the employers and employees of thousands of small plants now strike-bound or threatened by strike simply because they are drawn into labor disputes by the government-encouraged strategy of CIO which treats all units in a given industry—large and small and good and bad—as members of a common herd.

This indiscriminate use of the right to strike on an industry-wide basis has been responsible for great injustices. One wonders how many companies may be forced eventually to liquidate. Stockholders of 65-year old, strike-bound Milton Mfg. Co., favor liquidation. —pp. 75, 76, 81

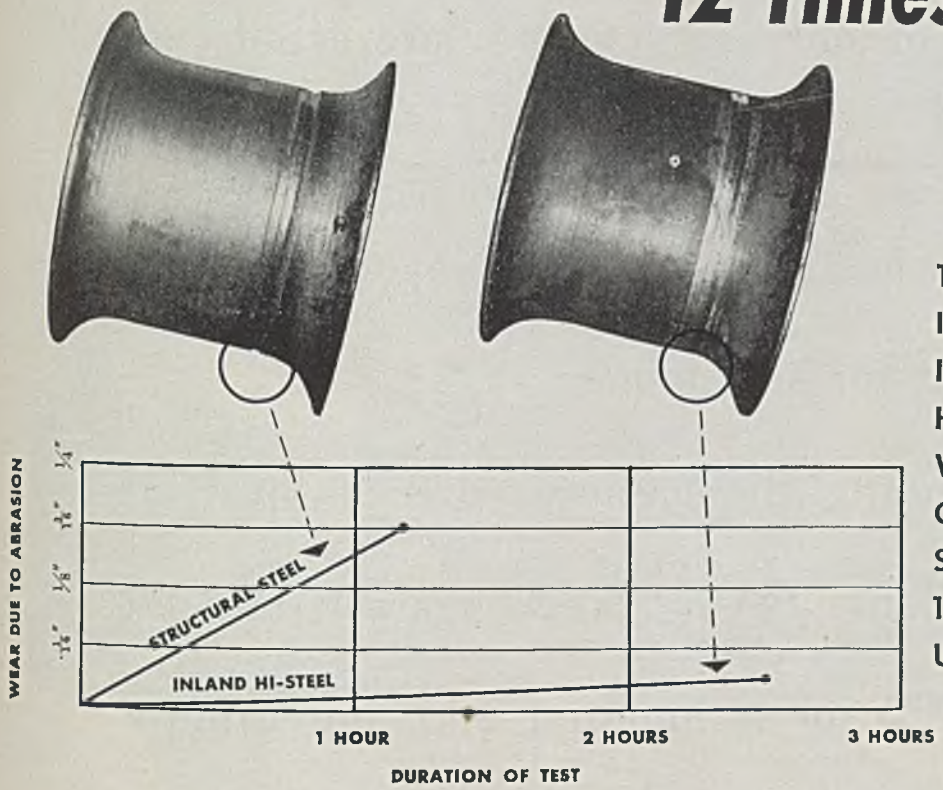
SIGNS OF THE TIMES: For a brief period around the end of May motordom will welcome a diversion from its accustomed monotony of wage and price grief. It will stage a million dollar Golden Jubilee celebration in Detroit (p. 92) in observance of the fiftieth anniversary of the beginning of the motor car manufacturing industry. The sponsors hope that pioneers such as Henry Ford, R. E. Olds, C. W. Nash, W. C. Durant, C. B. King, J. F. Duryea, Barney Oldfield, Ralph DePalma, Eddie Rickenbacker and others will participate in the festivities. . . . Prospective purchasers of surplus machine tools may avoid disappointment and save money by reading the booklet on "How To Buy Surplus Machine Tools" (p. 87), just issued by the National Machine Tool Builders' Association. It provides good advice on how to be sure you obtain the machine tool you really want in proper condition and at the right price. . . . A California company has developed a pipe crawler or "go-devil"—a Neoprene ball encased in a mesh-like harness of heavy chain (p. 124)—which can be forced through a water main or pipe line to remove scale or other deposits. . . . A substantial portion of the current budget of Bituminous Coal Research, Inc., research agency of the bituminous coal industry (p. 96), will be devoted to studies on the more efficient use of coal in heating residences—a project of interest to many manufacturers of heating appliances and equipment. . . . Because of the setbacks suffered by the automobile industry in its reconversion program, the Automobile Manufacturers' Association has canceled its option on space at Grand Central Palace in New York (p. 91), where it had planned to hold a national automobile show next fall. . . . Norman W. Foy of Republic Steel told members of the National Association of Sheet Metal Distributors at Atlantic City that marked shortages in the supply of flat-rolled steel (p. 82) are likely to continue for two years. . . At long last steel founders (p. 80) have been granted an increase in the ceiling prices of steel castings. . . . Officials of the American Standards Association are elated that Secretary of Commerce Wallace has endorsed as "eminently desirable" an ASA recommendation (p. 84) that negotiation and publication of industrial and consumer standards be entrusted to private initiative on a wholly voluntary basis. ASA hails this as a reversal of the wartime trend toward government control over standards.

E. C. Shane

EDITOR-IN-CHIEF

Resists Abrasion . . .

12 Times Longer!



Tests Show That Inland HI-STEEL,* In the Precipitation Hardened Condition, Will Outwear Ordinary Structural Steel More Than 12 Times When Used For Winch Heads

*TRADEMARK—REG. U. S. PAT. OFF.

Recent tests were undertaken by American Hoist & Derrick Co., St. Paul, Minn., to determine the comparative wearing qualities of winch heads—made of Hi-Steel in the precipitation hardened condition and of ordinary structural steel. To simulate actual field operation as closely as possible, the steel cable around the winch was held under load and the winch revolved. Both winch heads were of identical size and shape. In the first test of 70 minutes with ordinary structural steel, and in the second of 150 minutes with Hi-Steel (as indicated by the graph above), Hi-Steel's exceptionally higher resistance to abrasion was clearly demonstrated.

Along with superior resistance to wear, Hi-Steel also offers you a high strength steel—permitting considerable weight reduction while maintaining the required structural strength—as well as great resistance to fatigue, impact, and atmospheric corrosion. Since Inland Hi-Steel can be furnished in most structural sections, plates, strip and sheets, and is economical to use, its applications are many and varied.

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Write for the Inland Hi-Steel Engineering Bulletin No. 11. Inland Steel Company, 38 S. Dearborn St., Chicago 3, Ill. *Sales Offices:* Cincinnati, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul. *Principal Products:* Bars, Structurals, Plates, Sheets, Strip, Tin Plate, Floor Plate, Piling, Reinforcing Bars, Rails, Track Accessories.

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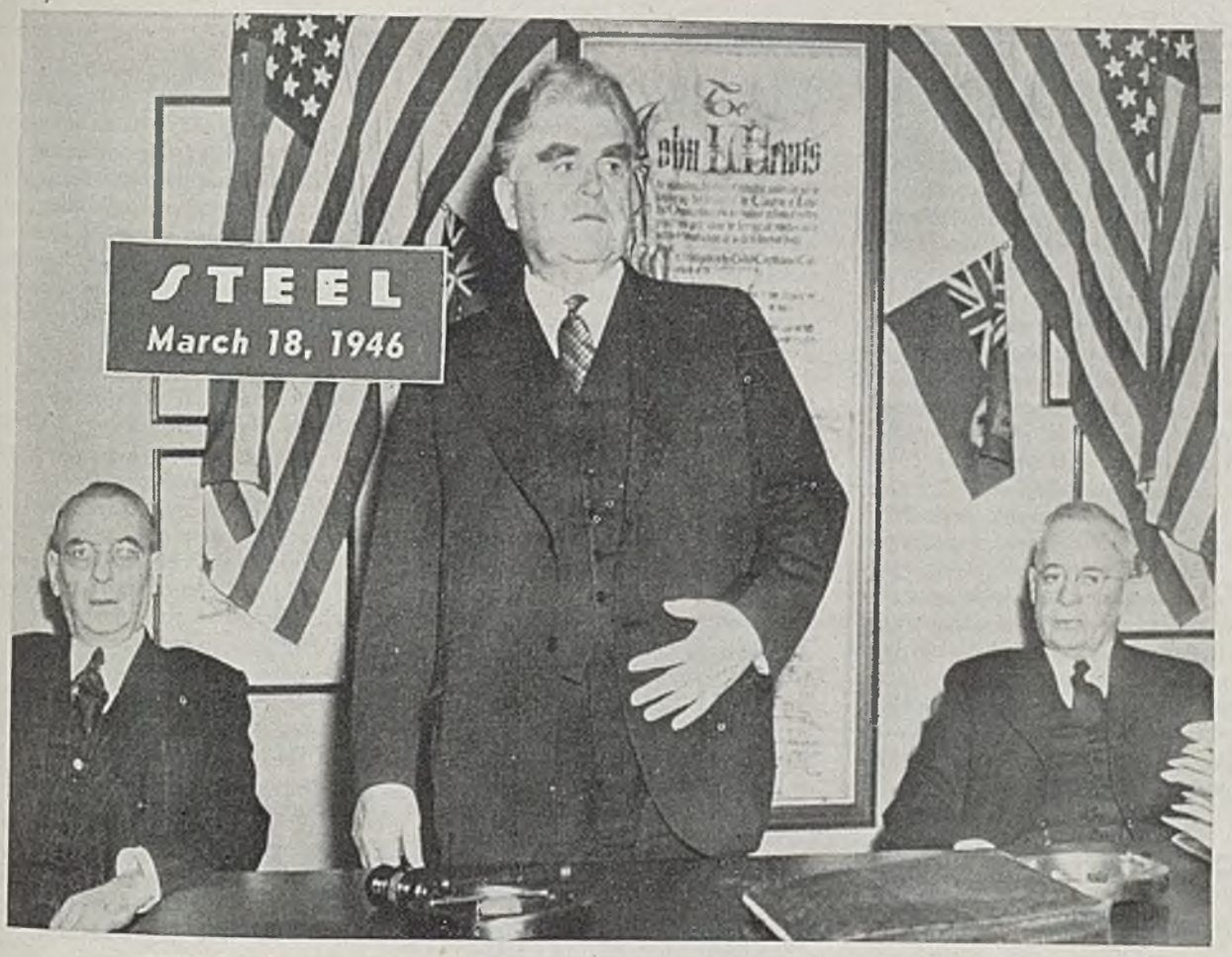


NEXT? Focal point in the national industrial relations picture currently is John L. Lewis, shown here addressing the United Mine Workers' policy committee as the mine workers' wage and other demands were formulated in Washington last week. NEA photo

GM and GE Strike Settlements Open Way for More Normal Production

Nearly half million still on strike in major metalworking plants. Possibility of soft coal walkout in April clouds outlook as miners and operators confer on wages, unionization of foremen and other demands

SETTLEMENT last week of the General Motors, General Electric and numerous lesser strikes partially clears the way for large-scale resumption of civilian goods production, badly crippled by work stoppages ever since the war ended seven months ago.

When the GM and GE workers return to their jobs, the number of strike-idle in the country will be reduced to less than a half million for the first time since early in January.

The outlook for full production, however, remains clouded. Paralyzing strikes still are in process and the possibility of a walkout by bituminous coal miners in April and of difficulties in rail transportation later in the spring lie ahead. Major stoppages continuing are those at Westinghouse Electric Corp.; International Harvester Co., Chicago; Timken Roller Bearing Co., Canton, O.; and nearly 400 steel fabricating plants employing 110,000 workers. Among the latest to sign an agreement with the United Steelworkers of America (CIO) is General Steel Castings Corp., with struck plants at Eddystone, Pa. and Granite City, Ill.

Most of the nonintegrated and semi-integrated steel companies have signed agreements similar to those of the basic producers.

Negotiations between the United Mine Workers and the soft coal mine operators are underway. Demands of the miners were revealed only in general terms and in soft tones by UMW President John L. Lewis as the conference opened. Mr. Lewis' mild manner in presenting the demands led some observers to believe the miners are in a conciliatory mood; others were suspicious that Lewis' attitude was a "delayed action fuse" and UMW demands for wage increases and for unionization of supervisory employees might be pressed to the limit.

The UMW proposals were: "That a health and welfare fund for mine workers be created; adjustment of controversy affecting supervisory technical and clerical employees; increase of wages and reduction of daily and weekly working hours affecting all classifications of inside and outside employees; adjustment

of vacation, holiday and severance compensation; improved safety and compliance with mining, compensation and occupational disease laws; adjustment of intra-district and inter-district differentials and local inequalities affecting classification and compensation; elimination of inequities and abuses of existing fining and penalty provisions of basic and collateral agreements; amendment of rules and practices to promote mutual accord, increased efficiencies and elimination of small tyrannies of management; adjustment of controversy incident to unilateral interpretation of existing agreement by operators."

Should the coal wage negotiations break down and the miners quit work, the stoppage would be almost immediately reflected in the schedules of steel mills and other metalworking plants. Coal consumers generally have not been able to build stocks to normal. In the Pittsburgh district, important steel plants have only about 10 days' supply, while stocks at utilities and other industrial plants range from 35 days to two months.

Some GM Workers To Return This Week

Resumption of large-scale production unlikely before April 1. Settlement generally follows pattern of industry

DETROIT

AFTER nearly 24 hours of continuous negotiation, interrupted only for an evening meal and occasional sandwiches, the 25 weary union and management representatives in General Motors conference stumbled from their meeting room last Wednesday afternoon while James F. Dewey, special government conciliator told scores of waiting press men an agreement had been reached. The UAW had mimeographed copies of a statement all ready the evening before and they were distributed at once, following which H. W. Anderson, GM vice president in charge of labor relations, and his staff held a press conference. In the absence of C. E. Wilson, GM president, H. H. Curtice, vice president and general manager of the Buick Division, represented the administrative staff.

Examination of terms of the settlement reveals that, as might be expected, neither side won any important concessions. Basic wage increase of 18½ cents an hour followed the national pattern, even though the union tried to maintain the correction of wage inequities at the local plant level, to be initiated by GM plant managements within 90 days after ratification of the settlement by the union, will amount to more than the 19½ cents the UAW was demanding. At the same time, practically all other union contracts in the automotive field provide for correction of wage inequities.

GM won a point in its elimination of maintenance-of-membership provisions previously in force and ordered by the War Labor Board. In place of them, however, the corporation agreed to the checkoff system of collection of union dues and other assessments. There are no stipulations in the agreement with respect to price adjustments to be made on GM cars, since this is a matter falling within the framework of the new government wage-price policy. Improved vacation pay allowances are in line with other automotive agreements. Policy on promotion and transfer of employees recognizes merit and ability first, seniority second, with an added provision that an individual may, on his own, apply to his foreman or personnel man for transfer or promotion. Basically all these proposals were in GM's offer early this month.

Proposed new contract runs for two years, with a provision that it cannot be reopened for new wage negotiations for one year. No mention is made of the incentive pay issue or for prevention of unauthorized work stoppages.

Resumption of production may be slow. First the new contract must be approved by the UAW national GM council, then adjustments of local plant demands must be made, after which ratification meetings will be held among local unions. Only then can men start to be recalled to their jobs, and this may be rather difficult because of the many readjustments made by idle employees during the 113-day work stoppage. It was indicated last week that ratification meetings in union locals might be started around March 20. Observers doubt that large scale production will get underway before April 1.

The disastrous strike dates from Nov. 21 and will go into history as the longest and most costly in automotive history. Company officials estimate it has cost 175,000 employees approximately $145 million in wages, the company $400 million in production and dealers $100 million in profits on sales.

Only logical explanation for the comparatively sudden termination of negotiations after they appeared hopelessly stalemated was a union effort to disprove the charge that political differences between Walter Reuther and R. J. Thomas were at the root of the impasse. A national UAW convention opens in Atlantic City, N. J., March 23, and union leaders were leaving Detroit late last week for strategy meetings in the East before the convention opening. If the GM strike had not been settled when it was, an agreement would have been delayed probably until after April 1. Futility of any further delay probably was growing evident to Reuther & Co., but it remains to be seen whether the GM settlement will detract from Reuther's popularity sufficiently to spoil his chances of winning the union's presidency for which he is said to be aspiring; in fact, a number of union locals have already endorsed his candidacy.

Much credit for keeping the disputants together for a long period of weeks goes to Mediator Dewey. A total of 53 joint GM-UAW meetings was held before a settlement was reached. At the windup a weary Dewey said in behalf of the U. S. government, he thanked both company and union for their patience and co-operation. For GM, the 113 days of the Reuther depression appeared at an end. In Mexico where he was resting after nervous exhaustion, GM President Wilson no doubt found the sunshine a little brighter.

GE Plants To Open Soon as Possible

Resumption of operations to vary between units following strike settlement. Union wins 18½ cent per hour increase

RESUMPTION of operations in General Electric Co.'s 45 strikebound plants following settlement of the 58-day old work stoppage is expected to be gradual over several weeks, the time required to get the plants in shape for resumption varying to considerable extent.

Agreement to end the strike of the 100,000 workers was reached between the management and the union March 13 following a conference in Miami, Fla., by Charles E. Wilson, president of GE, Philip Murray, president of the CIO and Lee Pressman, counsel for the CIO.

Following this conference a meeting of officials of the United Electrical, Radio & Machine Workers and General Electric officials was called to consider the proposals made at the Wilson conference. Agreement quickly followed subject to ratification March 16 by the union membership.

Settlement of the strike calls for an increase of 18½ cents per hour in wages. The union's original demand was for a 25 cents per hour increase.

The settlement proposal also provides

for retroactive pay to Jan. 1 on the basis of the company's original wage offer of 10 cents an hour increase to employees earning less than $1 an hour, and a 10 per cent increase to those earning more than $1 per hour.

No discrimination against any employee by the company or the union because of participation or non-participation in the strike is pledged.

The wage increase is subject to National Wage Stabilization Board approval, and it will be offered to employees of the company represented by bargaining agencies other than the electrical union. Also the company will make comparable wage adjustments for employees who are not members of a bargaining unit and who receive less than $5000 a year.

Oliver Signs Agreement With Iron Ore Miners

Oliver Iron Mining Co., subsidiary of the United States Steel Corp., has signed an agreement with the United Steelworkers-CIO providing for a wage increase of 18½ cents an hour. The agreement was the first signed by an ore mining company and the union and ends the strike by Oliver Iron miners, which started Feb. 8, several weeks after the start of the steel strike. Start of the ore miners strike was delayed by a Minnesota law requiring a 30-day cooling off period.

Half of the increase is retroactive to Jan. 1, as in the basic steel settlement.

The ore strike is expected to have little effect on 1946 ore output as it occurred when open pit operations mostly were closed down for the winter. Underground mines usually work through the cold months and a supply of ore has been stockpiled for early shipments. Should demand for ore be high this season, underground miners may be required to continue at work this summer.

Douglas Aircraft Boosts Pay in New Wage Contract

Douglas Aircraft Co. and the Long Beach (Calif.) local of the UAW-CIO have signed a new labor contract increasing wages at the Long Beach plant for most employees covered in the agreement an average of 20 cents an hour. Minimum pay for classified production workers will be 95 cents an hour compared with the previous 75 cents, and the maximum will be $1.75 compared with $1.50 previously. The new wage scale is retroactive to Feb. 1. Agreement also was reached on redescription of certain jobs and the ironing out of previous inequalities in job classifications.

Unionization of Foremen Upheld by National Labor Relations Board

RIGHTS of foremen to join and be represented by unions of production workers—one of the most controversial issues in labor-management relations in recent years—has been upheld by the National Labor Relations Board in a split decision.

The decision was handed down in a case involving Jones & Laughlin Steel Corp.'s Vesta mine and the United Clerical, Technical and Supervisory Employees, a division of District 50 of the United Mine Workers, now an affiliate of the American Federation of Labor. The case came to the board in a union petition to conduct an election on collective bargaining recognition. The board ordered an election held.

PAUL M. HERZOG

The NLRB decision reverses an earlier ruling by the board in the Maryland Drydock Co., Baltimore, case in 1943, and sharply modifies the board's ruling in the Packard Motor Car Co. in 1945 in which it was held that foremen could organize independent unions but could not join with production workers.

The decision represented a major victory for John L. Lewis who now is seeking unionization of 60,000 foremen and other supervisory employees in the bituminous coal industry.

The board's ruling, however, extends far beyond the coal industry and into nearly every industry. Almost universally, management has contended that foremen and supervisory employees are a part of management and should not be subjected to union rules and discipline.

The majority opinion, signed by Paul M. Herzog, chairman of the board, and John M. Houston, a member, held that since the National Labor Relations Act directs the board to protect the rights of employees to bargain collectively through representatives of their own choosing it would be "an abuse of discretion" to prevent supervisory employees from joining any union they wanted.

In a dissenting opinion, Gerard D. Reilly charged the majority ruling "seriously distorts" the principal objectives of the labor act and predicted it would have harmful effects on industry and labor unions unless corrected by legislative or judicial action.

The majority decision, he held, "is a clear holding that an affiliated union which has already organized the production workers of a given employer may use the processes of this act to draw into its organization the very persons hired to supervise them."

Effects of the ruling, Mr. Reilly said, will be to impair seriously the ability of operators to manage their mines while the impact on the rank and file of labor is "equally catastrophic."

Mr. Reilly noted that by joining the same union as the production workers the foremen would lose the power to maintain discipline.

Warning of a collapse of management efficiency as result of unionization of supervisors, Mr. Reilly said:

"The danger of a breakdown of management efficiency through allowing unions primarily dedicated to the welfare of the rank and file to influence the supervisors is particularly great in an industry like bituminous coal mining where the closed shop is a normal incident of employment. Under such con-

GERARD D. REILLY

(*Please turn to Page* 186)

Price Relief for Fabricators Delayed

Industry-wide surveys now being conducted as to relief needed prevents immediate granting of higher prices

CAUGHT in the squeeze between rising raw material costs and higher wages on one side and frozen ceiling prices on the other, fabricators and processors of steel last week got little encouragement from government stabilization authorities they could expect early price relief despite the flood of words on the subject which came out of Washington.

The net result of 10,000 words of detail and "clarification" on the new national wage-price policy which emanated from the Office of Economic Stabilization only added to the confusion and uncertainty which is blocking reconversion on a broad scale in the metalworking industries.

Many fabricators and processors, denied immediate relief to compensate for higher raw material costs and rising wages, are facing an indefinite period of profitless operation since they will not be permitted to increase the prices on their products until they can show financial hardship.

OPA Unable To Grant Relief Quickly

Even though Economic Stabilizer Bowles has given assurances that relief will be given where financial hardship is shown, observers point out that even should the government agency act in fullest good faith, granting of such relief would be delayed indefinitely by the studies of the industries which would be necessary. The job of investigating all claims for relief would be more than OPA could handle in a reasonable time.

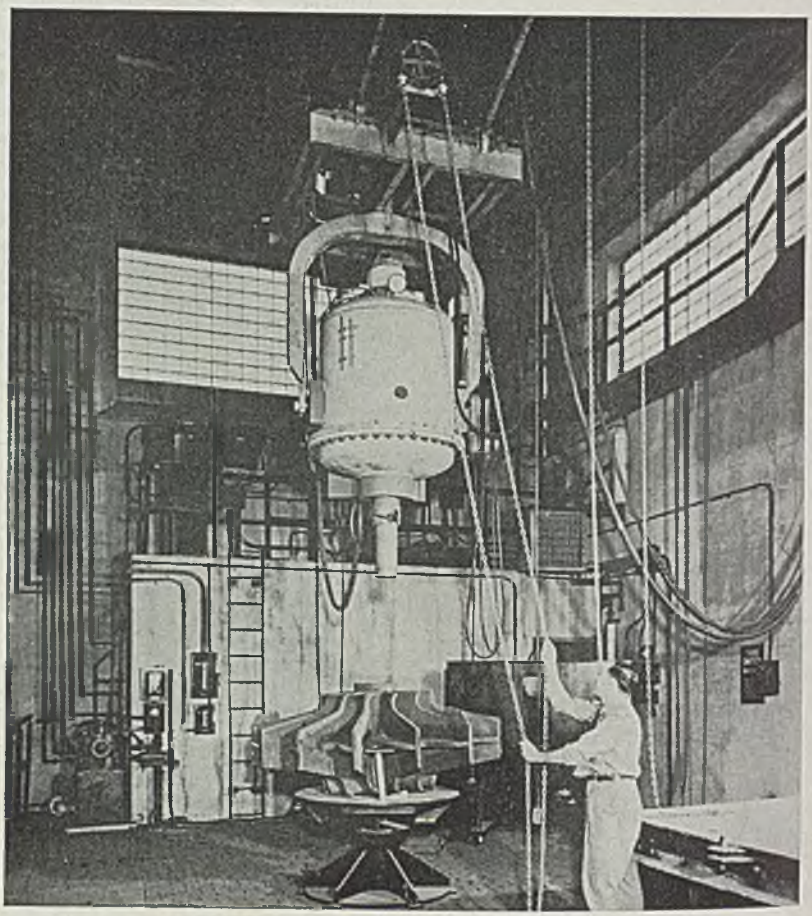
Last week Arthur H. Moran, price executive of OPA's Machinery Branch, said more than 45 industry-wide price surveys in the capital goods industries are in progress. No one knows how long it will take to complete these surveys but the guess is it will take weeks. While these surveys are under way manufacturers will not receive individual company price adjustments.

The fields in which industry-wide surveys are now being conducted by the OPA Machinery Price Branch are as follows:

Industrial power boilers; electric metallic tubing; machine tools; radio tubes; fractional hp motors; construction machinery; gears, speed reducers and sprockets; railway frogs and switches; distribution transformers; lead storage batteries; watt-hour meters; specialty transformers; air compressors; mechanical jacks; vises; pulverized coal burners and industrial stokers; car and locomotive axles; forged and steel wheels; steel conduit; forgings; farm equipment; stampings; integral hp motors; tire meters; railroad brake beams; plug fuses; wire and cable; switching equipment and cutouts; porcelain insulators; pole line hardware; industrial hand trucks, truck wheels and truck casters; mechanical power transmission; hydraulic jacks; pipe tools; steel mill rolls; coated and bonded abrasives; brewery and beverage bottling machinery; meat and poultry machinery; grain milling and cereal machinery; food canning; vegetable and fruit machinery; tobacco machinery; bakery machinery; woodworking machinery; clay working machinery.

Practically every section of the country will be adversely affected should the price position of the thousands of metalworking firms remain uncorrected for long. Many shops now are closed and more face closing over coming weeks.

Numerous fabricating plants are strike-bound by the CIO steelworker's union which seeks a wage increase in the industry comparable to that granted in basic steel—18½ cents an hour. Some of the fabricators—the exact number is not known though the union claims over 400 out of some 800—have signed with the union for the higher wage scale, electing to risk their financial resources in the hope the wage-price squeeze will be eased before they are forced to close. Most of them, however, may remain



GIANT X-RAY: A worker is shown lowering Bethlehem Steel Co.'s new million volt x-ray tube into position prior to testing a steel casting for possible defects. When the x-ray unit is in operation no one is permitted in the room and a 50-ton steel and concrete door, plus walls of monolithic concrete 24 inches thick, insure safe operation of the unit. Wide World photo

closed until their future earnings position is clarified by realistic action.

The impasse in the steel fabricating industry continues because union leaders insist fabricating plants be lumped with the basic steel industry in applying the wage increases of 18½ cents per hour granted the steelworkers. This demand is persisted in despite the fact both President Truman and Economic Stabilizer Bowles have belatedly stated the 18½ cents per hour wage boost applied only to the basic steel industry and not to the steel fabricators.

In its voluminous statement of clarification of the wage-price policy issued March 10, the Office of Economic Stabilization said the 18½ cents per hour wage increase granted in steel is not a general pattern for wage increases, that patterns will be established by the National Wage Stabilization Board on an individual basis and not by "rule of thumb," and where no patterns are apparent for industries or areas, the increase to be allowed will bring hourly wage rates to 33 per cent above 1941. In most industries use of hourly wage rates instead of average straight time hourly earnings, will permit considerably higher wage adjustments in most industries.

Pricing Policies Announced

Bowles' office also said that wage and salary increases which will be used immediately in applications for price relief must have prior approval of the NWSB if price consideration is to be given, although wage increases may be granted without prior approval if not to be used to apply for price relief for 30 days.

Other highlights of the OES statement were: An automatic pricing formula for small firms will be announced shortly. Wage rates in building and construction will be handled independently of the national policy by the Wage Adjustment Board. No price relief application will be considered in advance of approval of a wage increase. Prices, if possible, will be adjusted by industries rather than by individual firms, and industry cases will receive priority. Companies should take up their cases first through industry advisory committees to OPA. Prices will not be adjusted to cover wage increases unless a forecast of earnings indicates they will fall below 1936-1939 base period levels.

OPA pricing standard procedures will be streamlined and information will be gathered by telegraph when necessary to insure prompt action. The net worth standard in measuring profits for price-setting purposes will be a "floor," not a ceiling, on earnings.

After all the explaining and clarifying done by the stabilization authorities during the week the situation remained just as much confused as ever in the opinion of competent observers. The feeling in the metalworking industry was that there was little prospect for reconversion progress so long as the stabilization authorities continued to stick to their unrealistic policies of pricing.

Steel Industry Payroll in 1945 Double That of 1936

More than $1,645,000,000 in payrolls were distributed to iron and steel plant employees during 1945, more than double the sum paid out ten years earlier in 1936, the American Iron & Steel Institute announced last week. Total production of steel in 1945, however, was only 49 per cent greater than in 1936.

The steel industry's 1945 payrolls represented a decline from the peak war year of 1944, when $1,745,000,000 were paid out. The 1945 total was almost identical with 1943 payrolls of $1,649,000,000 despite the fact production in 1943 exceeded the 1945 total by more than nine million tons of ingots.

The number of employees in the industry again declined in 1945, continuing the down-trend which started in midyear 1942. Last year, an average of 551,200 employees was on the payrolls of the industry as against 571,200 in 1944 and 625,700 in 1943.

For the first time in the history of the industry payrolls exceeded $150 million per month in three different months (January, March and May) of 1945, the peak being set in March when a total of $154,977,000 was distributed to steel industry employees.

Salient employment statistics for December, 1945, are as follows: Average number of employees 544,900; December payroll $122,527,700; average hourly earnings of wage earners $1.22; average hours per week per wage earner 39.0.

Present, Past and Pending

■ CHRYSLER SHIPMENTS TOTAL 108,000 VEHICLES

DETROIT—Chrysler Corp. announces as of Mar. 14, it had shipped to dealers 53,000 new passenger cars and 55,000 new trucks since start of output last year. Current rate of car and truck assemblies is 2300 per day.

■ FARM EQUIPMENT OUTPUT CUT 60 PER CENT BY STRIKES

CHICAGO—Farm equipment production has been cut as much as 60 per cent by strikes, Alva W. Phelps, president, Oliver Corp., said last week. This reduction in output reflects both strikes within the industry and curtailments caused by strikes in other industries supplying basic raw materials and component parts.

■ NEW TYPE OF COIL SPRING DEVELOPED IN GERMANY

WASHINGTON—A new type of coil spring, of potential value for engine valves, has been found in a German technical steel institute. The Germans claim this spring, using 20 per cent less material than a solid wire spring of the same rate, has a 20 per cent greater fatigue life.

■ PRESSED STEEL CAR TO BUY CAR BUILDING FACILITIES

PITTSBURGH—Pressed Steel Car Co. Inc. has completed arrangements for the purchase of the car building assets of Mt. Vernon Car Mfg. Co., a subsidiary of H. K. Porter Co. Inc.

■ CONTROLS OVER BITUMINOUS COAL SALES TO BE REVISED

WASHINGTON—Regulation governing domestic distribution of bituminous coal will be lifted April 1, Solid Fuels Administration announced last week. Regulations controlling coal for export will remain in force.

■ BEARING MAKERS INDICTED ON PRICE FIXING CHARGE

CLEVELAND—Arraignment of nine defendants (six ball bearing producing companies and three individuals), indicted by a federal grand jury here on a charge of conspiring to violate the Sherman antitrust law to fix prices on ball bearings, has been set for April 8.

■ CPA LIFTS CONTROLS ON USE, ALLOCATION OF CORUNDUM

WASHINGTON—All controls on allocation and use of corundum have been removed by the Civilian Production Administration.

■ CANADIAN STEEL PRODUCERS APPLY FOR PRICE INCREASES

OTTAWA—Steel Co. of Canada, Algoma Steel Corp. and Dominion Steel & Coal Corp. have applied to the Wartime Prices & Trade Board to increase prices. Canadian steel interests face union demands for higher wages up to 30 per cent for Ontario mills and 40 per cent for Nova Scotia mills.

Selective Production and Quota Selling of Steel Seen Continued

Higher prices not expected to change producers' policy. Increased output of some items indicated. Nonintegrated mills still face difficulty in obtaining semifinished despite price increase on latter. Further price adjustments anticipated

STEEL producers are expected to continue their policy of quota selling and selective production under new price ceilings, with emphasis on production of most profitable items and careful avoidance of shipping into areas requiring abnormal freight absorption.

Production of some items, such as merchant wire products and galvanized sheets, likely will be increased.

New steel prices allow for modest increases in semifinished steel ($2 per gross ton in sheet bars; $3 on billets, slabs, tube rounds except forging quality, and skelp) with advances of $4.50 per net ton on hot and cold-rolled sheets, $7 on galvanized sheets, $7 on hot-rolled strip 6-inches and narrower and $5 on wider than 6-inches. However, there has been no rush back into production of nonintegrated sheet mills as result of the new price differentials. Producers of sheet bars and other semifinished items still are faced with deficit operations on the new price basis.

Cold-rollers have been adversely affected under new price differentials. They point out that hot-rolled strip has been increased $5 and $7 a ton depending on the width, while cold-rolled strip prices are up only $5.

Tin plate producers continue to invoice can manufacturers at prices in effect prior to recent 25 cents per base box advance. Sellers are under contract for all of 1946 shipments to can companies at the old price basis; similarly can manufacturers are committed on cost of containers to packers. However, tin plate producers are preparing new price lists on basis of recent advances granted by OPA; and on all contract commitments covering 1947 shipments, the higher tin plate prices are expected to be applied.

Now that scrap-producing manufacturers have to pay anywhere from $4.50 to $12 a ton more for finished steel, increased pressure for higher scrap ceilings is developing.

Warehouse steel interests are expected to seek additional price relief. Latest amendment permitting higher warehouse prices represented only the recent advances in mill base prices. No consideration was given to increased wage rates.

Contrary to previous OPA announcement that all alloy steel products, except stainless, are to be advanced by 4 per cent of the base price plus extras, it is now reported that an "across-the-board" increase of $5 will be granted.

Steel Casting, Railroad Specialty Ceiling Prices Raised 4 Per Cent

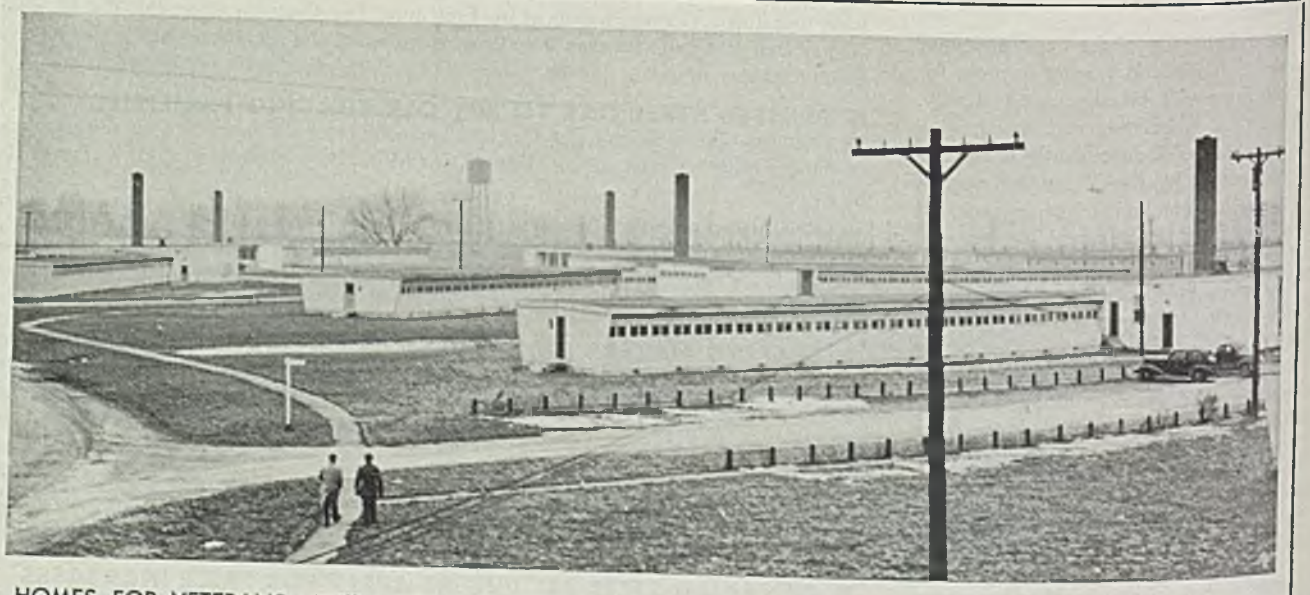
STEEL casting and railroad specialty manufacturers were granted a 4 per cent increase in ceiling prices, effective March 12. This action was taken by the Office of Price Administration to compensate the industry for the "unabsorbable" portion of the increase in wages under the wage-price policy.

OPA said the increase for castings and railroad specialties is calculated to restore earnings for the industry as a whole for the next 12 months to the average levels prevailing in 1936-1939.

Since makers of steel castings and railroad specialties were granted an 11 per cent increase last November, the latest price action brings prices 15½ per cent above levels prevailing before V-J Day.

OPA announced recently a new procedure under which producers of malleable iron castings who increase their wages may apply to the agency and receive an adjustment in ceiling prices within a week, provided a price adjustment is found necessary.

The price agency explained that it



HOMES FOR VETERANS: Willow Village at Ann Arbor, Mich., where the University of Michigan has been granted space to house 1000 war veteran students is shown above. Large building is known as West Lodge and will house male veterans only. Eleven dormitories will be available to student veterans with families. NEA photo

cannot consider a general price adjustment with respect to a given industry until approved wage action has been taken by the major portion of that industry. A recent survey reveals that an insufficient number of foundries have concluded wage settlements to meet this requirement in the case of the malleable iron industry.

Where a seller of malleable iron castings has granted a wage increase since Aug. 18, 1945, that has been either pre-approved or post-approved by the Wage Stabilization Board and seeks an increase in his maximum prices on the basis of such wage increase, he may file an application for adjustment under provisions of maximum price regulation 241.

Government May Place Curb On Commercial Construction

Commercial construction will be curbed by a government order to be issued soon as a means of channeling materials and labor into the building of houses, it was reported last week.

The order, it was said, will hold up thousands of nonessential factories and business buildings now on blueprints and will require persons seeking to erect amusement facilities to show they are needed. Officials who revealed these details said the order will be "drastic and far-reaching." They added that more than $50 million a week in labor and materials are going into nonresidential building.

Housing Administrator Wilson Wyatt says construction of some factories will be permitted if they furnish needed employment or if they produce essential goods.

Mr. Wyatt said price increases in the current building program will be held to cases where it is believed they actually will achieve increased production and where they will not be inflationary or put the price of the resulting homes beyond the means of the veterans for whom they are primarily intended.

Strikebound Plant Owners Favor Liquidation

Stockholders of the Milton Mfg. Co., Milton, Pa., last week voted substantially in favor of liquidation of the company which was founded in 1880. It has been a manufacturer of bolts and nuts and also a producer of simple shapes and bars from steel obtained from outside sources.

The Milton plant employed 610, of which total 510 are members of the CIO union. The plant has been strikebound since Feb. 21 with the strikers seeking a wage increase of 18½ cents per hour.

Allocation of Steel Inventories in Strikebound Plants Asked by Auto Union

DETROIT

United Automobile Workers-CIO, through its president, R. J. Thomas, is asking for allocation of steel supplies to users.

In a telegram to President Truman March 8, Thomas charged "usually large quantities" of steel were being "hoarded" by General Motors plants.

He further charged that "the responsibility, at least in part, for this disgraceful and unsound condition arises from the loose and vague inventory control established by CPA and its policy of allowing steel companies themselves to determine who may or may not get steel."

Simple remedy, he said, was just a "survey and proper allocation of immense accumulated inventories in strikebound plants."

Tipoff as to whose axe he was grinding came in the sentence: "The experience of Kaiser-Frazer in their inability to obtain steel points up a necessity for immediate drastic action to remedy a situation which may become a national scandal.

In this connection it is pointed out that Kaiser-Frazer already has a sufficient supply of steel to build 30,000 Frazer cars, with none even near the assembly stage as yet.

Steel Production Cut Sharply by Strike

THE RECENT steel strike was reflected in a sharp drop in steel output in both January and February, according to a report released last week by the American Iron & Steel Institute, New York.

In December, the most recent month unaffected by the industry-wide strike, production was 6,058,799 ingot tons. In comparison, output in January dropped to 3,869,076 tons due to the strike which started on Jan. 21, and in February it dropped still farther to 1,353,674 tons. The latter figure was the lowest monthly output since March, 1933.

During December the industry operated at an average of 74.8 per cent of capacity, which compares with operating rates of 49.6 per cent in January and 19.2 per cent in February.

Steel production averaged 1,370,769 tons per week in December, dropping to 873,381 tons per week in January and to 338,418 tons per week during Feburary.

The following table gives details:

STEEL INGOT PRODUCTION STATISTICS

Based on reports by companies which in 1944 made 97.9% of the open hearth, 100% of the bessemer and 86.7% of the electric ingot and steel for castings production

	Estimated Production—All Companies								Calculated weekly production all companies Net tons	Number of weeks in mo.
	—Open Hearth—		—Bessemer—		—Electric—		—Total—			
	Net tons	Per cent of capac.	Net tons	Per cent of capac.	Net tons	Per cent of capac.	Net tons	Per cent of capac.		
1946										
Jan.	3,530,050	51.1	207,512	47.4	131,514	28.1	3,869,076	49.6	873,381	4.43
Feb.	1,265,561	20.3	25,905	6.6	62,208	14.7	1,353,674	19.2	338,418	4.00
1945										
Jan.	6,468,815	90.5	379,062	76.0	358,346	77.3	7,206,223	88.8	1,626,687	4.43
Feb.	5,967,842	92.4	347,227	77.1	339,520	81.1	6,654,589	90.8	1,663,647	4.00
Mar.	6,927,377	96.9	398,351	79.8	382,237	82.4	7,707,965	95.0	1,739,917	4.43
1st qtr.	19,364,034	93.3	1,124,640	77.6	1,080,103	80.2	21,568,777	91.6	1,677,199	12.86
Apr.	6,541,097	94.4	372,952	77.2	377,877	81.4	7,291,926	92.8	1,699,750	4.29
May	6,663,577	93.2	402,100	80.6	386,075	83.3	7,451,752	91.8	1,682,111	4.43
June	6,129,266	88.5	379,807	78.6	333,217	74.2	6,842,290	87.1	1,594,939	4.29
2nd qtr.	19,333,940	92.1	1,154,859	78.8	1,097,169	80.6	21,585,968	90.6	1,659,183	13.01
1st hlf.	38,697,974	92.7	2,279,499	78.2	2,177,272	80.4	43,154,745	91.1	1,668,139	25.87
July	6,318,463	88.6	381,832	76.7	286,713	61.9	6,987,008	86.3	1,580,771	4.42
Aug.	5,171,925	72.3	347,088	69.5	217,363	46.9	5,736,376	70.7	1,294,893	4.43
Sept.	5,435,358	78.7	352,847	73.2	195,156	43.5	5,983,361	76.3	1,397,982	4.28
3rd qtr.	16,925,746	79.9	1,081,767	73.1	699,232	50.9	18,706,745	77.8	1,424,733	13.13
9 mos.	55,623,720	88.3	3,361,266	76.5	2,876,504	70.4	61,861,490	86.6	1,586,192	39.00
Oct.	5,146,370	72.0	242,122	48.5	209,290	45.1	5,597,782	69.0	1,263,608	4.43
Nov.	5,640,850	81.5	358,664	74.2	201,866	44.9	6,201,380	78.9	1,445,543	4.29
Dec.	5,522,829	77.4	343,266	68.9	192,704	41.7	6,058,799	74.8	1,370,789	4.42
4th qtr.	16,310,049	76.9	944,052	63.8	603,860	43.9	17,857,961	74.2	1,359,053	13.14
Last hlf.	33,235,795	78.4	2,025,819	68.5	1,303,092	47.4	36,564,706	76.0	1,391,881	26.27
Total	71,933,769	85.5	4,305,318	73.3	3,480,364	63.7	79,719,451	83.5	1,528,950	52.14

For 1945 percentages are calculated on weekly capacities of 1,614,338 net tons of open hearth, 112,658 tons of bessemer and 104,640 tons of electric ingots and steel for castings, total 1,831,636 tons; based on annual capacities as of Jan. 1, 1945 as follows: Open hearth 84,171,500 net tons, bessemer 5,874,000 tons, electric 5,455,890 tons.

For 1946 percentages are calculated on weekly capacities of 1,558,041 net tons open hearth, 98,849 net tons bessemer and 105,491 net tons electric ingots and steel for castings, total 1,762,381 net tons; based on annual capacities as of Jan. 1, 1946, as follows: Open hearth 81,236,250 net tons, bessemer 5,154,000 net tons, electric 5,500,290 net tons, total 91,890,540 net tons.

Sheet Distributors Told Early Easing in Steel Supply Unlikely

Speaker at Atlantic City convention says scarcity in flat-rolled products expected to continue for next two years. Warns against further government controls. A. M. Vorys elected president of association

WHILE predicting that flat-rolled steel is going to continue in very tight supply for next two years, Norman W. Foy, general manager of sales, Republic Steel Corp., Cleveland, in Atlantic City last week warned that establishment of further controls on production and distribution of steel would lead to disastrous results.

"The government," he declared, "does not now have the personnel to handle such a problem intelligently, nor can it draft them from private industry now that the war is over."

Meanwhile, he believed, the steel industry is allocating its output on a fair and impartial basis and is better equipped to do so than any government agency.

Speaking before the convention of the National Association of Sheet Metal Distributors, Mr. Foy pointed out that actually light flat-rolled steel capacity is and will be for several years to come slightly less than before the war. While continuous mills provided steadily increasing capacity during the 15 years preceding war, their very magnitude, he explained, prevents any rapid expansion in rolling facilities at present. Such a mill, with supplementary equipment, represents an investment of $20 to $35 million, depending upon size, and requires a minimum of two years to build, the speaker asserted.

Decline of Hand Mills Cited

Loss of hand mill production is seriously felt, he said. As recently as 1935 there were 594 hand mills in operation. Today, he declared, 199 are still listed as active, "but many of them have not operated for some time and may never resume, and quite a few others, as you know, have suspended operations quite recently due to inability to secure sheet bar, which under OPA ceilings show steel producers substantial loss."

Many consumers, he declared, point out they never used grades and finishes produced by hand mills. However, Mr. Foy said, they overlook the fact that a large tonnage produced for galvanizing by hand mills now comes from continuous mills in the form of cold-rolled sheets.

Another serious drawback is lack of ingot capacity. Despite the increase of 15,000,000 tons during war, there is at present this limitation in various cases.

Speaking of his own company's position, he said: "Demand for every type of steel product, bars, pipe, wire, is just as pressing as demand for sheets. Rarely in normal times do all branches of the steel business operate at capacity and our blast furnace, open-hearth and other melting capacity is more than adequate. Today real limitation on our operations is the amount of steel we can melt."

"There is no quick relief from this condition," he said, "and steel users will be obliged to adjust their schedules to availability of their major raw material.

"There can't be any seven million car automobile years in the immediate future . . . .The same thing goes for other steel-consuming industries."

A. M. Vorys, Vorys Bros. Inc., Columbus, O., was elected president of the association, succeeding Bruce Haines, E. E. Souther Iron Co., St. Louis. O. F. Murphy, Lyon Conklin & Co. Inc., Baltimore, and John F. Speck, Tiffin Art Metal Co., Tiffin, O., were named vice presidents. George A. Fernley was re-elected advisory secretary-treasurer and Thomas A. Fernley Jr., secretary-treasurer.

Newly elected to the executive committee were A. B. Lewis, Palmer-Donovan Mfg. Co., Columbus, O.; Lee J. Haines, E. E. Souther Iron Co., St. Louis, both to 1943-1946 class, and Ray P. Farrington, W. F. Potts Son & Co. Inc., Philadelphia, and William A. Vernier, Superior Safety Furnace Pipe Co., Detroit, 1945-1948 class.

Members met in general session for the first time since the meeting in Atlantic City in the fall of 1944, and also gathered jointly with the National Wholesale Hardware Association, of which their association is an affiliate, the American Hardware Manufacturers Association, and the Southern Hardware Jobbers Association, the entire program running from Mar. 11 through Mar. 14, with sessions at Marlborough-Blenheim.

In addition to Mr. Foy, speakers at the metal distributors' meeting included John Serbell, manager, Aluminum Roofing Division, Reynolds Metals Co. Inc., Louisville, Ky., who discussed latest steps of his company in the roofing field; C. A. Petters, Johns-Manville Sales Corp., New York, who commented on the acute housing situation, charging "unrealistic" policies of OPA are interfering greatly with development of construction work; and E. L. Wyman, head, Warehouse and Surplus Material Section, Metals Price Branch, OPA, Washington.

Explaining the recent increase in prices allowed warehouses, Mr. Wyman told the distributors that in the case of heavy steel products resold by warehousemen under the so-called zoning systems, the amount of increases in the applicable basing point base prices permitted producers by amendment 15 to

Calendar of Meetings . . .

Mar. 18-21, National Warm Air Heating & Air Conditioning Association: Forced Warm Air Conference, Michigan State College, East Lansing, Mich. George Boeddener, 145 Public Square, Cleveland, is managing director.

Mar. 19-20, Great Lakes Regional Advisory Board: Meeting, Hotel Carter, Cleveland. Association headquarters are at A5, M. C. Terminal, Detroit.

Mar. 20-22, Chicago Technical Societies Council: Production Show, Stevens Hotel. Paul A. Jenkins, 53 W. Jackson Blvd., Chicago 4, is executive secretary.

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

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

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

Mar. 28-30, American Public Relations Association: First national convention, Statler Hotel, Washington. Richard B. Hall, 1427 I St. N. W., Washington, is general convention chairman.

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

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

Revised Price Schedule No. 6 may be added.

In the case of merchant wire products the mill carload basing point base price may be increased by the amount permitted producers; the ceiling price is then calculated in the usual manner provided for in the schedule.

In the case of secondary products, the increase granted mills may not be added after the distributor's price is calculated. The calculation is made on the increased mill base price.

In the case of pipe or oil country tubular goods, the applicable freight basing card discounts or basing point prices may be increased by the amount granted producers; the maximum price is then calculated in the usual manner as provided for in the schedule.

In the case of tool steel, the maximum prices established in paragraph (j) of Revised Price Schedule No. 49 may be increased by the amount of the applicable increase granted producers.

As to the mill price changes, he said, some of them will be classed by distributors familiar with steel pricing as unique.

"The methods by which mill prices have been increased are most important to distributors because generally the exact amount of these increases may be passed on by distributors," he said.

Pricing Procedure on Pipe Changed

"Mill prices on wrought iron pipe and Toncan iron pipe are not calculated in the same manner as has always been customary. To the price now arrived at by list and discount the mills may now increase their previously established applicable maximum prices (base price plus extras) by 8.2 per cent.

"Maximum prices on all alloy steel products except stainless and not including alloy tubing may now be calculated by mills as follows:

"The applicable maximum prices (base price plus extras) formerly established by the schedule may be increased by 4 per cent.

"On all carbon and alloy steel tubing (other than oil country tubular goods and carbon steel pipe), the previously established maximum base prices may be increased on hot finished products by 6.6 per cent; on cold finished products by 9.9 per cent. Previously established applicable extras which were calculated as a percentage of the base price may not now be marked up but any extras which were not calculated as a percentage of the base price may now be marked up 8.2 per cent.

"The maximum base prices and extras

(*Please turn to Page* 188)

Refrigeration Equipment Leader Says Government Is Bottleneck

CHICAGO

THE SAME government which broke many bottlenecks in war production has itself become the country's one and only bottleneck in getting the goods people need to live in peace, H. F. Spoehrer, vice president, Sporlan Valve Co., St. Louis, and newly-elected president, Refrigeration Equipment Manufacturers Association, said last week calling on Congress and Washington agencies to take immediate steps permitting his industry "to get materials and go about its business."

Mr. Spoehrer declared the mechanical refrigeration and air conditioning industry has two to three times its prewar productive capacity but is free to turn out only a small part of its prewar volume.

"Our industry is back to the bottleneck," he said. "Today, however, there is only one bottleneck—the government. Lack of materials and strikes, the one practically synonymous with the other, stem from delays in enacting proper labor relations measures. Production and distribution are hampered by delays in getting relief from price controls.

Mr. Spoehrer's statement followed a series of meetings and conferences of manufacturers and wholesalers in the mechanical refrigeration and air conditioning industry at which steps to assure an uninterrupted flow of parts and equipment, even when the industry attains full capacity, were completed.

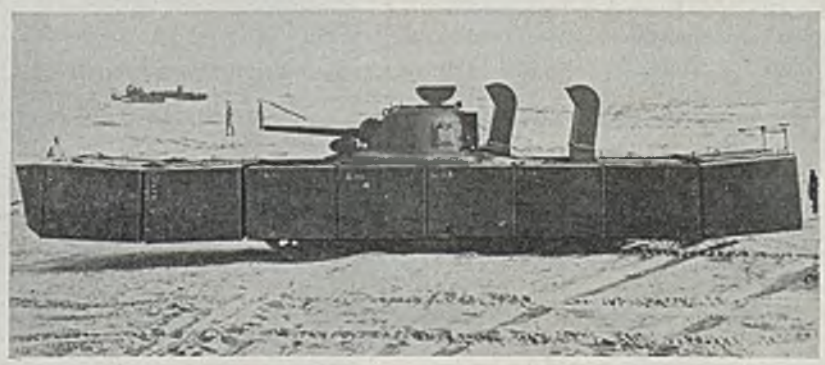
An expanded co-operative program to utilize the industry's maximum productive capacity was adopted at the spring conference of the Refrigeration Equipment Manufacturers Association and the Refrigeration Equipment Wholesalers Association held in this city.

Chicago Open-Hearth Men Discuss Shop Problems

Chicago section, National Open Hearth Steel Committee, American Institute of Mining & Metallurgical Engineers, holding its forty-third regular meeting at the Del Prado Hotel, Chicago, March 11, established a new attendance record with a registration exceeding 240.

A. P. Miller, general superintendent, Inland Steel Co., East Chicago, Ind., chairman of the section, and newly elected chairman of the national committee, presided. Co-chairman was E. L. Ramsey, superintendent of the steel and blooming mill departments, Wisconsin Steel Division, International Harvester Co., South Chicago, Ill., and newly elected vice chairman, national committee.

The single technical session featured presentation of two papers — "Labor Saving Devices in the Open Hearth," by B. D. McCarthy, superintendent of open hearths, Republic Steel Corp., Youngstown, O.; "Fully Rammed versus Partly Rammed versus Completely Burned Bottoms," by Dr. R. B. Snow, Research Laboratory, United States Steel Corp., Kearny, N. J.; and a panel discussion of "Open Hearth and Rolling Mill Practices for Production of Quality Semikilled Steels."



LIFEBELTS FOR TANKS: Tanks equipped with lifebelts of steel pontoons filled with rubber sponge were used in the later stages of the Pacific war. The device permitted a 30-ton tank to be launched at sea and "swim" ashore at 5½ miles per hour, with guns blazing. Ashore, a member of the crew touched a button inside the tank and the rivets holding the pontoons to the tank were blasted loose, freeing the vehicle of its sea-going girdle. NEA photo

Return of Standards Determination To Private Enterprise Favored

Secretary of Commerce Wallace approves initiation, development and publication by private groups. American Standards Association hails attitude as reversing wartime trend. Will expand activities to meet new responsibilities

NEGOTIATION and publication of industrial and consumer standards through private initiative and on a wholly voluntary basis has been endorsed as "eminently desirable" by Secretary of Commerce Henry Wallace.

Mr. Wallace's attitude, expressed in a letter to C. E. Wilson, president of General Electric Co. and chairman of the policy committee of the American Standards Association, is hailed by the ASA as reversing a wartime trend toward government control over standards.

Bulk of the responsibility for promulgating standards under the new policy will fall on the ASA, and the association is expanding its organization to meet its larger task. Howard Coonley, chairman of a newly formed executive committee of the ASA, has resigned his position as chairman of Walworth Co., New York, to devote practically full time to the standards job.

The Department of Commerce, Mr. Wallace said, "will be delighted to see the American Standards Association and other organizations pursue a vigorous program in the field of trade standards and will co-operate to the fullest extent in providing both scientific and technical, and economic and marketing data which will be useful in such a program."

Favors Move from Standards Bureau

Mr. Wallace favored a recommendation by the committee that the Divisions of Simplified Trade Practices and Commercial Standards be transferred out of the Bureau of Standards and said they will be moved to the new Office of Domestic Commerce as soon as possible. The Bureau of Standards will continue to function in the field of basic research.

Mr. Wallace demurred on a second recommendation of the committee that the department withdraw from the field of initiating and publishing standards which are voluntarily agreed to by industry groups and that this function be transferred to the American Standards Association.

The committee supported its recommendation with these three considerations: 1. Private groups are best qualified to initiate and formulate voluntary standards; 2. some duplication of effort now exists between the department and the American Standards Association; 3. the voluntary standards published by the department sometimes have been misinterpreted as scientifically determined government standards or as compulsory standards.

Mr. Wallace doubted that the department could withdraw entirely from this field but suggested it perform a pilot function and assist the activity of private groups.

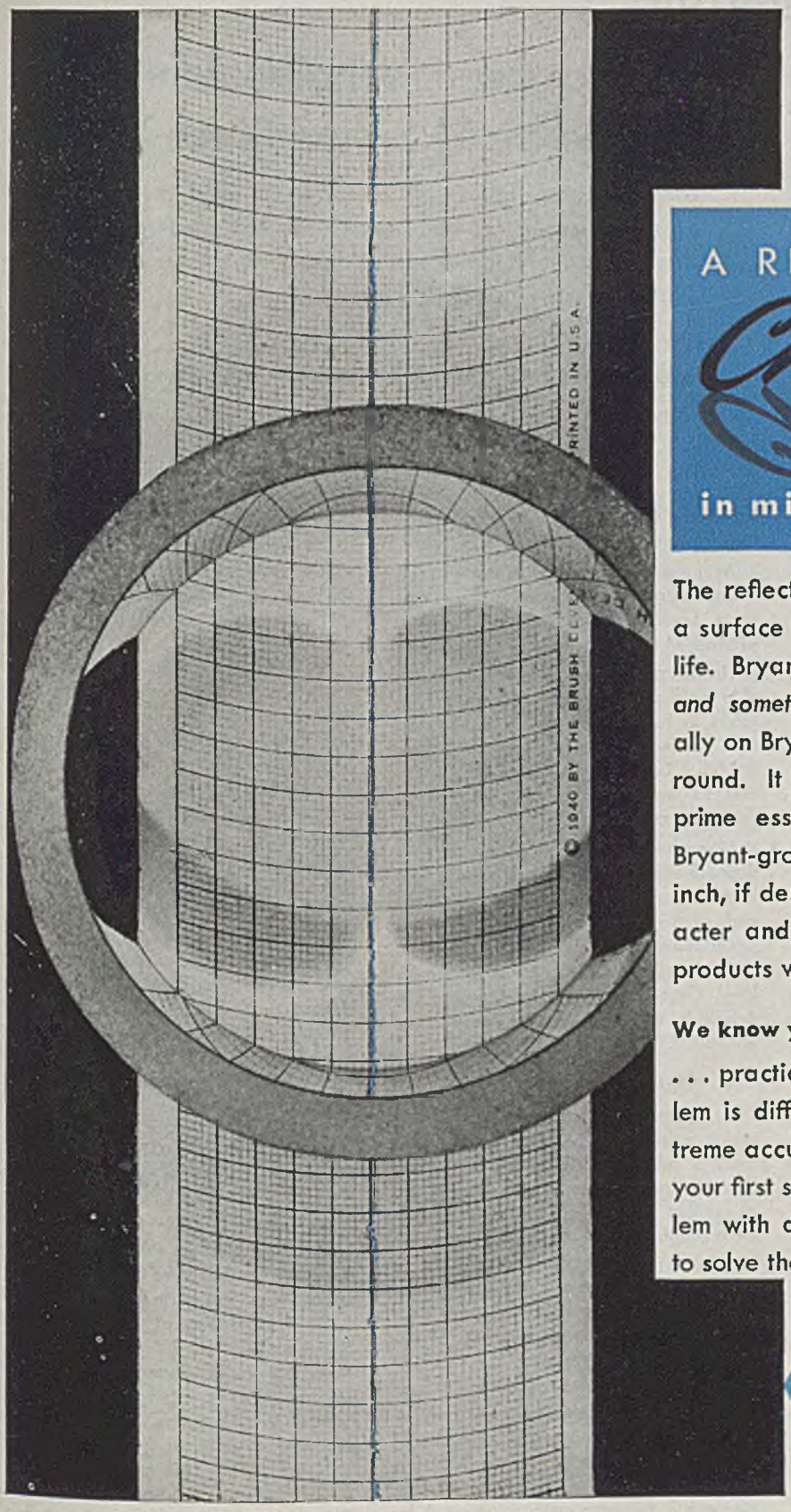
In a three-way correspondence between the department, the policy committee, and the ASA, the policy committee has given assurance that industry will make possible the necessary extensions of the facilities of the ASA to enable it to render all desired services; and the ASA has informed Secretary Wallace and the policy committee of its acceptance of the responsibility.

In a letter to Secretary Wallace, Henry B. Bryans, president of the ASA, said: "Your belief in the ability of private enterprise to demonstrate its effectiveness through voluntary action lends great significance to the responsibility which the ASA and its affiliated bodies are accepting. We have a record of successful operation in the field of industrial self-regulation. We feel that the arrangements suggested by the Department of Commerce have opened the way for a new concept in the relationship between government and industry."

Mr. Bryans announced a number of steps taken in strengthening the ASA along the lines of the policy committee's recommendations. Through a change in its constitution, the ASA has broadened the scope of its work so that it may deal with any standards or standardization project deserving national recognition whether in the field of engineering, consumer goods, or in other fields.

The representative character of the ASA board of directors is being rounded out by adding a consumer leader, a retailer, and a publisher of a national magazine. The principal consumer groups and other groups concerned are repre-

AT MONETARY CONFERENCE: Secretary of Treasury Fred Vinson, right, is greeted by Mayor Peter Rose Nugent, left, of Savannah, Ga., on his arrival to attend the International Monetary Conference. In center background is William Murphey, chairman of the committee on conference arrangements. NEA photo



A REFLECTION OF *Character*

in millionths of an inch

The reflection in the bushing, at left, shows a surface finish which assures long bearing life. Bryant Grinders assure fine work finish *and something more*—work ground internally on Bryant Grinders is also straight and round. It is the combination of these three prime essentials that gives character to Bryant-ground parts—in millionths of an inch, if desired. These essentials give character and long life to the assemblies and products which you manufacture.

We know your problem is different

. . . practically every internal grinding problem is different, but when you require extreme accuracy or high production, or *both*, your first step should be to study your problem with a man who makes it his business to solve them. Your first step should be to—

Send for the Man from Bryant!

This bushing, with hole ground in a Bryant Grinder, was checked for surface accuracy. The chart line shows deviation. Distance between vertical lines represents one-millionth of an inch.

BRYANT

BRYANT CHUCKING GRINDER CO.

SPRINGFIELD, VERMONT, U. S. A.

sented on the main ASA committee on consumer standards. Methods of work have been streamlined.

The representative character of the ASA has been broadened by membership of 13 additional national organizations in the last year, making 94 national organizations in the membership.

Plans are already under way to expand the ASA financial structure as well as broadening the incidence of support and participation in the ASA.

The three-way correspondence indicates that the growing demands for standards will find the ASA prepared to act as the clearing house for all interested groups. As in the past 28 years of continuous service the ASA will lend its technical staff and its facilities for negotiating and publishing standards, to all groups irrespective of size or field of interest. The Department of Commerce will co-operate with the association and continue to sponsor and perform basic research in the economic and marketing field for the American Standards Association and other groups engaged in the formulation of voluntary standards. It will even act as sponsor for groups proposing standards and standardization projects to the ASA.

In the correspondence, which is in essence an exchange of statements of policy, not only is the trend towards voluntary industrial self-regulation evident but also the direction it will take. The three organizations are in agreement that high standards of living for our future can only be a result of the ability of our industrial processes to create goods through mass production methods and that these methods will best evolve through the establishment of industrial standards arrived at voluntarily.

Proposes Marine Firms Be Given Air Franchises

Entrance of the U. S. Merchant Marine into the field of transoceanic air transport is provided in a bill introduced by Rep. Emanuel Celler (Dem., N. Y.). Declaring that the "Civil Aeronautics Board has set its face against unified sea-air service," Congressman Celler proposes to empower the Maritime Commission to grant international air franchises to United States marine transport firms for maintenance and operation of supplemental aviation routes overseas.

Holding that the present situation in which U. S. flag steamship lines are not permitted to fly planes is "intolerable," Representative Celler stated that "foreign merchant marine companies are supplementing their overseas routes by air transportation and they will soon crowd out our native companies."

Manufacturers', Wholesalers' Stocks Increased by $1 Billion Since V-J Day

Large inventory deficit still apparent in relation to current and prospective sales volume, Department of Commerce finds. Substantial accumulation expected during remainder of year if production of civilian goods permits

AMERICAN manufacturers and wholesalers in the first five months after V-J Day increased their inventories by a billion dollars despite the simultaneous disposal to the government or transfer to civilian use of most of an estimated $9 billion worth of "war" goods, according to the Office of Business Economics, Department of Commerce.

As a result of piling up of these stocks, manufacturers and wholesalers are now in a favorable position for the rapid production and distribution of new goods.

However, despite the generally favorable position of manufacturers and wholesalers in building up stocks in the durable goods field, it is apparent that there is still a large inventory deficit in relation to current or prospective business sales, it was said.

How much the deficit amounts to depends on whether or not the prewar inventory-sales ratio is restored. At the end of 1945, an additional $5 billion would have had to be added to inventories to restore this ratio to its prewar level. Gaged by similar relationships the deficit in trade inventories amounted to $3 billion.

Inventory Rise Expected

As a result of the inventory deficit which existed at the beginning of this year, a substantial inventory accumulation is expected this year as production of civilian goods increases. The department emphasized that demand stemming from inventory requirements is of a temporary nature, and once stocks have been built up to a volume consistent with the rate of operations this type of demand tends to disappear.

A large part of the inventories so far accumulated by manufacturers and wholesalers was required to fill "pipelines" that were emptied during the war, but the progress made by manufacturers in filling the inventory gap is attested by $1 billion rise from June to December in inventories of raw materials and finished goods, it was said.

Inventories of goods in process, where the major portion of war contract liquidation occurred, declined sharply in the same period. At the end of 1945 raw materials comprised about half of all manufacturers' stocks, goods in process one-fifth, and finished goods nearly one-third.

With the termination of the war in Europe industries primarily engaged in manufacturing nondurable products began to increase stocks of finished goods.

These inventories continued to increase at an accelerated pace during the rest of the year. In sharp contrast, the value of finished goods stocks of the durable goods industries tended downward since V-E Day.

As of Dec. 31, 1945, the department estimated the book value of all business inventories — manufacturing, wholesale and retail—at $27.3 billion, of which $16.6 billion was in the hands of manufacturers, $4.4 billion in wholesale channels and $6.3 billion on retailers' shelves.

As of July 31, 1945—just before V-J Day—the total value of inventories was estimated at $26.9 billion—$16.2 billion for manufacturers, $3.8 billion for wholesalers and $6.9 billion for retailers.

For comparative purposes, similar figures for the total value of inventories at the wartime peak, Nov. 30, 1943, were given as $28 billion total; $17.9 billion for manufacturers, $4.1 billion for wholesalers and $6 billion for retail trade.

Argentine Import Duties Increased on 300 Articles

Automatic increase in Argentine import duties on about 300 articles resulted from the termination of the Argentine-United Kingdom trade agreement of Dec. 1, 1936, according to the Office of International Trade. The increased Argentine rates of duty apply to a broad range of products exported by the United States to Argentina. The Argentine government terminated the agreement on Feb. 21, 1946. This agreement had reduced Argentina's duties on these articles. The reduced rates had been extended to imports from all countries, and consequently, with the termination of the agreement the higher pre-agreement rates have been re-established and will affect imports from the United States.

The products affected include materials, automotive products, hardware, machinery and chemicals.

Additional Names of Approved Surplus Machinery Dealers

IN ADDITION to the firms listed in previous issues of STEEL (Feb. 4, p. 101; Feb. 25, p. 67; March 11, p. 81), War Assets Corp. has licensed the following to solicit and negotiate sales of government-owned surplus machine tools and production equipment. A total of over 900 dealers have been approved to handle these disposals.

New York

Bronx: A. J. Coyle, 1321 Webster Ave.; Lyndhurst: Joseph B. Stein, 534 Kingsland Ave.; Jamestown: W. C. Cowden Mchy. Co., Wellman Bldg.; Brooklyn: Johnson Products Co., 394 Johnson Ave.

New York: Fitzgerald & Hudson Inc., 136 Liberty St.; Bronx County Mchy. Corp., 33 Howard St.; Brill Equipment Co., 225 W. 34th St.; J. W. Sinnott Associates, 32 Broadway; Compass Engineering Co., 111 Broadway; F. H. Crawford & Co. Inc., 30 Church St.; B & S Machinery Co., 19 Howard St.

North Carolina

Asheville: S. W. Harrington, Box 230.

Ohio

Warren: Hetz Construction Co., 2500 W. Market St.; Shaker Heights: A. L. Bechtel Machinery Co., Box 3962; K. E. Karlson & Son, 3435 Menlo Rd.; Euclid: Ajax Mfg. Co., 1441 Chardon Rd.; Sandusky: Erco Distributing Co., 1625 Fifth St.; Willoughby: Harry N. Harvey, 47 Cherokee Trail; Columbus: Diamond Sales & Engineering Co., 12 N. Third St.; Joseph T. Ferguson Association Inc., 1491 E. Main St.; Cleveland Heights: Adolph Friedman, 2909 Washington Blvd.; Dayton: C. H. Cosiger Machinery Co., 108 McDonough St.; Rocky River: Rickey Machinery & Supply Co., 800 Wager Rd.; Sidney: Monarch Machine Tool Co.; Hamilton: Liberty Planers Inc., 1000 Weller Ave.; Toledo: Ford Machinery Co., 206 I.O.O.F. Bldg.; Davis Machinery Co., 135 S. St. Clair St.; Commercial Processing Co., Toledo Factories Bldg.; Johnstone Machinery Co., 901 Lafayette St.; Oatis-Booth Mchy. Co., 323 Richardson Bldg.; Sandusky: Rinkleff Hardware Co., 121 W. Water St.; Mansel L. Rankin, 1741 Columbus Ave.; Steubenville: Louis Berkman Co.; Shaker Heights: Olin R. Pritchard, 3280 Warrington Rd.; Massillon: H. J. Koontz, 1180 Tremont Ave.; Cuyahoga Falls: A. C. Supply Co., 1745 Front St.; Lakewood: Harry M. Righter, 1495 Lincoln Ave.; Columbus: Osborne & Sexton Machinery Co., Fourth & Russell Sts.; Tiffin: National Machinery Co.; Dayton: Seifreat-Elstad Mchy. Co., 1006 Harries Bldg.; Lima: Harry Wright Jr., 302 Colonial Bldg.

Cincinnati: A. T. Brown Machinery Co., 407 Resor Ave.; Harold K. Hirschberg & Co., 2108 Carew Tower; Eastern Machinery Co., 1000 Tennessee Ave.; J. A. Fay & Egan Co., 1110 Alfred St.; John O. Schulte & Son, 1712 Logan St.; Cincinnati Shaper Co., Hopple, Gerrard & Elam Sts.; Cincinnati Machinery & Supply Co., 217 E. Second St.; E. A. Kinsey Co., 331 W. Fourth St.; Alfred A. Troyke, 4422 Appleton St.; Akron: William E. Crisp, 710 N. Main St.; Hall Machinery Co., 215 James St.; L. Albert & Son, 200 N. Union St.

Cleveland: Smead & Small Inc., 1630 Hanna Bldg.; Wellington & Co., 1101 Hippodrome Bldg.; Pavlin Machinery Sales, Box 1712; Kenneth C. Largent, 1949 W. 52nd St.; E. G. Johnson & Co., 404 Chester-Twelfth Bldg.; John J. Katzenmeyer, 1897 W. 74th St.; A. C. Sales & Distributing Co., 936 E. 185th St.; Weber Machinery Co., 11313 Lake Ave.; Industrial Service Inc., 4400 Euclid Ave.; George D. Miller Co., 509 Rockefeller Bldg.; Jergens Tool Specialty Co., 15957 Euclid Ave.; A. P. Cockel Machinery Co., 1817 E. 26th St.; Cleveland Automatic Mchy. Co., 2269 Ashland Rd.; Frank T. Goetz Mchy. Co., 823 N. B. C. Bldg.; National Acme Co., 170 E. 131st St.; Hess-Schenck Co., 3951 St. Clair Ave.; Whitney Machinery Co., 374 Rockefeller Bldg.; Peterson-McMahon Co., 26850 Oriole Rd.; Matt Machine & Material Co., 457 Hippodrome Annex Bldg.; M. A. Wertman Machine Co., 1310 E. 65th St.; Stanley A. Richardson, 503 Auditorium Bldg.

Oklahoma

Oklahoma City: Hart Industrial Supply Co., 409 W. California; Paul R. Braniff, 606 Braniff Bldg.; Tulsa: Hulsey Machinery & Supply Co., 319 Castle Bldg.; M. F. Hampton & Co., 505 McBirney Bldg.; Muskogee: Berry Equipment Co., 1621 E. Broadway.

Oregon

Gold Beach: Hunters Creek Electric Co.; Eugene: Carlson Hatton & Hay Inc., 94 E. Tenth Ave.; The Dalles: Mid-Columbia Supply & Equipment, E. Columbia River Highway; Portland: General Machinery Co., 122 SW First Ave.

Pennsylvania

Pittsburgh: W. K. Stamets Co., 4026 Jenkins Arcade Bldg.; Reading: Samuel R. Rosenberg, 648 S. Seventh St.; Harrisburg: General Machinery & Equipment Co., 180 S. Fifteenth St.; Allentown: Charles V. Fish, 501 Commonwealth Bldg.; Moosic: Alex Mushkin, State Highway; York: York Penn Machinery Co., 28 N. Penn St.; Scranton: Scranton Supply & Machinery Co. Inc., 634 Wyoming Ave.

Pittsburgh: Brown & Zortman Mchy. Co., 129 McKean St.; Barney Machinery Co. Inc., 537 Union Trust Bldg.; MacKintosh-Hemphill Co., 901 Bingham St.; Harris Pump & Supply Co., Brady & Sidney Sts.; McBeth Mchy. Co., 1109 Grant Bldg.; Ervin Machinery Co. Inc., 124 Blvd. of Allies; New Castle: George M. Kline; Erie: Erie Foundry Co., 1253 W. Twelfth St.; Brownsville: E. K. Pletcher, 1024 Water St.; Middlebury Center: Brown's Sales & Service Co.; Bala Cynwyd: Carlin & Co., 238 Bala Ave.

Philadelphia: Perry Equipment & Supply Co., 1515 W. Thompson St.; Marty's Machinery & Tool Co., 608 Arch St.; Carpenters Machinery Co., 213 N. Eleventh St.; Calco Machinery Co., 1420 Chestnut St.; Frank J. Lunney, Seventeenth & Cambria Sts.; M. J. Compty, 115 S. Broad St.; F. Emmett Hunt, Land Title Bldg.; Smith-Sattler Co., Ridge & Lehigh Aves.

Rhode Island

Providence: Cassiere Machinery Co., 191 Eddy St.; E. A. Eddy Machinery Co. Inc., 186 W. Exchange St.; Pawtucket: Builders Specialties Co., 258 Pine St.

Tennessee

Chattanooga: Strable-Johnson Supply Co., 1300 Broad St.; Bert L. Sylar & Son, 105 Belvoir Ave.; Memphis: Hays Machine Tool Co., 269 S. Front St.; W. C. Pitts & Son, 154 N. Front St.; Clarksville: Perkins & Miller, 412 Commerce St.; Knoxville: Deaderick Machinery Co., 608 Sevier Ave.; Chattanooga: Tennessee Valley Engineering & Equipment Corp., 2012 Wilson St.

Texas

Brownsville: Pipkin Motors Inc., 927 S. E. Elizabeth St.; Harlingen: Tri-Pak Machinery Service, Box 1228; Fort Worth: Oliver H. Van Horn Co. Inc. of Texas, 1617 Main St.; Marcuse Machinery Exchange, 2321 Prairie Ave.; Tyler: Joe Edelman Sales Co., 109 E. Erwin St.; San Antonio: Stone Machinery Co., 320 Brooklyn Ave.; R. L. Bennett & Sons, 802 Sequin St.; J. H. Wise, 701 Milam Bldg.; J. B. Love Equipment Co., 907 Broadway; Laundry Equipment Co., 226 E. Commerce St.; Procter Sales Co., Transit Tower; Waldo E. Bugbee, 1802 Alamo National Bldg.; San Antonio Machine & Supply Co., Box 660; Fred D. Hassler, 1241 Milam Bldg.; Machinery Exchange, 2211 S. Olive St.; J. E. Ingram Equipment Co., 1146 W. Laurel St.; Gates Saw & Tool Works, 1012 S. Presa St.; Russell & Butler, 742 Milam Bldg.

Corpus Christi Hardware Co., 99 S. Broadway; Cage Implement Co. Inc., 2101 Leopard St.; Brownsville: Delta Machine Co.; Dallas: Viking Supply Co., 2625 Elm St.; Texas Welding Supply Co., 1300 McKinney Ave.; Amarillo: J. Ernest Stroud & Co., 501 E. Third Ave.

Utah

Salt Lake City: Landes Machinery Co., 171 W. South Temple; Nickerson Machinery Co., 271 S. West Temple.

Virginia

Alexandria: George Z. Anders; Anthony J. Daukas, 76 Chinquapin Village; Bassett: Blue Ridge Hardware & Supply Co. Inc.; Logan: Guyan Machinery Co.; Roanoke: Moss-Golden Co., 1600 S. Jefferson St.; Richmond: Louis Miller, 3204 Hawthorne Ave.; James W. Rankin, 607 N. 34th St.; Arlington: Hugo E. Czerwonky, 4848 Little Falls Rd.; Emanuel Schugar, 1718 N. Troy St.; Norfolk: A. L. Guille, 716 Boush St.; Alexandria: Albert L. Miller, 511 Duke St.

Washington

Vancouver: Tom M. Anderson Co., 1000 W. Eighth St.; Tacoma: Gerrish Machinery Co., 1101 East E. St.; Aberdeen: Western Machinery Exchange; Yakima: Turner Bros., 113 S. Fourth Ave.; Seattle: C. Kirk Hillman Co., 3201 First Ave. S.; Spokane: General Machinery Co., E. 3500 Riverside Ave.; Crescent Machine Works, 821 N. Monroe; Washington Machinery & Supply Co., West 9 Cataldo; Union Iron Works, Box 2135.

West Virginia

Huntington: M. Cohen Co., 726 Third Ave.; Belmar Co., 221 22nd St.; Meisel-Swartz, 1501 Washington Ave.; Charles Town: Bly Distributing Co., Citizens Office Bldg.

Wisconsin

Milwaukee: General Equipment Engineering Co., 3530 W. Pierce St.; C. R. Daniels Machinery Co., 5135 N. 32nd St.; F. W. Burns Machinery Co., 1730 W. North Ave.; State Machine Tool Co., 1441 N. Third St.; Kenosha: Long Sales Co., 6207 Seventh Ave.

Milwaukee: Smythe Co., 789 N. Water St.; Madison: National Trading Co., 20 N. Carroll St.; Green Bay: Nelson Machinery Co., 119 N. Pearl St.

Tool Builders Offer Hints On Buying Surplus Machines

Suggestions to prospective purchasers of surplus machine tools are contained in a booklet, "How To Buy Surplus Machine Tools," just issued by the National Machine Tool Builders' Association, Cleveland.

The booklet outlines procedure for finding what machine tools the government has for sale, where they are located, how they are priced, how payments must be made and defines the preferences set up in the Surplus Disposal Act.

The association advises prospective buyers to "Go and look at the machine" to determine exactly what type of tool is being offered for sale and to determine what kind of condition the tool is in at the present time. Details concerning machines offered by the War Assets Corp. may not always be accurate or complete.

Surplus sales and information offices throughout the United States are listed in the booklet as well as a formula for determining prices.

Southern States Seek To Extend Industrial Gains Made During War

Agriculture increasingly shares spotlight with industry in South. Some observers think prospects for diversified southern manufacturing are so bright as to warrant installation of additional steelmaking capacity

AGRICULTURE, pre-eminent in the economy of the South since earliest days, is increasingly sharing the spotlight with industry in that region. What is happening is the culmination of a development program instituted 20 years ago by far-seeing southern businessmen who realized better balance between agriculture and industry was indispensable to the economic stability of the area.

For many years progress towards the goal was slow, though steady. Then came the war and with it industrial expansion on a scale undreamed of but a few years before. Not only were old plants enlarged and new ones erected, but industries virtually new to the area were established, providing a diversification of production by which the South contributed mightily to the war effort. Today, southern interests are striving with all effort not only to hold the industrial gains achieved during the war but also to move on to still greater heights.

Steel, centered in the Birmingham-Gadsden districts, while a major contributor to southern industry, present and prospective, is not alone as a source for expanding payrolls in the South. The eyes of a great many students of the South's future are on aluminum. Alabama has come rapidly to the front in aluminum production as a result of the Reynolds Metals Co. development at Lister Hill and the Aluminum Co. of America project at Mobile.

Some observers think prospects for diversified southern manufacturing now are so bright as to warrant installation of additional steelmaking capacity. A great many factors that did not exist before the war in the South need to be considered now, it is said. There is the postwar construction and expansion need for steel, and the part the district can play in the general rehabilitation program; there is the retention of shipbuilding in the South; there are the small diversified industries crying for steel; there is the determination to further diversify, and there is a broad, comprehensive research program to which money, in substantial amount, has been subscribed and which should serve to attract new industries to the area.

Not in many years has anything captured the fancy and imagination of the South in a degree comparable to the work of the Southern Research Institute. Hardly out of swaddling clothes, the institute is a going concern, housed in its own quarters in Birmingham, planning an early start on a new building, and with 20-odd men and women of the sciences on the job under local and national auspices.

Its prime objective is to find new uses for southern raw materials, and it is exploring the entire field including steel, lumber, textiles, ceramics, and many others.

Three essential ingredients of steel are found within a stone's throw of each other virtually at the doors of the southern steel mills. Southern ore is not as rich in iron as is that of the fields of Minnesota, but there is an abundance of it, and coking coal is available nearby. Many observers feel industry is going to draw more and more upon southern mineral reserves as time passes. The Southern Association of Science & Industry is working on raw material development, and all the states of the South have become interested in research to the point of subscribing money for the cause.

Proponents of freight rate equalization hail such as one of the keys to the new industrial South in the making. Others, however, discount the value of the rate fight and results to date.

Aerial view of the Hurricane Creek, Ark., alumina plant, extreme left, recently acquired by Reynolds Metals Co. Plant is one of the world's largest, most modern and most efficient alumina plants

Machine "Lays" Concrete House in 18 Hours

LONGVIEW, TEX.

The "Tournalayer," new facility of the building industry created by the R. G. LeTourneau enterprises, Peoria, Ill., to "lay" a 24 x 30 ft. concrete house in 36 hours actually did the job in 18 hours in its first public demonstration here. At the site of the East Texas factory in which R. G. LeTourneau proposes to make the huge mass production machine for building the shell of the house, hundreds of persons saw the mobile concrete form straddle the prepared foundation, pour its cement for 5-inch thick walls and move off to the next site after the concrete had set.

The machine moves on gigantic pneumatic tired wheels. The form walls, after being freed from the concrete after it has set with the press of a button, are raised clear of the walls, ready to proceed to a new operation.

The Tournalayer itself provides only the four outer walls of a squat house and an inside wall running the entire length of the dwelling. The forms may be altered for location of windows and doors to conform with cross-partitions as desired by the individual occupant. Forms for such arrangements must be erected by hand. The time required to finish the erection depends on the extent of these variations, plumbing installations, the type of roof to be added and installation of other appurtenances.

Electric wiring conduits are embedded in the walls where needed and provision for plumbing fixtures are such that they may be immediately roughed in. Metal window frames are spotted in the forms where needed by pegging them into holes which are conveniently located all over the forms.

Metal mesh is the reinforcement material used.

The demonstration machine was shipped to Longview from the Peoria factory in six boxcars. It is the plan to make the bulk of the machine at the Longview plant, on which construction is scheduled to begin as soon as materials are available.

Mr. LeTourneau said that it was not the intention of his corporation to go into the house building business but to lease the Tournalayer equipment to contractors.

Coincident with the ground-breaking ceremonies and the Tournalayer demonstration, the deed to the old Harmon General Hospital which the LeTourneau interests obtained from the government was formally presented to Mr. LeTourneau at dedication of the structure as a technical institute, which the LeTourneau Foundation is to conduct in connection with the proposed factory.

The Tournalayer and a variety of other new products are to be manufactured at the new Texas plant of the earth-moving machinery builder, announcements of which are to be made later, Mr. LeTourneau said.

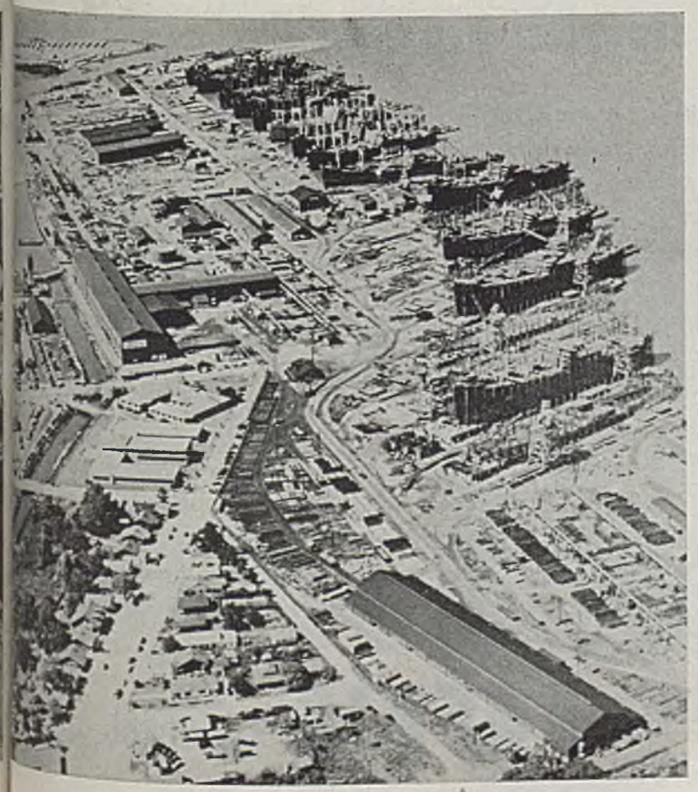
South Seen Providing Large Market for Appliances

Industrial advancement of the South within the past few years and progress of research developing wider and greater uses for agricultural products of that area have caused the Conlon Corp., Chicago, maker of household washers and ironers, to list the section as a primary market for its products, I. N. Merritt, vice president and general manager, told 200 representatives of the Interstate Electric Co. in New Orleans.

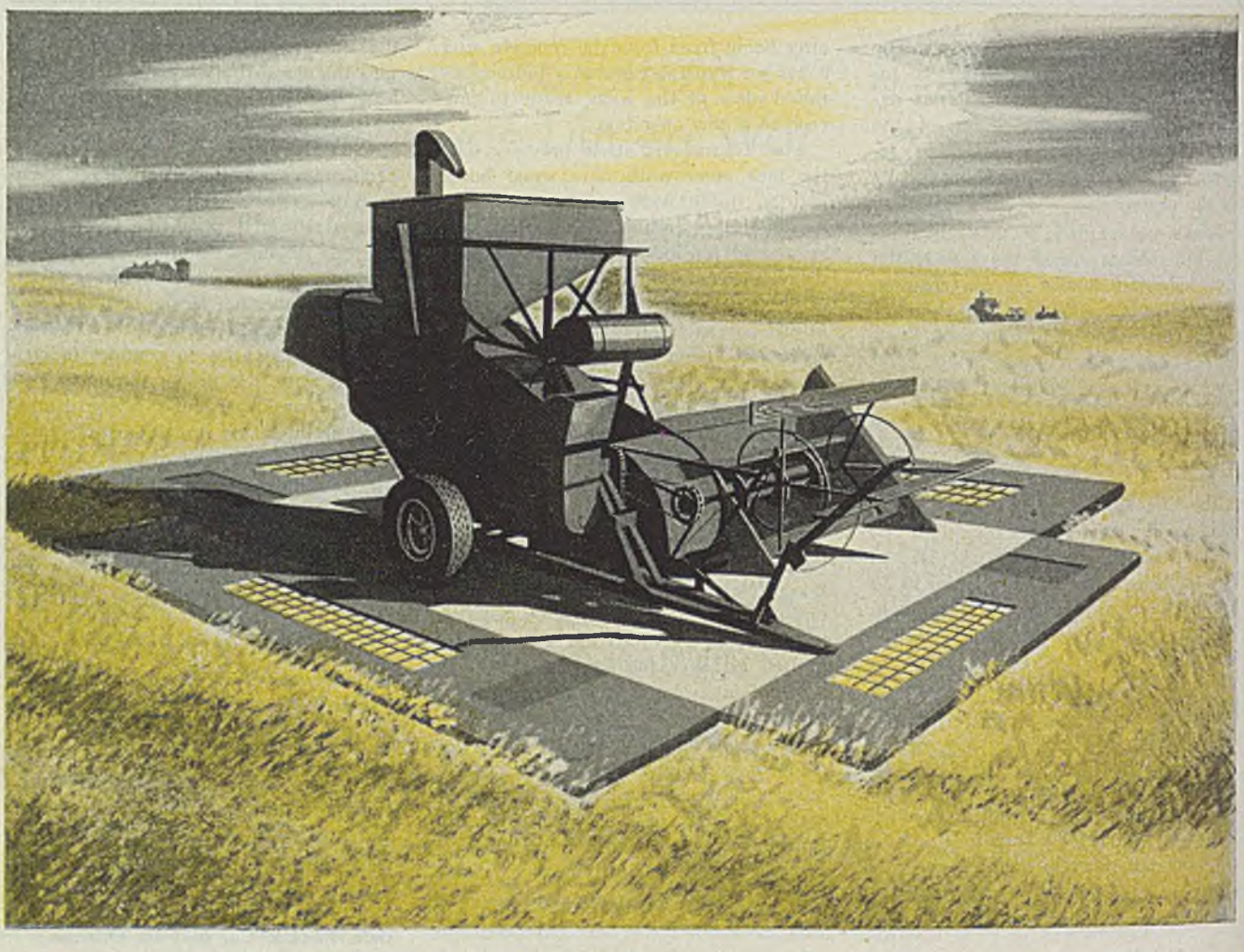
Despite materials shortages, caused by labor troubles in the plants of suppliers, and difficulties of manufacturing under present OPA regulations holding down production generally, Mr. Merritt asserted his factory is equipped and ready for output exceeding 1200 units daily as soon as a free flow of supplies can be established.

Low-Sulphur Sponge Iron Patent Made Available

A patent covering production of low-sulphur sponge iron is included in a series of government-owned patents just placed on the Department of Commerce register of patents available for license on a nonroyalty, nonexclusive basis. This is the first series of government patents to be made available, it is stated.



The sprawling Ingalls shipyard at Pascagoula, Miss., was busy on ships in all stages of construction when this view was taken recently. The yard has $100 million in peacetime ship orders



FACTORY IN THE FIELDS

TAKE away the brick walls from a manufacturing plant, throw in a dust storm and a cloudburst, shake vigorously and add a touch of frost and you've got a taste of what the maker of agricultural machinery is up against. He's working for farmers . . . and the factory is in the fields.

Machinery like that needs ball bearings to take abnormal loads and reduce friction. But that's asking ball bearings to take a lot of abuse. When a farmer's using machinery. . . that's the very time he can't stop to lubricate it. Nor can he afford any time out for shop repairs in town.

These three simple steps lock the **Wide Inner Ring Bearing** *to the shaft:*

But Fafnir has a ball bearing that can take all that. It's the wide inner ring ball bearing with exclusive self-locking collar and Mechani-Seals. The wider ring affords added shaft support. The self-locking collar enables the farmer to remove and replace, if necessary, this Fafnir Bearing with ease. And the Mechani-Seal, a labyrinth of steel plates, absolutely traps in grease and locks out dust, dirt and moisture. It's a bearing a farmer can respect. It's part of the reason American farm equipment is the world's finest.

And it's another illustration of how Fafnir works from the bearing need to the precise bearing for that need . . . of how the Fafnir line became "the most complete line in America." The Fafnir Bearing Co., New Britain, Connecticut.

MOST COMPLETE LINE IN AMERICA

FAFNIR BALL BEARINGS

mirrors of MOTORDOM

By A. H. ALLEN Detroit Editor, STEEL

New York automobile show scheduled for this fall to be canceled, indicating no industry-wide changeover to 1947 models. Million dollar Golden Jubilee of motor car industry to be held in late May will commemorate fiftieth anniversary of the $4 billion industry

DETROIT

CANCELLATION of plans for a national automobile show in New York this fall, indicated by the relinquishing of an option on space at Grand Central Palace by the Automobile Manufacturers Association, is the tipoff there will be no industry-wide changeover to 1947 models at that time. No national show has been held since 1940 and at one time it was thought the event would be resumed in gala fashion this year along about October. Credit the CIO with effecting the cancellation.

Practically all passenger car manufacturers began preliminary work on new models as early as last September and tool and die programs were released subsequently on the basis of making a quick changeover late this summer after a high-pressure run on 1946 models. Now, however, with General Motors stalled by strikes for nearly four months, with Ford production in-and-out because of the steel strike and troubles with supplies, with Chrysler's start seriously delayed by parts shortages, with Packard closed down until 30 days after the termination of the GM strike, and with other independents barely limping along, all of last year's planning must be discarded.

Future Situation Uncertain

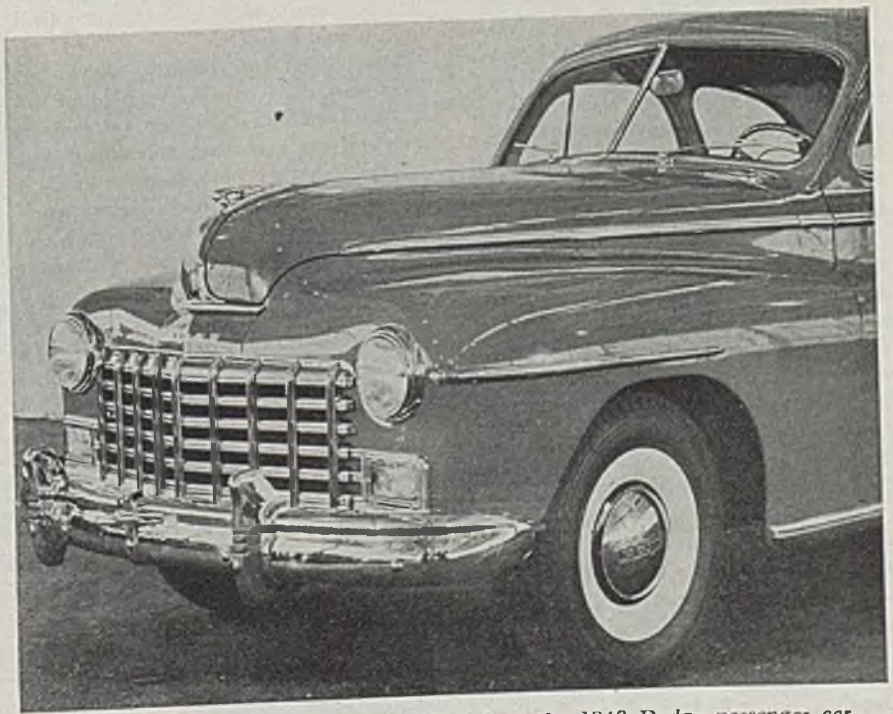
Exactly what will happen is still uncertain. Even with a settlement of current strikes, there will be difficulty moving assemblies up to projected levels because of inability of materials and parts plants to meet schedules. Steel companies, for example, say it probably will be the second quarter of 1947 before they can begin delivering sheets and strips in the volume wanted by the auto industry. If it were not for this, there might be some possibility of placing assembly schedules on a double-shift basis and compacting enough 1946 model production in the next six months to absorb the investment in tooling and the high overhead costs incident to low-level production. Present outlook rules against this procedure.

About all that can be hoped for at this juncture is to get production started throughout the industry and to run it right through the year in line with materials commitments, moving output ahead to the extent suppliers can step up their schedules. At some point, the time probably varying widely with different companies, the new stuff can be sandwiched into the old, and gradually accelerated as the 1946 programs are run out.

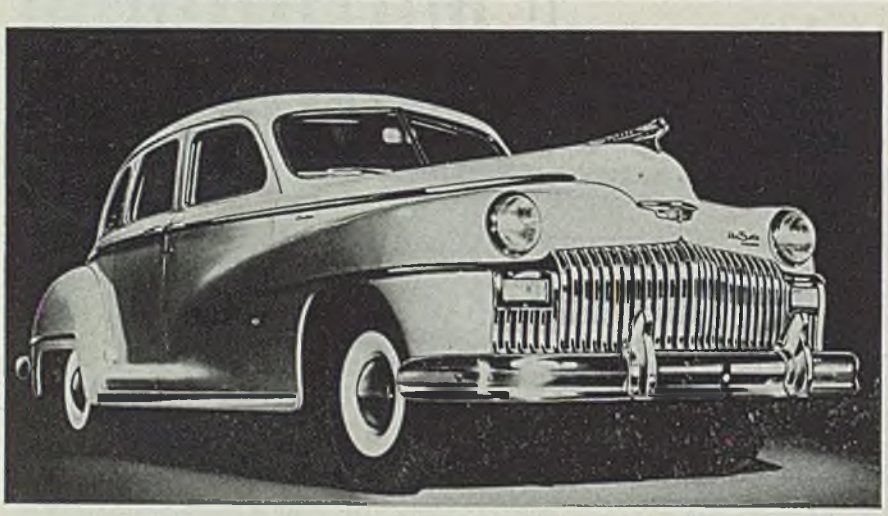
Conceivably it might be possible that yearly dates would be dropped from new passenger cars entirely until the full industry can get on an even footing. As a matter of fact, the new Dodge and DeSoto lines carry no 1946 identification, and Studebaker reportedly is about ready to bring out two new lines which are considered 1947 models. In the advertising pages, Kaiser and Frazer are calling their creations 1947 models, in the belief they may be able to steal a march on the rest of the industry, but at the pace they are progressing the cars will literally be 1947 models. One way to get around the dating problem is to refer to models by series numbers. Thus current production might be identified as series 31, with preparatory work now being completed on the series 32 and production start held tentative.

Parts suppliers who have what are called "commitments" from car builders should not count on them too strongly as a gage of what future production will actually be. These commitments are only advance guesses which can be (and actually are being) scaled back without notice. There is nothing requiring the buyer to adhere to commitments. What counts more are actual orders placed for specific quantities, although here again there is nothing mandatory, the final measure being "releases" against orders. If this seems to indicate that the buyer has the supplier at his mercy, that is really the case, as it has been in the past, except that today the buyer is more inclined to promise anything if only his supplier can meet his releases at the specified time.

From time immemorial the automobile industry has always had something over which it could work up a lather of ju-



Stainless steel forms the massive grillework of the 1946 Dodge passenger car, just announced formally. Bumpers are wider and heavier, extending back across fender skirts



New De Soto models, just announced, feature completely redesigned front ends, wrap-around bumpers and restyled interiors. New cars are longer and lower than 1942 counterparts

bilant excitement, but it has been wallowing around in the doldrums for some time now, without much to beat the drums over or toot the trumpets about. To the rescue at last has come the announcement of a $1 million Golden Jubilee celebration scheduled for Detroit around the end of May. It is dedicated to the observance of the fiftieth anniversary of the $4 billion motor manufacturing industry, grown, as its ardent spokesmen say, "From a cluster of alley shops to a world-renowned industrial enterprise, spread over 44 states and a dozen foreign countries." As one top auto executive remarked, the celebration at this time has all the earmarks of an elderly couple celebrating their golden wedding anniversary at the country poor farm, but nevertheless the event is being shaped up into a counterpart of the New Orleans Mardi Gras, with Feast Day in old Madrid thrown in for good measure.

Steering committees, working and initiating committee, financial committee and assorted specialists in touching off celebrations of this sort have been lined up and are already at work. In addition to the industry event here, a series of programs extending through the summer and fall, will be held by groups in various sections of the country as a part of the automobile's golden jubilee year.

Some of the events tentatively slated for Detroit: A cavalcade of ancient automobiles parading through the city; reception and banquet for automotive pioneers such as Henry Ford, R. E. Olds, C. W. Nash, W. C. Durant, C. B. King, J. F. Duryea, Barney Oldfield, Ralph Depalma, Eddie Rickenbacker and others; awards to other pioneers unable to be present; re-enactment of the running of the first Ford car in June, 1896; parade of floats representing industrial firms, schools, historical societies, etc.; historical pageant, with trappers, Indians, early settlers, horsecars, high bicycles, military trucks, new busses, street cars and trucks; and a festival with dancing in the streets and general hoop-la.

Rumors were being circulated of additional plans to bring a couple of aircraft carriers up the Detroit river and anchor them at the foot of Woodward avenue to serve as showrooms for new automobiles. This event probably would be staged by automobile dealers, many of whom feel some kind of enthusiasm needs to be generated over their product in connection with so elaborate a festival as the golden jubilee.

Possibility that dealers' showrooms may soon have two sets of prices on identical cars—one pre-wage-price directive and one post-wage-price-directive—is seen following announcement by OPA that Chrysler, Ford and Hudson companies would be permitted to adjust their ceiling prices upward in view of wage and salary increases just negotiated and prospective increases in materials costs on cars delivered March 11 and thereafter. No details have been supplied on the extent of the new increase, but the figure of 3 per cent has been mentioned. What happens to the other 10-15 per cent cost increases the OPA does not seem ready to explain.

That such a pricing system will be embarrassing for a time goes without saying. Companies like Packard and General Motors, which have not yet announced new prices, appear to be in a more fortunate position, even though they are unable to supply cars.

Remodeling of two service parts and stock buildings at the Ford Highland Park plant has started and will involve outlay of close to half a million dollars. In one building, the stock bin layout is being revised, incorporating a continuous conveyor system which will carry parts from bins to the boxing and labeling department and on to cages from which dealers will receive delivery. The delivery cages will be parts of a new shipping dock. A second building will be used for delivery of purchased parts and accessories to the 33 Ford branches and assembly plants in the country.

A new development in the field of automobile engine bearings, reportedly giving superior performance to the "silver" type bearing, is a steel-backed aluminum bearing. Considerably less expensive, the aluminum-steel combination may be the next major advance in bearing design in the automotive field. Trick in its manufacture is obtaining a perfect bond between the two metals. The work of the Al-Fin Corp., affiliate of Fairchild Engine & Airplane Corp., in this field might have interesting connotations, as well as might research conducted over recent years by American Rolling Mill Co.

Announcement of 1946 De Soto models, deferred for many weeks pending the sampling of dealers, reveals a line of ten—four in a deluxe series and six in a custom series, with ten colors and four two-tone combinations available. Longer and lower than its 1942 counterpart, the De Soto offers as optional equipment the new type of hydraulic semiautomatic transmission featured on the Chrysler series.

Engine improvements include a new intake manifold, sealed-unit oil filter, powdered metal type gasoline filter, redesigned spark plugs, aluminum alloy pistons and improved copper and asbestos cylinder head gasket. Starter control has been changed to the dashboard pushbutton type.

New Front End Featured

Stylewise De Soto stresses a completely new front end with die cast grille of wide chromeplated vertical bars, widely spaced headlights, 6-inch wrap-around bumpers front and rear, 15-inch wheels and restyled interiors.

Last of the Chrysler lines to be announced, the new Dodge will be built in eight body styles, three in a deluxe series, and five in a custom series. Dodge features new fenders and decorative trim, massive radiator grille of crossed stainless steel bars, improved hydraulic brakes of the type provided on other makes in the Chrysler family, more protection against rusting on sheet metal parts by spraying concealed surfaces and enlarging drain holes, brass plated aluminum pistons, roller burnishing of exhaust valve stems to reduce scuffing, and increased use of sintered powdered metal prelubricated bushings.

EVERLASTING

as the Sea itself!

Scientists have made many guesses as to how long the seas of the world will last. Some think they will last forever. There is little guessing, however, as to how long Harper non-ferrous and stainless fastenings will last . . . they will far outlast the assemblies in which they are used. Even in corrosive chemicals they will outlast common steel because . . . Harper Everlasting Fastenings are made exclusively of Brass, Copper, Naval Bronze, Silicon Bronze, Monel Metal or Stainless Steel and will not rust or corrode.

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everlasting fastenings

A stock of over 5000 different types and sizes of bolts, screws, nuts, washers and other standard items assures fast delivery of your orders. Specials are engineered and produced from raw materials on hand for speedy fabrication. Ask for our 120-page 4-color catalog for easy reference.

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$2 Million Lost by Los Angeles Workers in 47 February Strikes

Southern California sees obtaining of materials for fabrication and resale to fill vacuum of consumer needs as major problem of readjustment period. Employment 80 per cent above prewar levels

LOS ANGELES

LOSS by workers in Los Angeles of $2 million during February was caused by 47 strikes there, according to the Merchants & Manufacturers Association.

Total of workers made idle by the strikes was given as 12,471 with 213,-815 man-hours lost in February and 13,-677 idle workers losing 164,000 man-hours during January.

CIO unions called 37 strikes while nine were ordered by AFL leaders.

In an analysis issued last week the industrial department of the Los Angeles Chamber of Commerce discounted opinions that southern California faced an unusually portentious readjustment period.

On the contrary, statistics prove that the hopes of industrial leaders will be more than justified, the report stated, submitting the following summary to back its views:

Most Expansions Permanent

Wartime growths in industry are permanent in more than 80 per cent of instances.

This makes for permanent employment and populations and augments western market needs.

The great problem facing southern California today is not unique. It is general, being that of obtaining materials for fabrication and resale to fill the tremendous vacuum of consumer needs.

Although the area is experiencing difficulty in receiving an equitable share of national output because of its geographical position, this phase of the reconversion problem is not insurmountable, as shown by the vitality of business already and the anticipated resilience of scores of industries which demonstrated soundness of management in wartime.

The Security-First National Bank of Los Angeles last week released a statement through its research department which reflected the conclusions of the chamber and also called attention to new facts.

According to the bank's analysis, southern California's rate of population growth is greater than at any time in history with the exception of the boom in the early 20s. The growth is more solidly founded now than then, due to the vast acceleration in industrial advances.

The total population of 11 southern California counties now stands at about 5,500,000, the report states, with the majority of new residents settling in the Los Angeles area.

The current level of employment is nearly 80 per cent above prewar levels and far exceeds expectations. The advance takes into account a decline of 25 per cent following V-J Day.

Current unemployment, exclusive of strikes, is principally a matter of "square pegs in round holes," rather than one of nonexistent jobs. Thousands of positions remain unfilled in businesses of all kinds throughout the area.

New Mill Depot Erection Job Progressing Rapidly

SAN FRANCISCO

Without fanfare and while some strike-bound Bay Area industries were marking time, one of the speediest steel erection jobs recorded on the West Coast was taking place at Third and Mariposa Streets. Here, a 4-acre plot of ground suddenly became a beehive of activity as a seasoned crew of steel erectors from the Bethlehem Pacific Coast Steel Corp. started placing the steel columns for a new mill depot for the Bethlehem Pacific company. The entire steel framework consisting of five 86-foot wide bays, each 375 feet in length and covering about four acres was erected in 17 working days.

The 1250 tons of structural steel used in putting up the steel framing for the building had been fabricated at the Alameda Works of Bethlehem Pacific's Steel Construction Division. During these preliminary operations, the foundations had been placed to support the structural steel framing members of the building.

Laying of the 170,000 square feet of steel roofing for the building is now nearing completion. Brick masonry work on the front wall of the building is finished. The mill depot is expected to be ready for occupancy by May 1. It will be operated under the direction of W. C. Eshelman, general superintendent, Bethlehem Pacific's South San Francisco steel plant.

The methods employed for decades by steel fabricators in prefabricating and partly assembling the structural steel before actual erection are very similar to the mass production shipbuilding operations that were widely publicized during the war.

Twelve Southern California War Plants Transferred to Private Operators

LOS ANGELES

PACIFIC Aviation Inc. has signed a five-year lease on the Los Angeles facilities it operated during the war at an annual rental of $28,000, Hecter C. Haight, War Assets Corp. regional director, announces. This is the twelfth government-owned plant in southern California which has been transferred to private industry.

The plant is on a 15-acre tract at 9900 S. Lincoln Blvd. at the proposed new addition to the Los Angeles Municipal Airport. It includes a main manufacturing building and five smaller structures.

During the war, Pacific Aviation made fuel valves and hydraulic units for all types of military planes. It is now launching a line of civilian products including a new type air-hydraulic drill for boring and tapping and other small machines and parts.

In a summary of surplus plant disposals in southern California, Mr. Haight told a STEEL representative last week that some $303 million worth of manufacturing facilities built during the war in this district— 71 in southern California and 17 in Arizona—"are moving very satisfactorily."

Mr. Haight indicated that all proposals so far accepted give promise of providing sound, stable employment. Seven of the properties have been sold outright and five have been leased.

The following plants have been sold outright: Airesearch Mfg. Co., plant at Phoenix, Ariz., to Aviola Radio Corp.; Kinner Motors addition at Glendale, sold to Mitchell Camera Co.; Kaiser-Hughes Inc., Culver City, plant portion operated by Hughes Tool Co., sold to Hughes Tool Co.; Axelson Mfg. Co. plant, Los Angeles, sold to Axelson; Vard Inc., Pasadena, sold to Vard; Weber Showcase & Fixture Co. addition, Los Angeles, sold to Weber; and Compak Food Inc., Santa Ana, sold to Case Swayne Co.

Those leased are: Bohn Aluminum &

Brass Corp., Torrance, to Harvey Machine Co.; Lockheed Aircraft Corp. modification center, Van Nuys, to Aviation Maintenance Corp.; Pacific Aviation Co. Inc. (as above noted); Douglas Aircraft Co. Inc. engineering building, El Segundo, to Civil Aeronautics Administration; and portion of Army-owned Douglas Aircraft Co. Inc. plant at Long Beach, to Kaiser-Frazer Corp.

National Iron Works Acquires Barth Foundry

National Iron Works, San Diego, has acquired the Barth Foundry & Machine Co., established there in 1913. All machines and equipment as well as key personnel will be transferred to National's new plant now nearing completion in San Diego's south bay area.

Earl F. Kenner, owner of the Barth foundry, has been named superintendent of the expanded foundry installation. Mr. Kenner joined the Barth concern as partner in 1928 after 15 years with the Hercules Foundry Co., Los Angeles. He became sole owner of Barth two years ago.

Among recent activities National Iron Works has built three 53-ton steel tuna clippers and is now constructing one 70-footer and a 105-footer. Company officials have said that it will require several years to fill the demand for this type of southern California fishing craft. The ships range in cost from $50,000 to $150,000.

Steel Sheet Shortage Retarding Production of Consumer Goods

Demand for flat-rolled products in Pacific states far exceeds capacity of western mills to produce. Projected expansions will only partially solve problem. Shipments from eastern mills fall far short of needs

SAN FRANCISCO

RESUMPTION of normal production of many consumers goods items and other types of manufactured products which depend on sheet steel as the primary material is being retarded by the current shortage of that commodity on the West Coast, according to reports.

One reason for this situation, of course, is the recent steel strike which reduced supplies to a minimum. This was compounded by a shortage of material which came as a result of the rush to reconvert to peacetime output. These conditions are more or less temporary and can be expected to be relieved partially over a period of time.

However, until steel supplies reach a condition of plentifulness throughout the country, West Coast fabricators are likely to be in a painful position because of the effect of wartime economic trends. During the war the Coast's population increased tremendously, and the present market for goods is far above prewar. This rise has far outstripped the capacity of western steel mills to make sheets.

For example, western productive capacity of sheets is approximately 156,000 tons annually, while demand now is estimated at well above 700,000 tons.

Eventually, this difference will be adjusted by the addition of new rolling mill facilities, such as those Columbia Steel Co. plans at a cost of $25 million at its Pittsburg, Calif., plant. This expansion is expected to raise rolling mill capacity of steel sheets at Columbia mills on the Coast from around 150,000 tons to about 300,000. However, the new plant will not be finished until 1947.

Meantime, the difference between present capacity of 156,000 tons and demand of more than 700,000 tons a year must be made up by shipments from eastern mills.

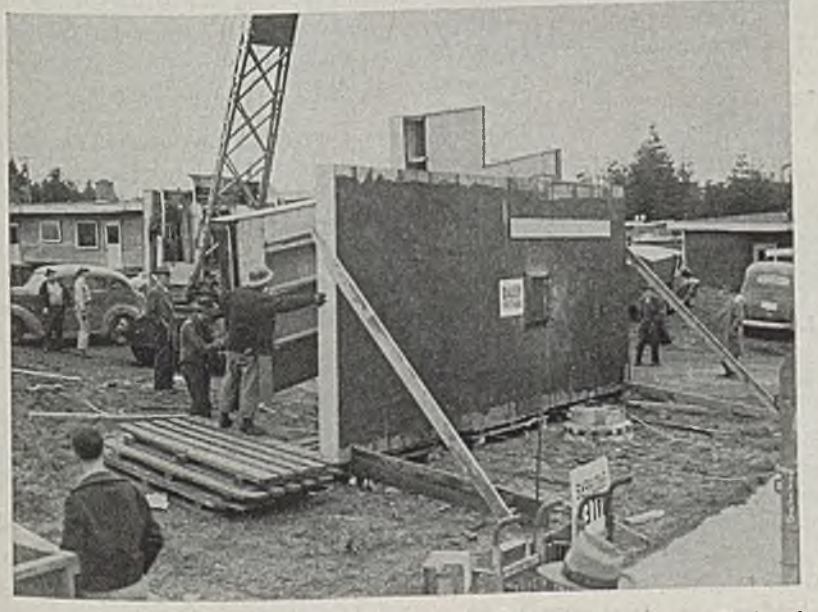
Eastern Mills Withdraw from Area

That is the rub of the present situation. Although some eastern companies are reported to be making every effort to supply the market at present, the amounts they are able to allocate to the West Coast are falling far short of the need. In addition, at least three firms are reported to have been compelled to withdraw from the Coast market because their production is not sufficient to supply oldtime customers in their home areas.

The practice in general is said to be that of allocating material only on the basis of prewar orders and declining to accept business from new customers.

Although there have been some public outcries against "eastern discrimination against the West," a number of fabricators recognize that the situation is beyond the control of primary steel producers. They are hopeful that there will be a gradual improvement in this condition, but admit that they face a critical period until such readjustment can be accomplished. It is likely that a number of newer and smaller fabricators who have not become well enough established to receive allocations may have to suspend operations.

It is also likely that the present situation may have political repercussions if sufficient pressure is brought on western congressmen.



HOUSES FOR LOS ANGELES: Federal housing project at East Port Orchard, Wash., is being dismantled and moved by truck to Los Angeles where the units will be reassembled to help alleviate that center's housing shortage. NEA photo

$401,000 To Go Into Study of Use of Coal

Bituminous Coal Research Inc. aids 40 research projects for improving utilization of solid fuels

INVESTMENT of $401,000 in more than 40 research projects to improve utilization of solid fuels by railroads, industry, and domestic consumers has been provided for in the current budget of Bituminous Coal Research Inc., Pittsburgh.

Announcing its present program, which expands and continues research begun last year, BCR, national research agency for the bituminous coal industry, reported that 240 coal companies and associations have pledged support of the work.

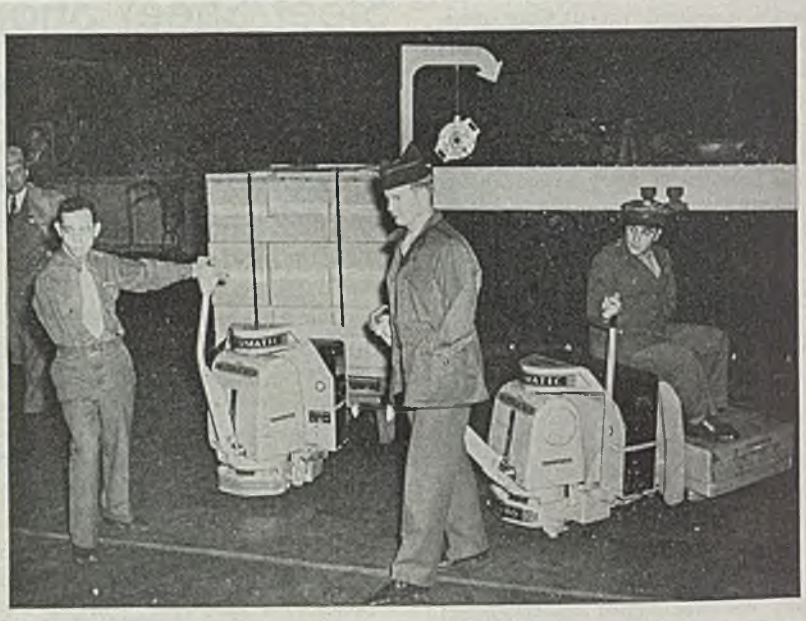
More than half of the current budget covers projects under way or to be started this year at Battelle Memorial Institute, Columbus, O. Also, BCR is a major contributor to the Coal Research Laboratory of Carnegie Institute of Technology, Pittsburgh.

Greatest share of the budget was allotted to research in residential uses of bituminous coal. For domestic projects, including a comprehensive study of improved designs for houses heated with bituminous coal, $142,750 has been set aside. Second largest appropriation was $45,500 for railroad locomotive research, and third largest was $37,000 for mining, preparation, transportation and handling of coal. The rest of the new budget has been allocated to gasification, industrial steam and nonsteam uses, and other studies.

Precision Gage Labs Set Up at Two Texas Schools

Establishment of precision gage laboratories at Southern Methodist University, Dallas, Tex., and Rice Institute, Houston, Tex., to meet the needs of expanding industry in the Southwest, has been announced by Maj. Gen. G. B. Barnes, chief of research and development, Army Ordnance Department.

Turning over of about $180,000 worth of equipment to each of the two universities' engineering departments will enable industrialists in the area to obtain more convenient check-ups on precision gages. Courses in this work will be available to the schools' engineering students.



AIDS HANDICAPPED VETERANS: A group of one-armed veterans of World War II demonstrate their ability to operate material handling equipment. These three, patients at Thomas W. England hospital, Atlantic City, N. J., are performing at the Automatic Transportation Co.'s exhibit at the national food convention in Atlantic City. Veteran at left is operating a 6000-pound capacity electric propelled hand truck. Sergeant at right operates a special 3000-pound capacity tin plate model

BRIEFS . . . .

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

Steel Conversion Corp., Las Vegas, Nev., has announced construction of a plant in Sparks, Nev., in which offices and all manufacturing activities will be located within three months. The company will manufacture a complete line of demolition tools.

—o—

A. Norman Diecks, Baltimore, has opened a metal shipping container technical consultant service at 1605-8 Court Square Bldg., Baltimore 2.

—o—

Lincoln Machine Co., Pawtucket, R. I., has moved to 235 Georgia Ave., Providence 5, R. I.

—o—

Bowser Inc., Mobile Refrigeration Division, Woodside, Long Island, N. Y., has moved its factory and general offices to Terryville, Conn.

—o—

Ohler Mfg. Co., Baltimore, has moved its machine shop from 2902 Hamilton Ave. to 8031 Pulaski Highway, that city.

—o—

Westinghouse Electric Co., Pittsburgh, has developed a 1000-watt tubular mercury vapor arc lamp for general commercial use which is said to be the most brilliant lamp yet developed for this purpose. The bulb produces light equivalent to that of 125 incandescent bulbs of 40-watt size.

—o—

B. F. Goodrich Chemical Co., Cleveland, has opened sales offices in the French Bldg., New York, and in the Field Bldg., Chicago.

—o—

Klubertanz Bros. Co., Milwaukee, has changed its name to Holming Co. and will continue sheet metal fabrication, specializing in dust control systems.

—o—

Monroe Auto Equipment Co., Monroe, Mich., has boosted production of its line of hydraulic easy-ride tractor seats to meet increased demand.

—o—

Ideal Commutator Dresser Co., Sycamore, Ill., has changed its name to Ideal Industries Inc.

—o—

Metal & Thermit Corp., New York, has appointed the following distributors to handle its line of welding electrodes: Hill Equipment Engineering Co., St.

Louis; Mid-County Supply Co., Stephenson, Mich.; Johnson Service & Supply, Little Falls, Minn.; J. T. Shelton & Son, Odessa, Tex.; Welding & Industrial Products Ltd., Honolulu, T. H.; and Jose Cestero Jr., Puerto Rico.

—o—

Baum Boulevard Division, Blaw-Knox Co., Pittsburgh, has been renamed Chemical Plants Division.

—o—

American Zinc Institute, New York, has canceled its anticipated convention in St. Louis in April because of continued congestion of hotel and railroad accommodations.

Columbia Aircraft Ceases Operations, Is Liquidated

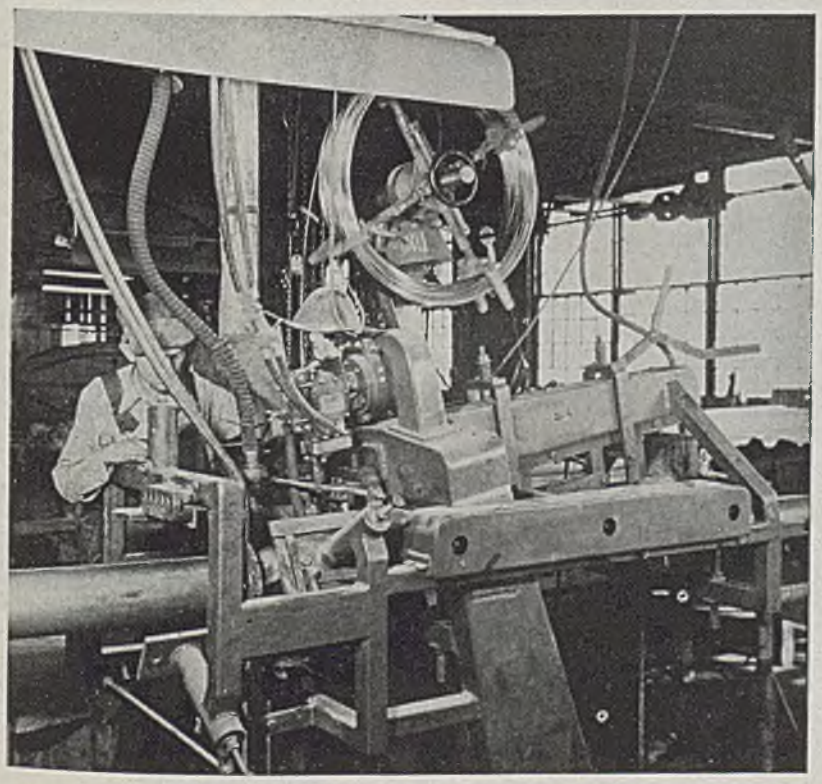
Columbia Aircraft Industries Inc., Portland, Oreg., has been liquidated after producing $20 million worth of war materials in five years, according to J. S. J. Hlobil, former president and principal stockholder.

The company began operations in September, 1940, producing bomb shackles and other aircraft assemblies, and at the peak of production employed more than 2200 men and women and trained more than 4000. During its five years of operations the company outgrew its original plant, moved into larger quarters, and took over a warehouse which it converted into a factory. Its final contract was completed some time ago, but disposal of its tools, machinery and materials has only recently been accomplished.

Mr. Hlobil, a World War I flier, has been engaged in aircraft research and designing for the past year and will go to Los Angeles this month to continue this work.

General Electric Adds 3 Engineering Divisions

In order to obtain more comprehensive industrial application engineering coverage, three new divisions have been added to General Electric Co.'s industrial engineering divisions, according to J. D. Wright, manager of the divisions. They are: Power Electronics, Materials Handling & Testing Equipment, and Rubber & Printing. L. W. Morton will head the electronics division; M. A. deFerranti, the handling and testing division; and C. W. Knapp, the rubber and printing division.



WELDING PIPE: Unionmelt welding installation here is producing welded pipe. The automatic welding head, mounted on a continuous tube mill, is shown welding 12-gage steel pipe at a speed of 70 inches a minute. The rolled sheet forms are fed into one end of the mill and come out cleanly welded and ready for painting

American Brake Shoe Enlarges Its Facilities

$12½ million program to include seven new plants, five of which are foundries. New product announced

AN IMPROVEMENT and expansion program of $12½ million in addition to expenditures of $3,200,000 on plant and equipment in 1945 has been announced by American Brake Shoe Co., New York.

Five of the seven new plants are foundries—a brake shoe plant, one for special iron castings, one producing alloy steel, and two nonferrous foundries. There will be a new nonmetallic processing plant in the United States, and one in Canada. A laboratory for research in automotive and industrial friction materials is under construction. Enlargement of the company's air compressor plant is also reported.

Shortages of material and labor are delaying new plant construction, according to William B. Given Jr., president of the company.

Mr. Given reported a new product, an electrically actuated controller designed to prevent railroad wheel sliding and resulting flat wheels under heavy braking conditions. This device has been adapted to use on certain types of locomotives to prevent wheel slipping when starting and pulling heavy loads.

Net earnings of American Brake Shoe in 1945 were $2,512,969, compared with $2,717,175 in 1944.

Reliance Spring Adopts New Profit Sharing Plan

Widely known in the spring manufacturing business, Reliance Spring & Wire Forms Co., Cleveland, recently announced a program retroactive to the first of the year to increase production and provide employees with greater incentive.

Under the plan the company will distribute among its employees the total annual operating profit over and above 6 per cent on sales, after deductions for taxes, employee pensions and insurance previously in effect. These bonus payments will be governed by ordinary earnings of the workers and by length of service.

MEN of industry

Cleve W. Ritz has been placed in charge of a warehouse recently opened in Dayton, O., by Edgar T. Ward's Sons Co. Mr. Ritz, manager in central Ohio and eastern Indiana for the affiliated companies, Columbia Steel & Shafting Co., Summerill Tubing Co., as well as for Edgar T. Ward's Sons Co., has been connected with the companies for 17 years.

—o—

Wayne R. Spahr has been appointed advertising manager, Jessop Steel Co., Washington, Pa. He has been associated with the company for the past 11 years, and continues as editor of *The Top Notcher*, published by Jessop Steel.

—o—

C. J. Whipple, for the past 20 years president, Hibbard, Spencer, Bartlett & Co., Chicago, has been elected chairman to succeed Frank Hibbard, who takes over the newly created position, chairman of the executive committee. F. B. Kaufman, formerly vice president, succeeds Mr. Whipple as president. O. W. Ahl, comptroller, becomes secretary, succeeding R. V. Trusdell, retired. F. H. Warren, vice president, also has retired.

—o—

William F. Newton has been appointed manager of research and development, Columbia Chemical Division, Pittsburgh Plate Glass Co. J. Calvin Lee has returned as that division's representative in the Cincinnati area following service as captain with the Army.

—o—

George R. Wernisch, recently discharged as lieutenant commander from the Navy, has been appointed assistant manager, Concrete Engineering Division, Ceco Steel Products Corp., and will make his headquarters at the company's plant in Chicago.

—o—

Thomas J. Cain Jr. has been appointed director of safety for all Akron plants, B. F. Goodrich Co.

—o—

H. B. Donley, general manager, Columbus Metal Products Inc., Columbus, O., has been elected president for 1946, Safety Equipment Manufacturers Association.

—o—

Vaughn W. Volk has been named manager of the Philadelphia territory for *New Equipment Digest*, succeeding W. T. McCall, who has resigned because of ill health. Mr. Volk has been connected with Penton Publishing Co. for 10 years and since 1943 he had served as advertising representative of STEEL in the Chicago area.

—o—

Richard W. Millar, Los Angeles, has been elected vice chairman, Northrop Aircraft Inc., Hawthorne, Calif. John Wescott Myers, formerly manager of airplane sales, was named vice president in charge of sales, and A. C. Morgan, contract administrator, was promoted to assistant secretary.

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William B. Bauzenberger has been appointed manager of sales, Apex Alkali Products Co., Philadelphia. He has represented the company in eastern Pennsylvania, Delaware and Maryland.

—o—

Philip L. Coddington, acting manager of sales, Welded Alloy Tube Division, Kenilworth, N. J., Carpenter Steel Co., succeeds the late Alvin K. Smalley.

—o—

Harry E. Smith, Manhattan Division, Passaic, N. J., a vice president, Raybestos-Manhattan Inc., has been placed in charge of the corporation's rubber product sales and marketing.

—o—

James C. Tweedell, export manager of the York Corp., York, Pa., since 1935, has been placed in charge of that company's International Division. S. L. Cordis is assistant to Mr. Tweedell and C. E. Renninger is sales manager. Headquarters of the division are in New York.

—o—

J. F. Tholl, for the past 15 years general manager, has been elected president, American Tool & Machine Co., Hyde Park, Mass. Mr. Tholl succeeds C. I. Day who becomes chairman of the board.

—o—

W. McKean White Jr., Elkhart, Ind., has returned from active duty with the Army Air Forces, to his position as vice president, White Mfg. Co., Elkhart, Ind. As vice president, Mr. White will be active in engineering and production problems as assistant to his father, W. McK. White, president.

—o—

J. A. Zurn Mfg. Co., Erie, Pa., announces the following: John P. Tansey, district representative in charge of the Pittsburgh office; Earl Morris, district representative in charge of the Los Angeles office; Thomas A. Kennedy, regional engineer for the New York factory office; Harold Bergman, district representative in charge of the Cleveland office, and J. Howard Butcher, district representative in charge of the Philadelphia office.

DANIEL WOLFRED

—o—

Daniel Wolfred has been appointed works manager for the Aireon Mfg. Corp., Kansas City, Kans. Mr. Wolfred has been associated with the company since 1944. Arthur E. DesNoyers has been named the company's director of procurement, continuing also as chief purchasing agent.

—o—

David W. R. Morgan, manager, Steam Division, Westinghouse Electric Corp., Pittsburgh, has been appointed general manager of the company's South Philadelphia works.

—o—

William J. Wolf, Hamilton, O., has been elected vice president, David J. Joseph Co., Cincinnati. He will be associated with its Middletown Iron & Steel Division, effective April 1.

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F. H. Kilberry has been elected executive vice president and a director, Nordberg Mfg. Co., Milwaukee.

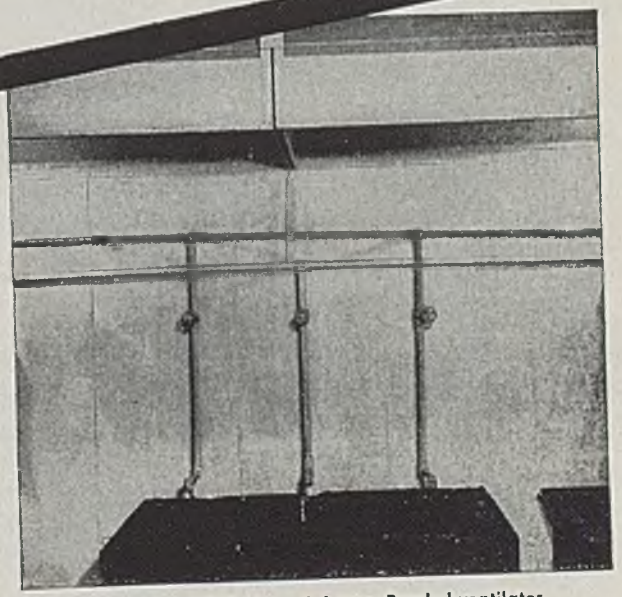
—o—

A. Lightfoot Walker has been named executive assistant to R. S. Rheem, president, Rheem Mfg. Co., New York. Mr. Walker has served as general manager of Rheem Mfg. Co. Pty. Ltd., in Australia, since the formation of that subsidiary in 1937.

—o—

A. F. Franz has been named works manager and will have complete jurisdiction over all operations, Colorado Fuel & Iron Corp., Denver, Colo. J. D. Sullivan has been appointed vice president and general sales manager, Steel Divi-

this NEW coated sheet steel resists acids, alkalies and water



Installed in 1937, these Asbestos-Bonded ventilator hoods over acid-pickling tanks are still on the job.

Service and laboratory tests indicate that ARMCO Asbestos-Bonded Steel Sheets assure exceptional resistance to acids, alkalies and water. This new coated steel also resists various corrosive gaseous compounds.

Tests include immersion in sea water, exposure to acids and acid fumes, salt solution, and salt spray. Results indicate that "Asbestos-Bonded" has extra corrosion resistance for applications such as chemical and salt brine tanks, railway car parts, industrial air conditioning equipment and marine uses.

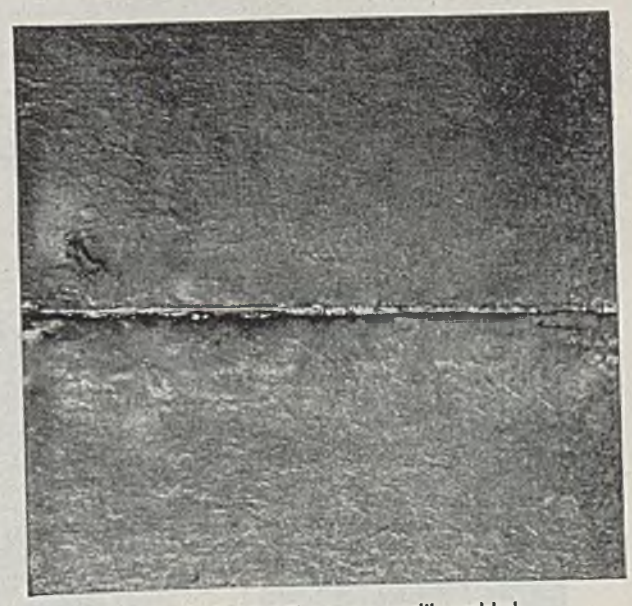
DOUBLE PROTECTION

The corrosion resistance of ARMCO Asbestos-Bonded Steel is that of a galvanized sheet protected by a tightly adhering coating of asbestos that is impregnated with asphalt.

This coating has all the corrosion-resisting properties of a fibrous, asphalt coating—and more. The fibers embedded in the zinc assure longer adherence of the coating to the metal with greater resistance to erosion.

WRITE FOR SAMPLES

If the protective features of zinc and asphalt-impregnated asbestos coatings on sheet steel interest you, write us for samples. Just ask about Asbestos-Bonded Steel—Armco's newest special-purpose sheet. The American Rolling Mill Company, 1391 Curtis Street, Middletown, Ohio.



Asbestos-Bonded Sheets are readily welded.

ARMCO

THE AMERICAN ROLLING MILL COMPANY

SPECIAL-PURPOSE SHEET STEELS

sion. **Douglas Millard** continues as head of fuel and chemical sales. **G. E. Troutman** has been promoted from assistant division sales manager to division sales manager, Rocky Mountain Division.

—o—

Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., has named the following sales representatives: **Cortlandt W. Guthrie**, Philadelphia; **R. D. Leach**, Birmingham, to serve Tennessee, Mississippi, Alabama and Louisiana.

—o—

J. B. Martin has been appointed controller, Mullins Mfg. Corp., Warren, O. **John P. Hochadel** has been promoted to assistant controller; **Royal L. Schiller**, staff legal counsel; and **Arthur S. Greenamyer**, chief cost accountant.

—o—

Lars E. Ekholm has joined the metallurgical engineering staff, Climax Molybdenum Co., New York. For the past 7 years, Mr. Ekholm has been metallurgical engineer, Alan Wood Steel Co., Conshohocken, Pa.

—o—

Will L. Corbett recently was appointed superintendent of industrial relations, Waukegan, Ill., works, American Steel & Wire Co., Cleveland. Mr. Corbett joined the Waukegan works 8 years ago as personnel supervisor.

—o—

Edward A. Carney has been appointed sales representative in the Detroit district and **H. Vander Schilden**, sales representative in the Chicago district for the Lake Erie Engineering Corp., Buffalo.

—o—

Jones & Laughlin Steel Corp., Pittsburgh, has announced the following changes in its district office sales staffs: **R. G. Scoggins** has been appointed district sales manager in Los Angeles, succeeding **T. W. Bell** who has been appointed special sales representative in that city. **H. M. Knobloch** has been appointed district sales manager of the company's newly opened district sales office in Indianapolis. Since October, 1944, Mr. Knobloch has been assistant district sales manager in Cincinnati. **W. S. Wainwright** has been appointed district sales manager in San Francisco. **W. L. O'Connell** has been appointed resident manager of sales in South Bend, Ind., having served in that capacity in Indianapolis since 1942.

—o—

R. F. Muller, sales engineer with the New Orleans district office, Allis-Chalmers Mfg. Co., Milwaukee, has been promoted to assistant manager of the office.

—o—

Jerome Goldman has returned to the Warehouse Sales Division, Levinson Steel Sales Co., Pittsburgh, after 3 years' service in the Army.

—o—

Milton T. Satter, with the Aetna-Standard Engineering Co., Youngstown, for the past 4 years, has been named a roll engineer with the Roll Sales Division.

—o—

John S. Devey has been appointed director of training in the Manufacturing Division, Crosley Corp., Cincinnati. Mr. Devey at one time served as director of training and education in the Clairton works, Carnegie-Illinois Steel Corp., later as director of training and safety, Carl L. Norden Inc., Elmira, N. Y., and New York.

—o—

C. T. Evans has been appointed consulting engineer, **C. W. Kuhn**, assistant manager of development, **R. A. Millermaster**, assistant manager of development, research and development staff, Cutler-Hammer Inc., Milwaukee.

—o—

Howard H. Wilder has been named chief metallurgist, Foundry Division, Eaton Mfg. Co. Mr. Wilder formerly was research metallurgist, Wilson Foundry & Machine Co., Pontiac, Mich. During the war he served with the Gray Iron Foundry Section, War Production Board, Washington, and he is secretary, Detroit Chapter, American Foundrymen's Association.

—o—

Sylvester N. Smith has been placed in charge of the recently opened Detroit office of the Ferro Enamel Corp., Cleveland. The new office is in the Ford building.

—o—

W. W. Scull has been named production manager of plants, B. F. Goodrich Chemical Co., Cleveland. He formerly was plant manager, Louisville, and Port Neches, Tex., government synthetic rubber plants operated by the company.

—o—

Elmer Brooks Carter has been elected vice president, Wheeling Corrugating Co., Wheeling, W. Va., to succeed the late **John H. Robinson**. Mr. Carter will be in charge of sales. He returned Oct. 1, 1945, from service with the Army, and resumed his duties as assistant vice president.

—o—

M. J. Gross has been named manager of engineering, General Electric X-Ray Corp., Chicago. Mr. Gross recently returned from a 4-month investigation into the manufacture of x-ray equipment in Germany.

—o—

Joseph E. Stein has been elected to the board of directors, Weber Dental Mfg. Co., Canton, O. He is vice president in charge of production.

—o—

Comdr. W. H. Spowers Jr., Bureau of Ships, Navy Department, has been cited by the Navy for his work in designing, building and operating galvanizing shops at five Navy yards, and has been authorized to wear the commendation ribbon.

—o—

Robert J. Leary, New York, has been appointed a sales representative of Eastern Stainless Steel Corp., Baltimore. His territory includes northern New Jersey, metropolitan New York and Orange, Putnam, Rockland and Westchester counties in New York. Prior to service with the Army Air Forces, Mr. Leary was with the company in its Chicago office.

—o—

Duriron Co. Inc., Dayton, O., announces the following changes in its executive personnel: **R. C. Schenck**, son of the company's founder, has been made executive vice president; **D. E. Jack**, vice president in charge of sales and engineering, has moved from Dayton to the company's offices in New York; **W. D.**

R. G. SCOGGINS

HOWARD H. WILDER

HERE'S WHY THESE CHUCKS AND SEGMENTS TURN OUT BETTER JOBS

With the patented Sterling No. 2 Chuck, each segment is mounted separately, every grooved abrasive unit fitting into its proper position. With a simple twist of the socket wrench, segments can be tightened and remain solid throughout their long life, regardless of the type of material being ground. Smoother operation, better finish, no chatter marks—these are natural results of Sterling's safe, rigid fastening of the segments by the chuck.

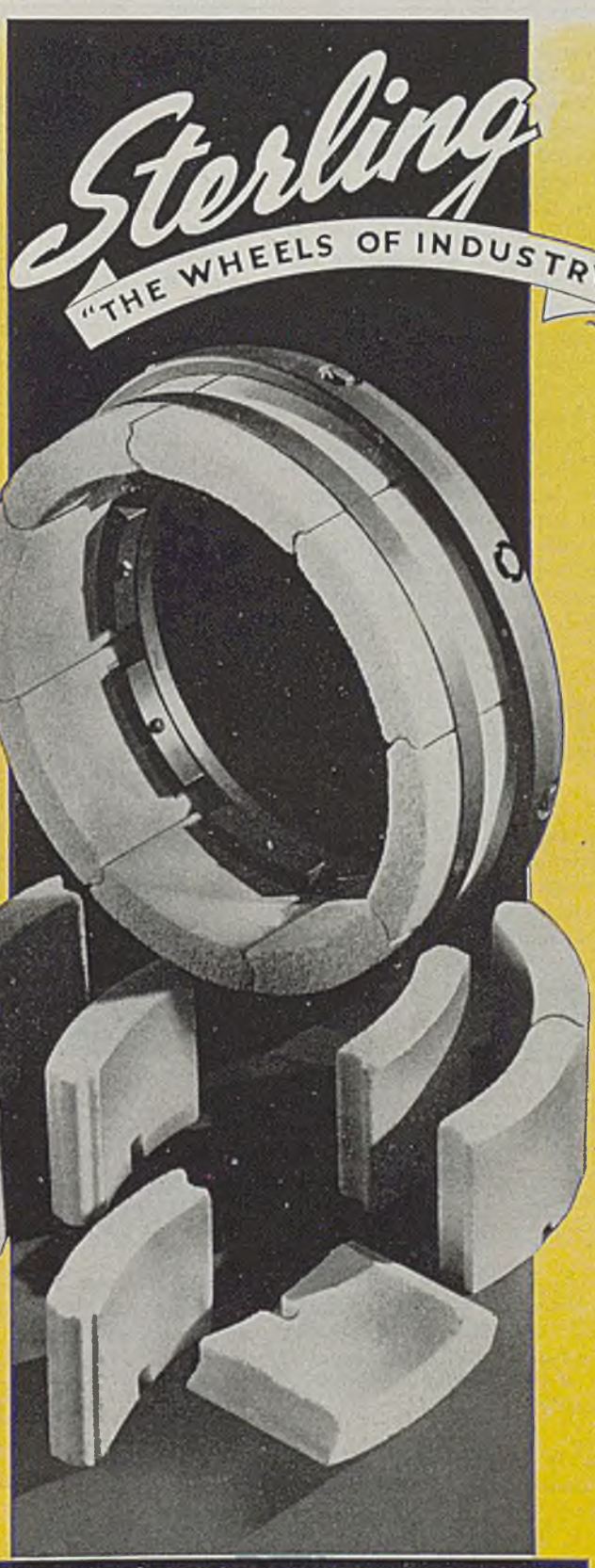
Sterling No. 2 Segments are not gap-type. There is no dangerous open space between them. The patented, interlocking design of these segments means added strength throughout the entire abrasive ring . . . provides cooler, faster grinding at lower than usual cost.

Take advantage of Sterling's time-saving, money-making continuous shearing action which these chucks and segments provide. Full information upon request.

Your Sterling Specification Selector is Ready for You!

A full listing of the proper segments to use for all kinds of surface grinding . . . complete information, too, on the use of Sterling Wheels for every grinding use.

Send for it today!



• STERLING ABRASIVES •

THE STERLING GRINDING WHEEL DIVISION
OF THE CLEVELAND QUARRIES COMPANY
TIFFIN, OHIO

THE WHEELS OF INDUSTRY

Staley, formerly in charge of the Chicago sales office, has been transferred to New York and is succeeded by **R. A. Prosser**, who until recently was with Illinois Clay Products Co.; **W. A. Schumacher**, formerly with U. S. Rubber Co., New York, has been placed in charge of the Detroit sales office; **W. D. Halloran** and **D. B. Stone** have been added to the Dayton sales force; **R. H. Stalbaum** has been transferred from upper New Jersey territory to New England; **R. A. Dittbrenner**, a member of the New York sales office, now also is the company's advertising manager.

—o—

J. S. Tatman has been elected chairman of the board, and **John Avery**, president and general manager, Roots-Connersville Blower Corp., Connersville, Ind. Mr. Tatman has been with Roots-Connersville since graduating from Purdue University in 1902.

—o—

F. C. Messaros has been appointed chief engineer and **J. S. Frame**, chief draftsman, American Engineering Co., Philadelphia.

—o—

Paul J. Bastian has been named vice president in charge of manufacturing, Tyson Bearing Corp., Massillon, O., resigning as production manager, Watson-Flagg Machine Co., Paterson, N. J., to assume his new position.

—o—

E. F. Horkey has been named purchasing agent for Conlon Bros. Mfg. Co., Chicago.

—o—

Henry L. LeMay has been named manager of the Chicago office and warehouse, Bay State Abrasive Products Co., Westboro, Mass. For the past 3 years, Mr. LeMay has been associated with the Norton Co., in the Chicago area.

—o—

Curtis E. Calder, chairman, Electric Bond & Share Co., and **Joseph V. Santry**, president, Combustion Engineering Co., have been elected to the board of directors of the National Association of Manufacturers.

—o—

Severn W. Kittredge has been appointed manager of operations, Brainard Steel Corp., Warren, O., succeeding **Richard F. Herr**, resigned. Mr. Kittredge, prior to service with the Navy, was associated with Talon Inc., Meadville, Pa., in an operating capacity.

—o—

Joseph G. Thompson Jr. has been advanced to assistant general paint manager, Pittsburgh Plate Glass Co., Pittsburgh. **Fergus A. O'Connor**, formerly supervisor of maintenance, painter sales, has been appointed supervisor of dealer sales. **Nelson A. Mason** now is supervisor of maintenance, painter sales. **Leonard W. McGarity**, returning to the company after 3 years' service with the Navy, has been appointed supervisor of paint department sales to the company's stores, and **Kenneth E. Whitekettle**, for the past 3 years with the Eighth Air Force, has been appointed supervisor of brush sales.

—o—

P. H. Lair, industrial engineer and research consultant, has been appointed manager of the New York sales office of the Dampney Co. of America, Hyde Park, Boston, Mass.

—o—

William H. Nichols, vice president, Pittsburgh Rolls Division, Blaw-Knox Co., Pittsburgh, was honored recently on the completion of 60 consecutive

WILLIAM H. NICHOLS

years with that division. Mr. Nichols, 78, began working when 9 years old, holding several jobs before joining Pittsburgh Rolls in 1886.

—o—

John E. Rosser, formerly with Heyl & Patterson Inc., Pittsburgh, has joined the purchasing department, Levinson Steel Co., Pittsburgh.

—o—

H. Robert Hughes has been appointed assistant chief engineer in charge of raw materials, Jones & Laughlin Steel Corp., Pittsburgh.

—o—

Charles H. Sawyer has been named research engineer of the Koppers Coal Division, Eastern Gas & Fuel Associates. **Paul J. Stein** has been appointed industrial service engineer.

—o—

James F. Hoffer has been appointed chief engineer, Superdraulic Corp., Dearborn, Mich. Until recently, Mr. Hoffer had served as chief research engineer of Hydraulic Machinery Inc., Dearborn, and he will continue with that organization as an engineering consultant. **John S. Shafer** has joined Hydraulic Machinery Inc., as sales engineer. For the past 5 years, Mr. Shafer has been in charge of engineering, Robbins Engineering Co.

—o—

John K. Broderick, president, Broderick & Bascom Rope Co., St. Louis, has been re-elected president of the Wire Rope & Strand Manufacturers Association.

—o—

Emanuel Weintraub has rejoined the Garod Radio Corp., Brooklyn, N. Y., as purchasing agent. Prior to his 30 months' service with the Navy, Mr. Weintraub had been with the Garod company for 5 years as director of material procurement and production planning.

—o—

Eugene D. Milener has been appointed co-ordinator of general research of the American Gas Association. **Mahlon A. Combs** has been promoted from assistant secretary of the industrial and commercial gas section, to secretary, succeeding Mr. Milener.

—o—

Harris E. Wainwright has been appointed national account representative for the New York area, paint department, Pittsburgh Plate Glass Co., Pittsburgh.

—o—

John D. Hall, with Braeburn Alloy Steel Corp., Braeburn, Pa., for 15 years, has resigned his position with that company and is now living in St. Petersburg, Fla.

—o—

Frank E. Walling, general manager, Lewis Foundry & Machine Division, Blaw-Knox Co., Pittsburgh, and **Charles W. Pearson**, president, Buflovak Equipment Division, have been elevated to vice presidents of Blaw-Knox Co., and to memberships on the board of directors. Both will retain their former duties.

—o—

Tye M. Lett Jr. has been appointed director of exports, Crosley Corp., Cincinnati, succeeding **J. W. DeLind Jr.**, resigned. Mr. Lett has been assistant export director since July, 1945, when he joined the Crosley organization.

—o—

D. Paul Ayers, formerly division engineer, Kansas Power & Light Co., at Topeka, Kans., has joined the sales engineering staff, Copperweld Steel Co., Glassport, Pa.

—o—

Dr. Harlan L. Trumbull, director of synthetic rubber and textile research,

HARRY M. FRANCIS

Who has been elected vice president in charge of sales, American Steel & Wire Co., Cleveland, noted in STEEL, March 11 issue, p. 82.

HAROLD F. BRANDT

Recently elected president and general manager, Dobbins Mfg. Co., Elkhart, Ind., and St. Paul, noted in STEEL, March 11 issue, p. 82.

ROSCOE M. SMITH

Who has been named president of all village plants, Ford Motor Co., Dearborn, Mich., and noted in STEEL, March 11 issue, p. 82.

B. F. Goodrich Co., Akron, will serve as manager of the research and development division, synthetic rubber department, Rubber Reserve Corp., Washington.

—o—

B. L. Rawlins has been appointed general attorney, Carnegie-Illinois Steel Corp., Pittsburgh. Mr. Rawlins joined the law department of United States Steel Corp. of Delaware in 1938 where he has served until his present appointment.

—o—

H. F. Spoehrer, vice president, Sporlan Valve Co., St. Louis, was elected president, Refrigeration Equipment Manufacturers Association at its spring conference in Chicago. He succeeds F. J. Hood, secretary-treasurer, Ansul Chemical Co., Marinette, Wis.

—o—

William J. Wadsworth Jr., formerly director of sales, R. Hoe & Co. Inc., New York, will join Noble & Wood Machine Co., Hoosick Falls, N. Y., as foundry manager.

—o—

E. W. Husemann has joined the metallurgical staff, LaSalle Steel Co., Chicago. Mr. Husemann formerly served as metallurgist with Copperweld Steel Co., and Republic Steel Corp.

—o—

Walter F. Spoerl has been appointed general sales manager, Mechanical Goods Division, United States Rubber Co., New York.

—o—

Sigmund A. Czarnecki has been appointed production engineer for Hamilton Standard Propellers Division, United Aircraft Corp., East Hartford, Conn. Ermano Garaventa has been promoted to process development engineer.

—o—

William C. Domino, for nearly 20 years sales and field engineer for the West Steel Casting Co., Cleveland, has resigned to join the Swedish Crucible Steel Co., Detroit, as representative in northern Ohio.

OBITUARIES...

George M. Laughlin Jr., 73, a member of the board of directors and executive committee, Jones & Laughlin Steel Corp., Pittsburgh, died March 9 at his home in Lake Wales, Fla. Mr. Laughlin, a grandson of James Laughlin, partner in the principal firm, was superintendent of the Soho plant for several years. He was elected a vice president of the company and a director in 1923, and was chairman of the board from 1928 to 1936.

—o—

Albert L. Scott, 67, president, Lockwood Greene Engineers Inc., New York, died recently at his home at Chappaqua, N. Y., following a heart attack.

—o—

Ross W. Judson, 65, founder and former president, Continental Motors Corp., Detroit, died March 11 in Miami Beach, Fla. Mr. Judson organized the Continental company in 1903, becoming president in 1920 and chairman of the board in 1930, retiring shortly thereafter.

—o—

Frank Snyder, 47, director of the Standards Division, White Motor Co., Cleveland, died March 10 at his home in that city. He had recently completed 22 years with the company.

—o—

Harry L. Green, traffic manager with the United States Steel Supply Co. in Cleveland, died March 9 in that city. He had been associated with the company 42 years.

—o—

Alvin K. Smalley, 50, manager of sales, Welded Alloy Tube Division, Kenilworth, N. J., Carpenter Steel Co., died recently. Mr. Smalley had been associated with the company 15 years.

—o—

James D. McGann, 65, who retired recently as manager of the industrial engineering and construction department, International Harvester Co., Chicago, died March 6 in that city. Mr. McGann had been associated with the company 43 years, and he had supervised the design and construction of many of its plants.

—o—

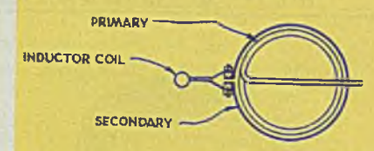
Joseph B. Crane, 66, export manager, Combustion Engineering Co. Inc., New York, died at his home in Bridgeport, Conn., March 9, following a heart attack. He became district manager for the company in Pittsburgh in 1926 and was named export manager in 1937.

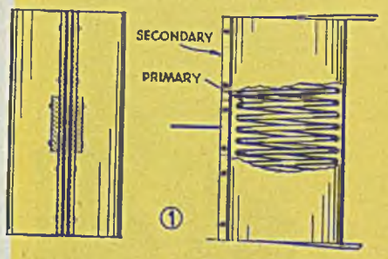
—o—

William N. Weaver, 79, senior partner in the firm of Nathan Trotter & Co., Philadelphia, and associated with the company 57 years, died March 8.

—o—

Fredrick V. Hetzel, 76, formerly chief engineer, Link-Belt Co., Chicago, died recently in Philadelphia.



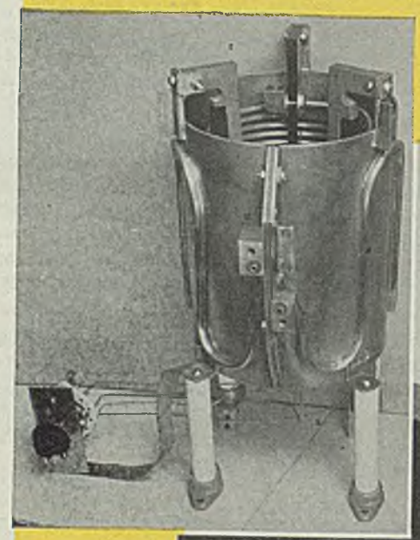


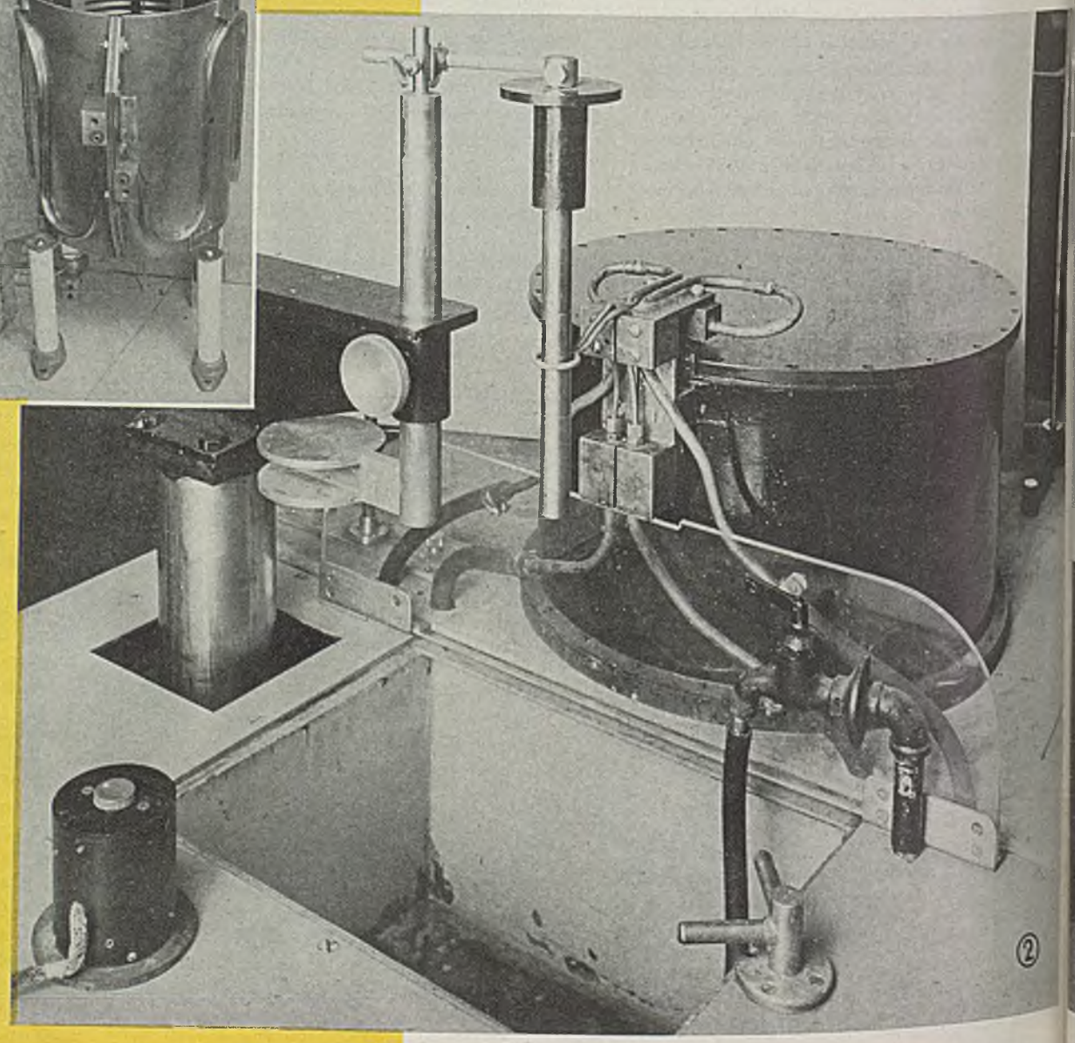
CURRENT TRANSFORMER

HIGH INTENSITY Induction Heating

By WESLEY M. ROBERDS
Engineering Department
Engineering Products Division
Radio Corporation of America
Camden, N. J.

Carbon steels may be fully surface hardened at high speed through use of high power concentrations. Author says design and process engineers should select right technique for job at hand





UNTIL the advent of high power, high frequency induction heating, very little could be done to develop techniques of extremely rapid heating. Although much has been written recently concerning the advantages of induction heating, most authors have over-looked the fact that by the use of high frequencies entirely new heating techniques are made possible.

It is the hope of the author to present here some of the results of high intensity heating and to show how this technique fits into the induction heating field in general.

In those applications for which high frequency induction heating is suited, this method offers three very important advantages:

1. The heating can be precisely controlled not only in intensity but in extent and depth;
2. The work does not have to be contacted by the source; and
3. By the use of the upper frequencies and special applicators power, and consequently heat, can be applied to the work in the highest possible concentrations.

Because of the nicety of control and the fact that the work need not be contacted, induction heating is admirably suited to automatic processes. The lower frequencies have been used for industrial heating for more than 20 years. And, at present, thousands of kilowatts of high frequency power are being used in melting, refining, and surface hardening operations.

In some applications the use of high frequency induction is absolutely essential. For example, take the manufacture of electronic tubes. The electronic tube industry uses hundreds of kilowatts of high frequency power for "baking out" tubes during the exhaustion process. While the tube is attached to the exhaustion system, it is placed inside a multi-turn coil which is supplied with a high frequency current. By induction, the metal parts inside the glass envelope quickly are brought to incandescence and the absorbed gases are driven out. By this means the metal parts can be held at temperatures above 1000° C while the temperature of the glass seldom exceeds 200° C.

Until recently practically all induction heating was done with the lower frequencies, i.e., frequencies less than 25,000 cycles per sec and the generators were motor driven dynamos and spark gap oscillators. With the development of high power radio broadcast equipment, how-

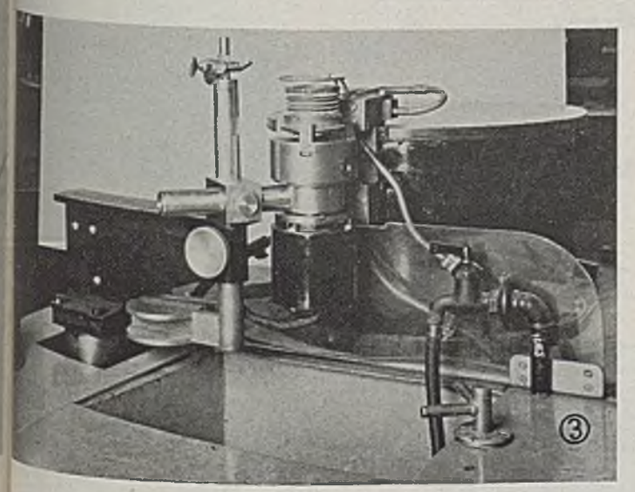
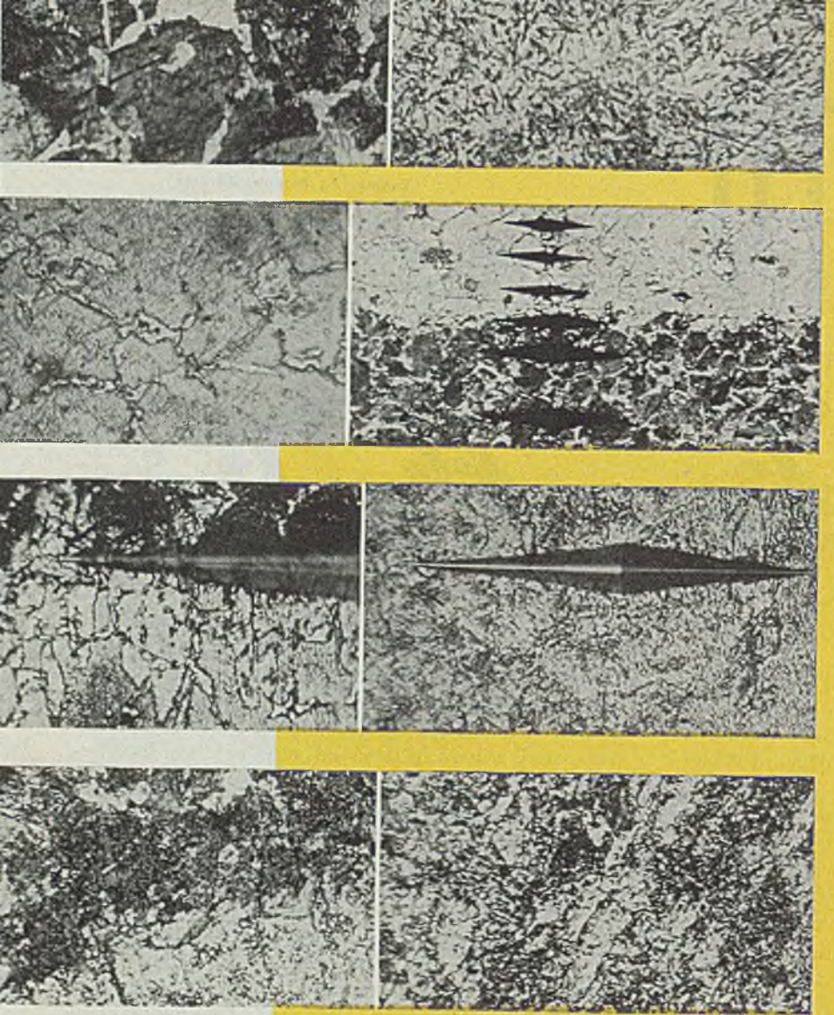
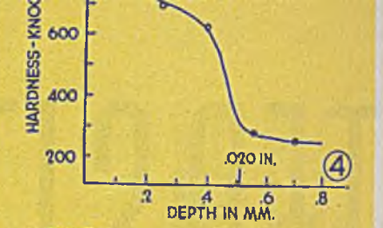


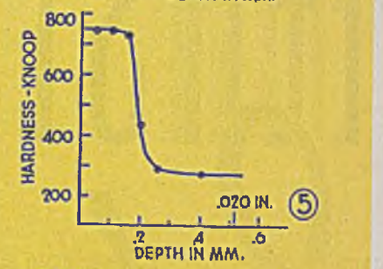
Fig. 1—Coupling transformer used with high-power concentration techniques; (above)—general design; (below)—production model

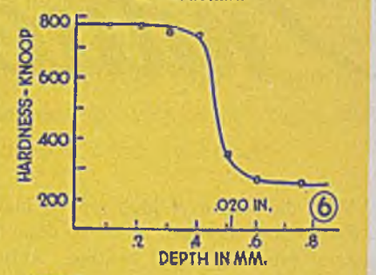
Fig. 2—Coupling transformer and hydraulic scanning equipment (including magnetic holder) as set up to harden piston pins on an experimental basis

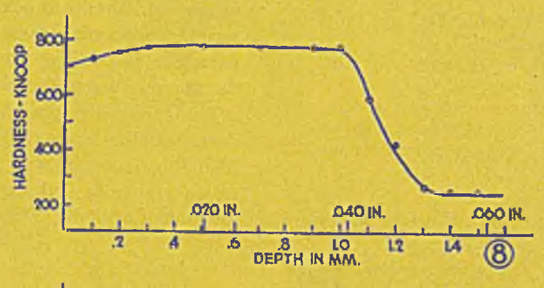
Fig. 3—Arrangement for rotating work while it is being heated. Here an oil seal device is being hardened and silver-soldered in a simultaneous operation

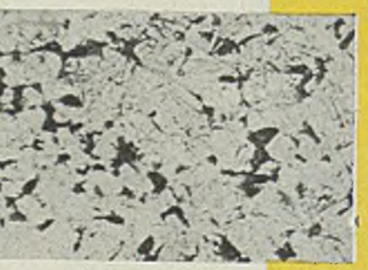












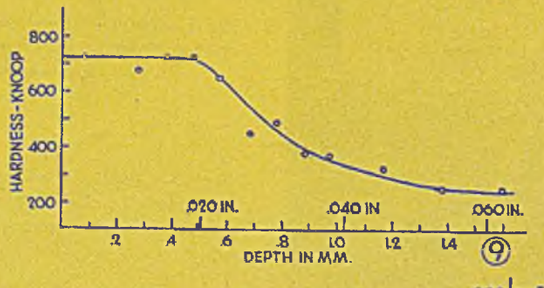


Fig. 4—Sample of SAE-1030 steel heated at scanning rate of 1.6 in. per sec with power concentration of 65 kw per square in. followed by water quench. Photomicrographs show (left) annealed core unaffected by surface hardening, (right) hardened zone; curve shows maximum hardness was 780 Knoop. All photomicrographs at magnification 460X

Fig. 5—This also is a sample of SAE-1050 but scanning speed was 4.5 in. per sec and power concentration was 85 kw. Photomicrographs show (left) hardened zone, outer skin; (right) thickness of hardened shell was about 0.008-in.; indentations were made by hardness tester; curve indicates hardness was near maximum obtainable for this steel

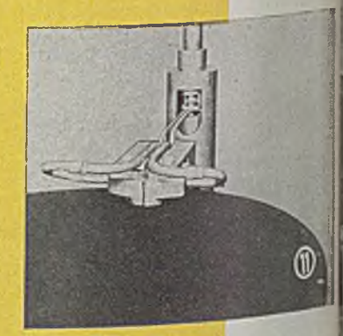
Fig. 6—Sample of SAE-1050 run at 4.5 in. per sec but at power concentration of 110 kw. Shell was about 3 times as thick as for Fig. 5 sample. Photomicrographs show (left) transition zone; (right) hardest zone; hardness curve

Fig. 7—SAE-1050 sample heated at same power and speed as Fig. 6 sample but quenched by self-conduction alone. Depth of shell was same but hardness was less. Photomicrographs show (left) transition zone; (right) hard zone; hardness curve

Fig. 8—In this case, scanning speed was reduced to 0.8-in. per sec and power concentration to 40 kw, followed by water quench. Heating time was 0.19 sec. Photomicrograph (left) shows hardened zone; (right) hardness curve

Fig. 9—This sample of SAE-1030 was heated in stationary position with multiturn coil at power concentration of 8.5 kw and heating time of 0.9 sec. Photomicrograph (left) shows hard zone; compare curve with Fig. 8

Fig. 10—Shown here are results of heating sample of SAE-1090 in spheroidized state. Scanning speed was 2.41 in. per sec, power concentration 100 kw, water quench. Photomicrograph show (left) core—soft zone; (right) hardened zone; hardness curve



ever, it became possible and economical to use electronic tubes to generate high frequencies for industrial heating purposes. Because the size and cost of the electronic circuit components decrease rapidly as the frequency increases, it was known that electronic generators would have to operate at frequencies above 200,000 cycles per sec to be able to compete with the dynamo and spark gap generators. Therefore, shortly before the beginning of the war, rather extensive investigations were begun in the United States and in Russia to determine whether or not the higher frequencies could be used practically for industrial power purposes and if so, what bearing, if any, frequency had on the results of induction heating.

It soon became apparent that frequency is an important, though not a critical, factor and that the proper range of frequencies for a given heating problem is determined by the size and shape of the work, and by the nature of the heating job involved. But, more important, it was found that the higher frequencies offer the possibility of extremely high power concentrations.

Types of Applications

With respect to applications, induction heating can be compared to heating with gas. For example, in the latter case when it is desired to heat large parts more or less uniformly, the piece is placed in a furnace and the heat is applied in relatively low concentrations. But if work is to be rapidly heated locally, a torch must be used.

A similar situation exists in induction heating. Those applications, such as melting or the uniform heating of large bodies, require that the energy be spread over wide areas. Therefore, the work is surrounded as completely as possible with the applicator coil, and power at a relatively low level is applied at frequencies below 10 kilocycles per sec. However, when it is desired to apply heat at very high intensities, above 100 kc are necessary.

Not only may the power concentration be increased by going to high frequencies, but a more precise delineation of the heated volume becomes possible as the frequency is increased (up to a frequency of a few millions of cycles per sec). That is, the higher the frequency the less the depth of current penetration into the work and the more sharply defined are the areas which are heated. Thus, with the combination of the higher frequencies and the high power concentrations which they make possible, some astonishing heating results may be attained. For example, a strip ¼-in. wide and 0.05-in. deep around a 2-in. steel cylinder can be brought to the critical hardening temperature in the order of 1/10-sec. If the cylinder is solid, by far the greater part of its bulk is cold at the end of 1 or 2/10 sec; if the power is turned off or the applicator moved at this time, the heated volume tends to quench by heat conduction to the inner, cooler mass.

As further examples, a copper tube with a ⅛-in. wall thickness can be melted at a point ½-in. from where it is immersed in water; steel can be melted while completely immersed in water, etc. Such stunts are suggestive of practical applications for the use of power concentrations

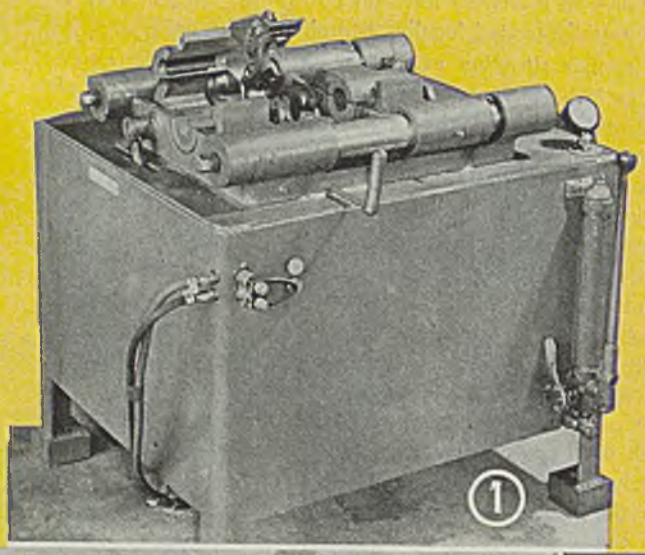
(*Please turn to Page* 161)

Fig. 11—(Opposite page) close-up of 1-turn applicator coil shown supplying 30 kw to ½-in. dowell pins passing through it. (Left)—general view of the feeding mechanism, complete except for water-cooling lines. (Inset)—hardened pins sectioned to show hardening pattern

TAILOR-MADE

Boiler Tubing

. . . . fabricated from standard-length tube stock by pressure welding



BOILER tubing, tailor-made to any desired length, is being fabricated from standard-length tube stock by the use of oxyacetylene pressure-welding. In addition to welding short lengths of tubing to standard 20-ft lengths, process also is used to join together standard lengths. In this manner, continuous tubing 95-ft long has been produced. Production delays are avoided as tube stock of suitable length is readily available.

In welding with this process, squarely cut surfaces are butted together under pressure. While this pressure is maintained, the joint is heated to a high temperature, but below the melting point of the steel, by means of a ring of oxyacetylene flames. Increased pressure then is applied to work by a hydraulic pump and continued until upsetting of the joint occurs, producing a weld of high quality.

Work is clamped in oxyacetylene pressure-welding machine shown in Fig. 1 by means of two split jaws. In illustration, the stationary left-hand jaw is open to demonstrate method of introducing and removing the work. A special ring-type heating head, also open, is shown between the jaws. Control valve for gases is on left front of the machine. Hydraulic pressure applied to the clamping and push-up pistons is provided by pump shown at the right of machine.

Ends of the tubing to be pressure-welded are prepared for welding by a simple cut-off operation done on a lathe, thus producing clean, squarely mated edges. This careful edge preparation is necessary for making consistently strong welds in tubes subject to high temperatures and pressures. With the two lengths of tubing clamped into machine, initial pressure is applied and the welding flames are lighted. During the heating operation, the welding operator positions the welding head directly over the joint. A slight lateral movement of the head is used during the last few seconds to prevent any local overheating or excessive surface fusion. Pressure on the joint is controlled by an operator.

Both heating and pressure are maintained until plastic upsetting occurs. Weld is completed when a predetermined amount of shortening has occurred in the workpiece.

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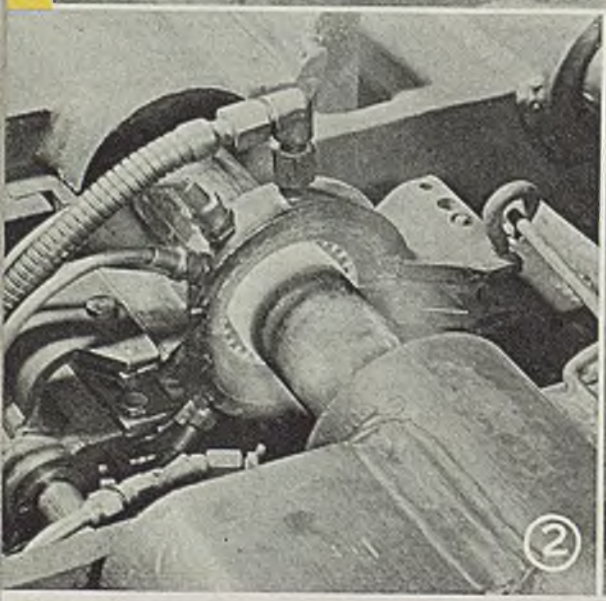

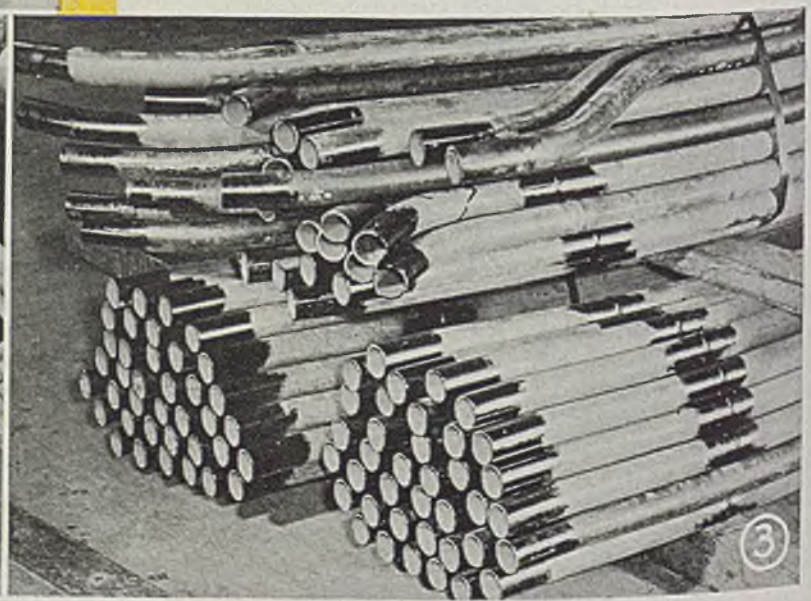

template grinder

. . . . has electronic control of wheel head axial traverse for precise grinding

TEMPLATE grinder with electronic control of wheel head axial traverse, and specially designed for precise grinding of templates and other work up to 72 in. long, 8 in. deep, and 1 in. thick, without re-positioning, provides templates for many types of profiles, including those encountered in aircraft fuselage and wing manufacture. Production cost is low due to the speed with which the grinding operation may be performed.

The machine, shown in Fig. 3, originally was designed for the specific purpose of grinding templates used in laying out and checking automobile body dies and parts produced with such dies. These templates are approximately ⅛-in. thick, and as many as eight can be ground at one time.

The grinder is made by Sheffield Corp., Dayton, O., and consists primarily of a base upon which wheelhead with control panel and optical equipment traverses, the electronic control unit, and a work table with adjustable paralleled work supports. Work, with desired profile scribed on it by either a scriber or by a photographic process, or with a master template mounted on top, is clamped on the worktable.

Supporting parallels are adjusted to the rough outline of work as shown in Fig. 1. Wheelhead is positioned on transverse ways by electronic controls in order to bring the wheel opposite the point where grinding is to start. Axial movements of the workhead may also be accomplished by turning a knurled knob to the left of handwheel (Fig. 2). Wheelhead may be adjusted on a turret to a maximum of 40° on each side of center so as to meet any conceivable requirement for positioning caused by shoulders and other irregularities of profile to be ground.

The grinding wheel reciprocating slide then is properly

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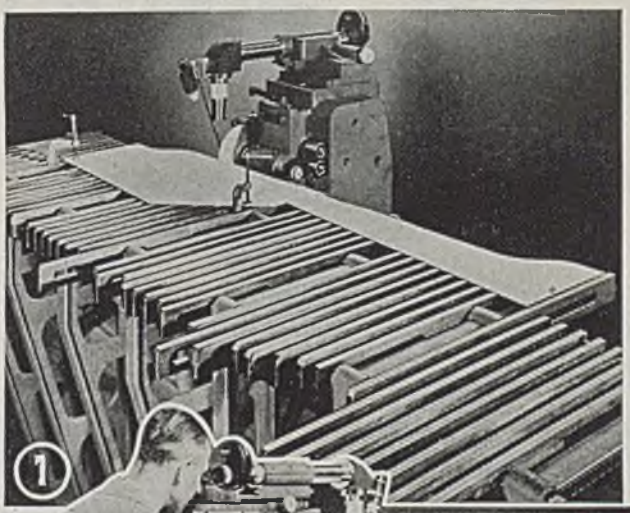
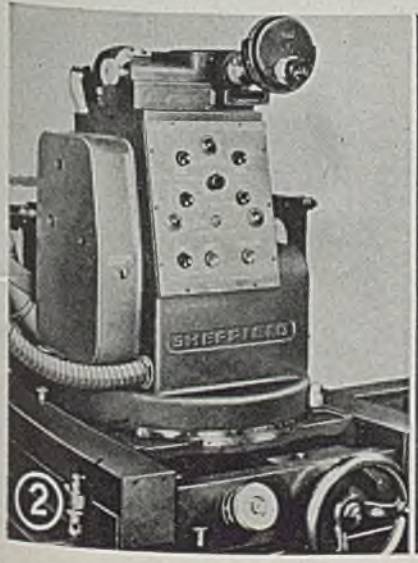
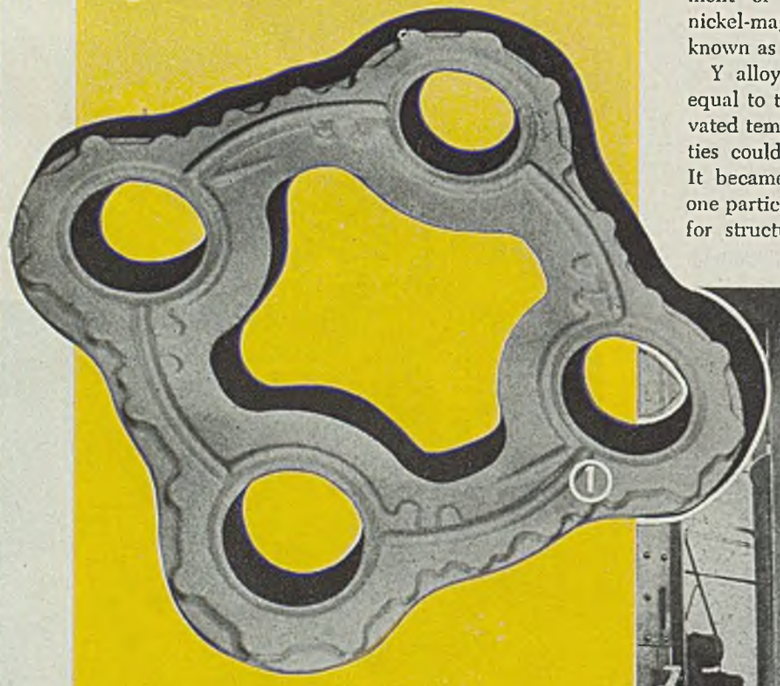




Development of

FORGINGS AND STAMPINGS

International race to develop high-performance airplane engines inspired British metallurgists and engineers in their search for cast and wrought aluminum alloys with greatly improved properties. Quest ends with high-strength materials ideally suited to specialized mass production heat treating and forging or stamping methods



By J. TOWNS ROBINSON
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High Duty Alloys, Ltd.
Slough, Buckinghamshire
England

LESS than a century ago aluminum alloy forgings and stampings were unknown, although the base metal, first produced in 1845 and exhibited in massive form in 1855, was worked into wrought forms chiefly by rolling and hammering, as far back as 1890.

Heat-treated strong alloys started with discovery of the age-hardening phenomenon by Alfred Wilm in Germany in 1909 and his development of duralumin produced far-reaching effects. Another line of alloy research, starting somewhat later than Wilm's work, did not find actual application during the war. It was devoted chiefly to development of aluminum-copper-zinc, and aluminum-copper-nickel-magnesium alloys, the latter group coming to be known as Y alloy.

Y alloy was found to combine mechanical properties equal to those of duralumin with superior strength at elevated temperatures. Like those of duralumin, these properties could be improved by working and heat-treatment. It became apparent that this alloy and duralumin—the one particularly for engine parts and pistons, and the other for structural parts—were destined to play a very important part in the future of the light alloy industry and in aircraft engineering.

In 1914-1918, limitations of materials already were recognized as being among the chief obstacles to the progress of airplane engine development along the lines of increased power-weight ratios and dependability. Among principal limiting factors in early days were properties of cast aluminum alloy pistons. Strength of these pistons under increasingly severe service conditions left much to be desired, and they lacked, moreover, uniform soundness necessary for dependability. Development of a technique for the large scale production of forged Y alloy pistons became an urgent necessity since it was known that in wrought form this material possessed desired qualities such as uniformly high strength at elevated temperatures, lightness, good thermal conductivity and friction properties.

In the early twenties, piston forgings consisted of a plain cylindrical *cheese* made simply by upsetting a chill cast billet. Piston was machined from this solid *cheese* with, of course, a very high metal loss. Grain flow produced by this process also left much to be desired. Grain size could be so controlled as to give a very fine structure, but pronounced orientation to which we are accustomed today was lacking.

Typical of the mechanical properties of pistons produced by this early technique were those of the Jaguar engine, having a yield-point of 15 to 18 tons psi, an ultimate tensile strength of 23 to 26 tons psi and an elongation of 10 to 15 per cent. Such properties represented a very considerable increase over those obtained from cast pistons.

Introduction of these forged pistons also gave considerable impetus to the development of other well-known engines, while pistons of considerably larger size, also machined from solid forged blanks, were successfully used

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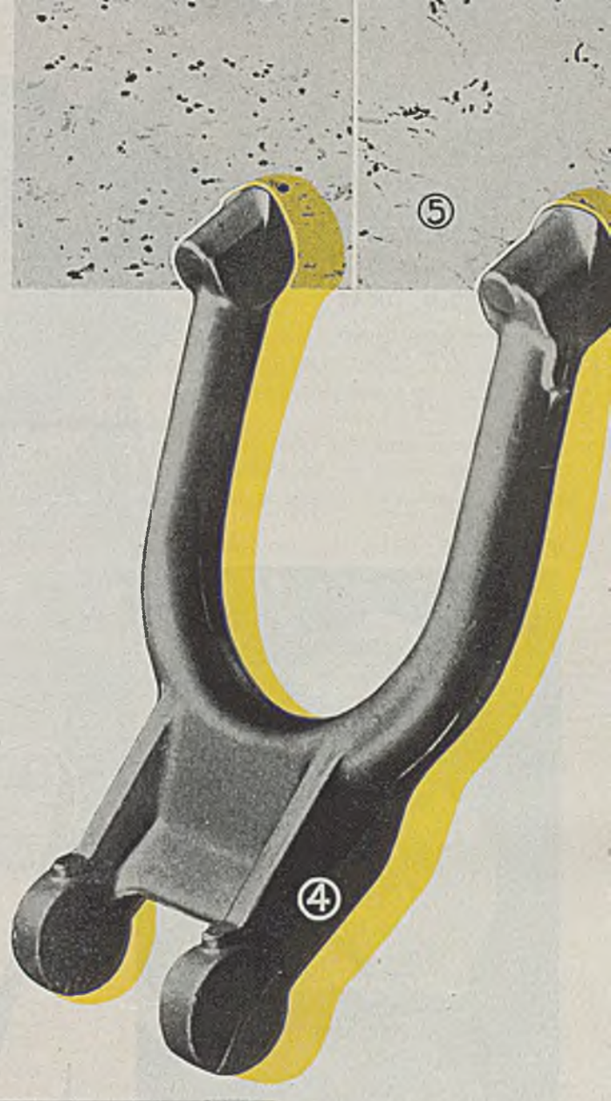


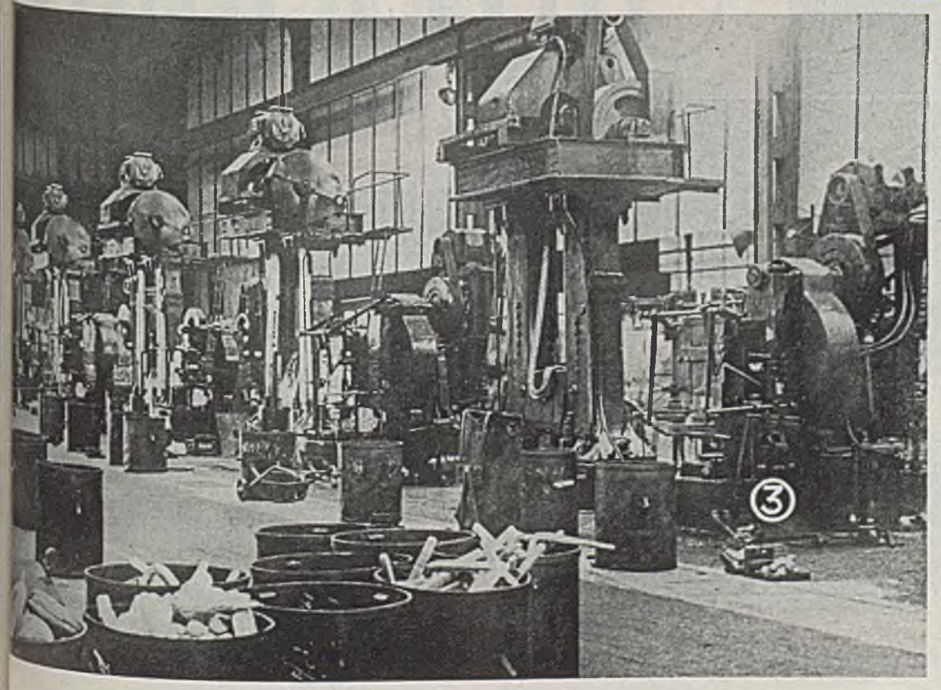


Fig. 1—Reduction-gear carrier plate stamping in Hiduminum RR 56

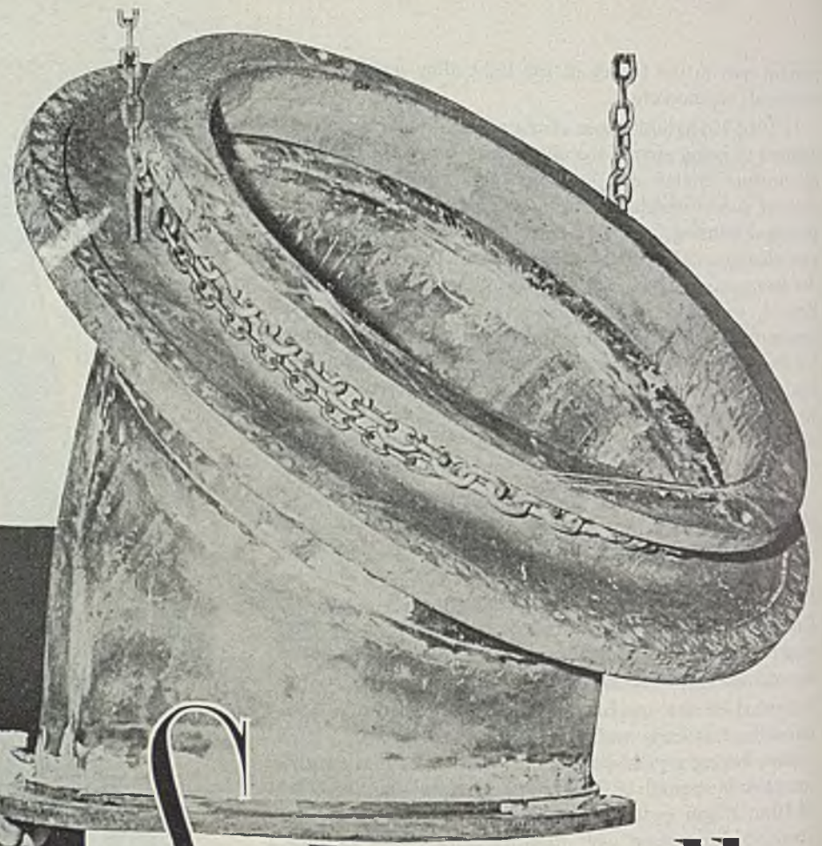
Fig. 2—Battery of modern drop hammers, with capacity of 1 to 3 tons, for production of piston stampings. Data and photos from "Metallurgia"

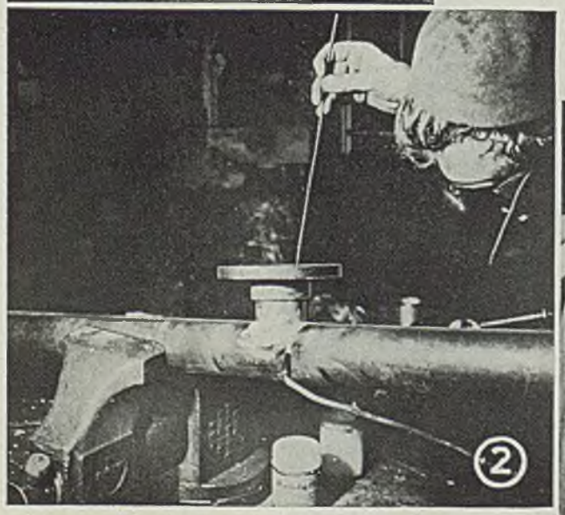
Fig. 3—Individual motors make each machine an independent unit

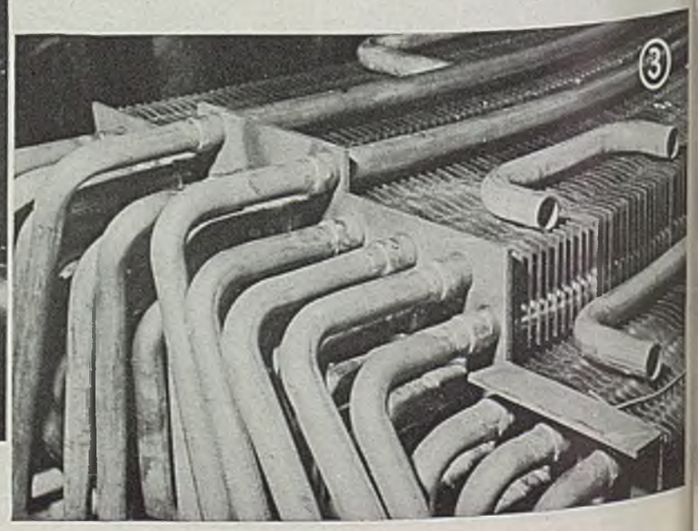
Fig. 4—Tail-wheel fork stamping of RR56

Fig. 5—(Left) Typical microstructure of well-worked RR 59 alloy, showing uniform constituent particle distribution. X200. (Right) A coarse net-work structure and large particle size which has not been completely broken down by working. X200

By
J. C. POWERS JR.
and
H. DeM. LUCAS
Handy and Harman
New York







Silver alloy brazing of Copper Tubing

A highly efficient assembly method which helped shipyards toward huge production objectives. Simplicity of handling a low-temperature alloy is main reason for success

Fig. 1—Fluxing joint area preparatory to brazing flange to end of main injection assembly

Fig. 2—Brazing branch outlet to 4-in. copper pipe

Fig. 3—Tubing connections on a turbo-vacuum compressor brazed with silver alloy

SILVER alloy brazing of copper piping was one of the many efficient assembly methods compounded by American shipyards into production feats that now are history. Actually, two silver brazing techniques became popular with the larger copper shops and vessel builders but, before going into the distinctions, a brief summary of the reasons behind widespread acceptance of this method of joining fabricated copper piping is in order.

Simplicity of handling a low temperature silver brazing alloy is one of the main reasons for its extensive usage. For example, it makes it possible for one man and his helper to produce more work than three or four men can turn out by any other related method. This was true in the days of limitations on manpower, and even today affords a partial solution to some operating troubles.

The problem of training men for this work is comparatively simple. Experience over the war years demonstrated that it is not only possible but practical in a reasonably short period of time to train a man who has never had a torch in his hand.

The physical and flowing characteristics of the silver alloy[1] make it possible to join ferrous and nonferrous metals with the assurance of strong, ductile, leak-tight and corrosion-resistant joints. The joint is penetrated completely. Low temperature at which the alloy melts (1270°F) makes it ideal for use on copper and avoids the possibility of burning the copper through over-heating; low melting point also materially reduces the time required to heat and make a joint.

The amount of silver alloy required for brazing seams and joints in copper piping is generally much less than would be required for some other types of brazing, the reduction amounting to as much as two-thirds and three-fourths in some cases.

The fact that an oxyacetylene torch is used instead of a forge reduces physical labor for operators. Also the torch permits definite control of heat, whereas heat control when brazing with a forge is practically impossible.

Procedure

1. After the back and throat of the pipe have been shaped they should be thin edged; according to regular practices.

2. The entire back and throat should then be annealed to take out all stresses. This is a most important step. If neglected, excessive warping will result when the joint is heated preparatory to brazing.

3. Clean the edge and an area an inch or so back from the thin edge section. This can best be accomplished with a power rotary wire brush. Be sure the joint area is free of all scale, oxides, dirt and grease.

4. Cut a small clamp at each end of the pipe 1 in. deep. This clamp, (or tongue) when closed, will hold the back and throat in position and generally is all that is necessary.

5. Remove the throat from the back and thoroughly flux the entire joint area on both joint members. Proper fluxing is most important. It not only protects the surface from oxidation, while heating, but also cleans the surface so that the alloy will flow freely.

Alternative Applications

The two methods of heating and applying the alloy have proved equally successful. They are the Inside Feed and Outside Feed methods.

Inside Feed Method:

—Assemble back and throat after fluxing. A good jig for taking up any

variations in the fit is helpful. If it is necessary to use a jig to pull the back and throat together, tack the joint at intervals sufficient to hold when the jig is removed.

—Tack the clamps at both ends of each joint.

—Lay the pipe on its side on a flat steel table. Top of the table should be made of at least ¾-in. sheet steel.

—Using a ball or sledge hammer, dress the seam until it lays flat against the table making contact the entire length of the joint.

—Brush out any loose dirt or flux that might have cracked off as a result of the dressing operation.

—Re-flux the pipe along the entire joint both on the inside and the outside of the pipe. It is also advisable to apply a thin coat of flux to the alloy.

—Start heating at the center of the pipe using an oxyacetylene torch with a No. 12 tip or an annealing torch. When using the inside feed method, heating should be started at the center of the pipe to take care of warpage factors and avoid burning the operator's hand as he progresses along the joint. Move the torch in a rotary motion, as indicated in Fig. 5, covering an oval area about 6 x 8 in. This permits the heating of the back and the throat of the pipe to a distance of about 3 in. either side of the actual joint and at the same time heats the joint itself for about 8 to 10 in. (See Fig. 4). As the flux becomes liquid start to concentrate the heat more on the throat section of the joint as it is here that we want the alloy to start flowing. After flowing the alloy a distance of about 6 in. along the joint in the center of the heated area, start moving the torch with a sweeping motion across the joint from the throat to the back. This will help capiliary forces to draw the alloy through the joint. If the joint should start to lift at any point take a small peen hammer and tap it back into position. After the alloy has penetrated through the first 6 in. of the joint, start again to heat another 8 to 10 in. in the same manner as before, being sure to overlap the section just brazed by an inch or so. This will eliminate any chance of voids due to cold sections. Proceed down the joint always working towards oneself until half the seam is completed. Then go to the other end of the pipe and duplicate the above procedure. When starting to braze the other end of the pipe be sure to over-

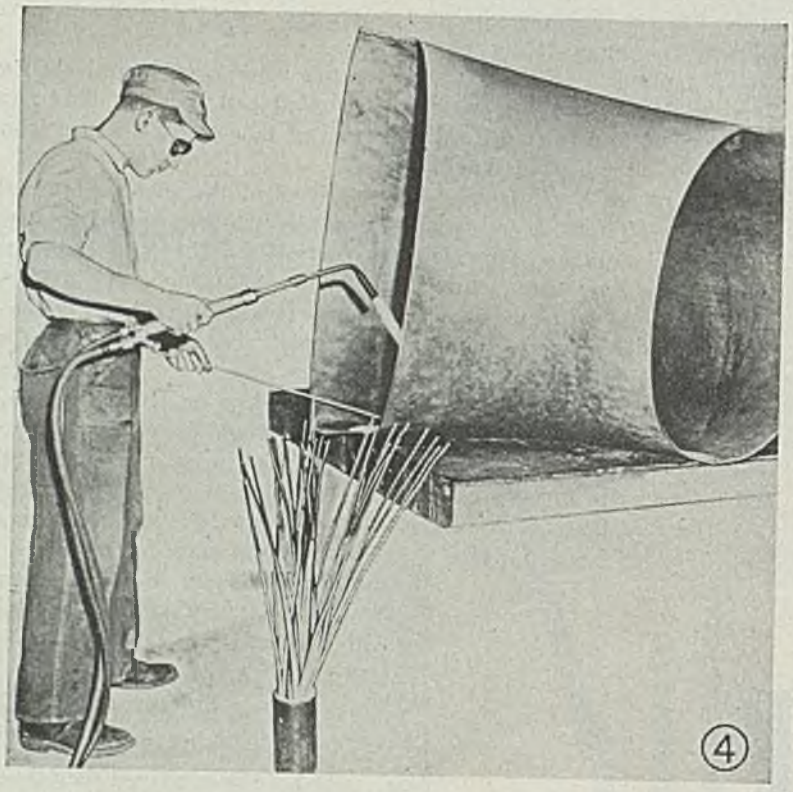
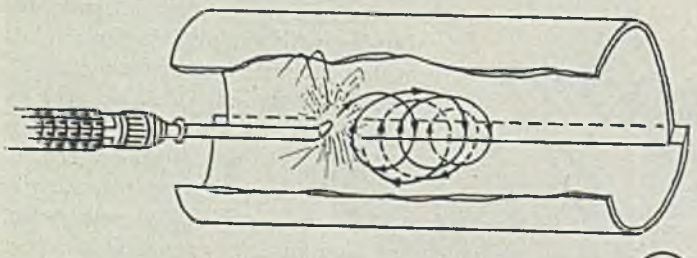
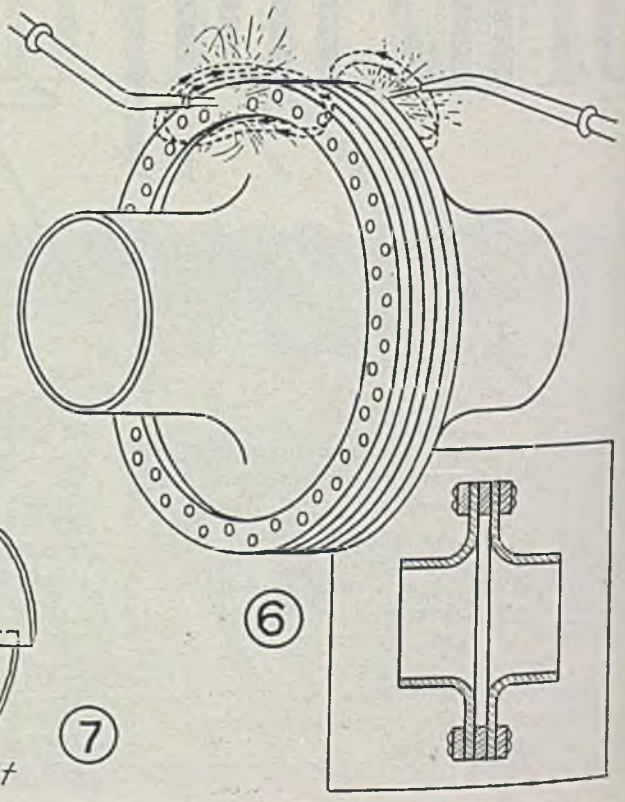
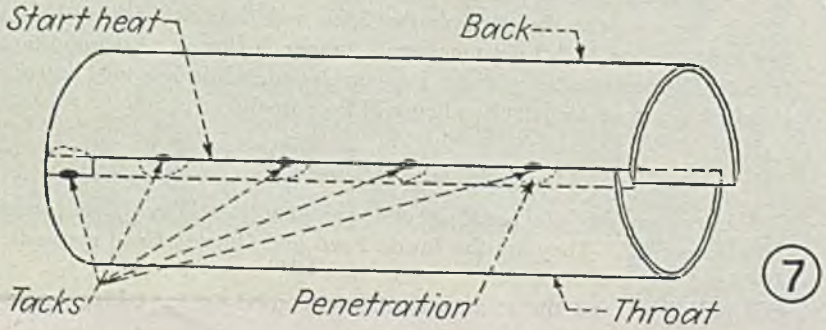


Fig. 4—Brazing a longitudinal seam in copper injection pipe







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lap the heat on the first braze by an inch or so at the center of the pipe. The alloy that was first applied should be brought up to melting temperature to insure a sound solid joint at this point.

—After completing the joint turn the pipe over and proceed in like manner with joint No. 2.

—After both seams have been completed, crack off the flux with the edge of a chisel, after which any grinding that is necessary may be done. It has been the general experience of those using this method that only a very small amount of grinding is necessary on a properly made joint.

Outside Feed:

—Prepare the pipe for brazing in the same manner as used for inside feed, then place a series of tacks at intervals of about 8 to 10 in. along the outside of the entire seam. When tacking be sure to concentrate the heat on the back of the pipe and flow the alloy well down into the joint.

—Start heating one tack in from either end of the pipe. (See Fig. 7). At first concentrate heat on the back of the pipe until the alloy flows. This tends to force the pipe together due to expansion and aids in making a good tight joint. After the alloy flows, concentrate the heat on the throat section of the joint and draw the alloy through with a sweeping motion. A helper should assist the brazing operator when using this method and should watch the inside of the pipe and advise when the alloy has flowed through the joint.

—Proceed along the entire length of the seam from tack to tack until completed. Then return to the starting point at the other end of the pipe and braze the last section from the first tack to the end of the pipe. Keep the torch constantly in motion to insure even heating and prevent overheating any one spot.

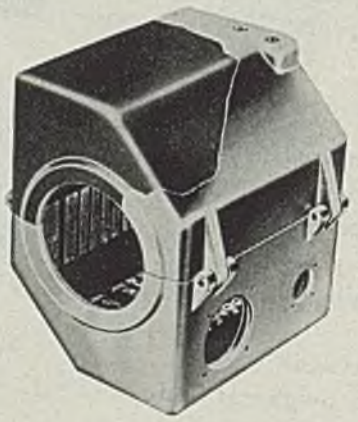
—When the first joint is completed, turn the pipe over and proceed in the same manner with seam No. 2.

Annealing Brazed Piping

A very ductile brazing alloy is needed —one which will stand more cold working than the average base metal alloy used for brazing.[1] However, with the low melting point of this alloy it is necessary to take a little extra care when annealing a brazed pipe. Regular annealing practice can be followed up to 1½ to 2 in. from the brazed joint. That is, anneal at a red heat throughout the pipe, except around the joint area. Care should be taken not to raise the joint itself above a temperature of about 1000°F or just a little beyond the point where the copper starts to show a black color. Joint areas annealed in this way can be worked satisfactorily. The amount of work they will stand between anneals is a little less than copper takes which has been annealed at a red heat.

Branch Outlets and Pipe Reduction

When making branch outlets, the metal should be heated as already mentioned, and after this section has been annealed the operator should *allow the joint to cool before commencing to hammer.* A common procedure is to anneal one joint and, while waiting for it to cool, anneal the joint on the other side of the branch. When this is completed, the first joint annealed has cooled enough to permit hammering. After hammering has been completed on the first joint, the second joint will be sufficiently cool to permit working.



METAL SHEATHED: Electroplating this molded plastic housing with copper and cadmium not only substantially raises its resistance to abrasion but also strengthens it. The work was done in plant of Metaplast Co., New York

In the event that the joint should break while hammering, it should immediately be cleaned, fluxed and rebrazed before any further work is done. Failure to rebraze at once will result in the joint spreading apart and result in uneven stretching of the copper. This will tend to reduce the actual joint area.

When it is necessary to reduce the size of the pipe on one end, as is required in high and low suction lines and in reductions to fit smaller flanges, the procedure is exactly the same as for branch outlets. Be sure, however, that the joint is not annealed at a red temperature, and do not work it while hot.

Branch Outlets and Flanges

Silver brazing alloys of the type described[1] are ideal materials for brazing branch outlets into pipes. Their physical characteristics permit working with poor tolerances and hammer fits.

Procedure:

After a branch has been properly trued up, it should be cleaned and thoroughly fluxed. The pipe to be inserted should also be cleaned and fluxed. After positioning, tack it at four places around the circumference.

When starting to heat, the entire branch should be preheated around the circumference, concentrating at first on the branch section coming from the main pipe. When this starts to show a black color the heat should be transferred to the cup section and raised nearly to temperature for brazing. The heat should then be transferred back and forth from the branch section to the cup section heating the entire shear area so that the alloy will melt and penetrate throughout the joint. When using silver brazing alloys, fillets are not necessary and it is recommended that the bell generally made at the top of the joint for brass be eliminated.

The strength and leak tightness of this type of joint is dependent upon the alloy that has penetrated into the shear area between the inserted pipe and the extruded branch.

Low Hub Flanges

The kind of brazing alloy discussed has proved itself for brazing low hub face feed steel or bronze flanges to fabricated copper pipe.

Procedure:

Careful cleaning and fluxing practices should be followed as mentioned before; and after the pipe and flange have been assembled, particular care should be taken in caulking the pipe so that it fits snugly against the flange as well as the tapered section on the bottom of the flange. On low hub flanges having a chamfered edge, it is recommended that this be reduced to a minimum as it is not necessary to fill in a heavy casting of alloy as is common practice with brass. If the pipe is 6 in. in diam or over, assemble the pipe and flange and tack in four places. It is recommended that the inside and outside of both pipe seams be fluxed for a distance of 3 or 4 in. above the hub of the flange.

Large flanges should be suitably supported on fire brick or table with asbestos surface, so that there will be no unequal stresses. This will reduce the danger of cracking the flange while heating.

The entire pipe first should be preheated to expand it into the flange.

Heat the pipe until it shows a black-

ish color denoting a temperature of about 800°F then transfer the heat to the face of the flange.

Where an alloy of lower silver—higher copper content[2] is used for brazing flanges, it is suggested if the joint on the fabricated copper pipe should melt adjacent to the flange that this be repaired with a brazing alloy similar to Sil-Fos Grade V alloy.

Brazing Circumferential Rings on Expansion Joints

Grade III in the latter alloy[2] has been recommended for brazing circumferential ring joints on expansion assemblies.

Procedure:

All members of the assembly *including the rivets* should be carefully cleaned and fluxed.

The entire assembly should be bolted together.

In replacing bolts with rivets, copper rivets should be used. It has been found best to remove about 3 bolts at a time when riveting.

After the rivets have been properly headed, the joint should be set in a holding device so that it is in a vertical position. At this point the entire area should again be fluxed.

Two men using oxyacetylene torches with No. 10 or 12 tips position themselves on either side of the joint. (See diagram Fig. 6). Taking a segment approximately 12 in. long, start the heating, concentrating on the brass circumferential ring. The torches should be swung in unison back and forth along this 12 in. section until it reaches brazing heat at which time the alloy[2] is applied to the top of the joint and run entirely through the assembly so that complete penetration shows on the outside ring, at which time it will also penetrate through the center ring. After completing a 12 in. section any inequalities on the surface are then filled in with surplus alloy.

After the first 12 in. section is completed the operators move on to another 12 in. segment overlapping the heating so as to get a complete bond between brazed sections.

The work progresses in this fashion, rotating the joint when necessary, until the entire assembly has been brazed.

It is most important to flow the alloy through the entire joint and through the rivets to insure absolute certainty of leak tightness.

It has been the experience of shipyards and copper shops using this method that if copper rivets are used they will remain snug and any small tolerances will be filled in by the brazing alloy.

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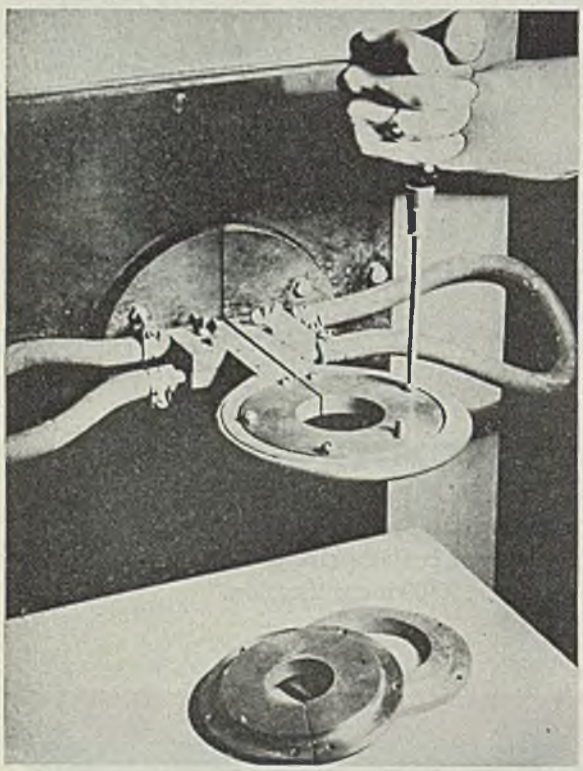
[1] Easy-Flo: Brazing alloy manufactured by Handy & Harman, New York 7. Available in several types and grades. Basic composition is silver, 50; copper, 15.5; zinc, 16.5; cadmium, 18; resists corrosion due to silver content. For brazing ferrous and nonferrous metals, particularly dissimilar ones.

[2] Sil-Fos: Brazing alloy also made by Handy & Harman. Available in several types or grades. Basic composition is silver, 15; copper, 80; phosphorus, 5. It is used to join nonferrous metals only and can be obtained in rods, wire, sheets and strips (coiled). It is corrosion resistant and has high ductility.



MASTER coil with removable, quickly-changeable inserts is expected to greatly alleviate the coil changing problem in setting up equipment for induction heating applications. Inserts will accommodate diameters ranging from ⅛ to 3 in. in small increments. Basic master coil consists of a rugged, water-cooled inductor block, machined to take inserts which go to make up coil, as illustrated.

Used with a Thermonic output transformer, coil gives in effect a single-turn inductor block of variable inside diameters. Inserts can be of any desired thickness, making coils capable of heating axial bands of various widths to produce heat patterns possible with induction heating. Inserts are held in place by easily removable screws, cooling by thermal conduction from master coil. They may be used in multiples, thus offering flexibility of many different coils of unusual contour.

ADJUSTABLE

Induction Heating Coils

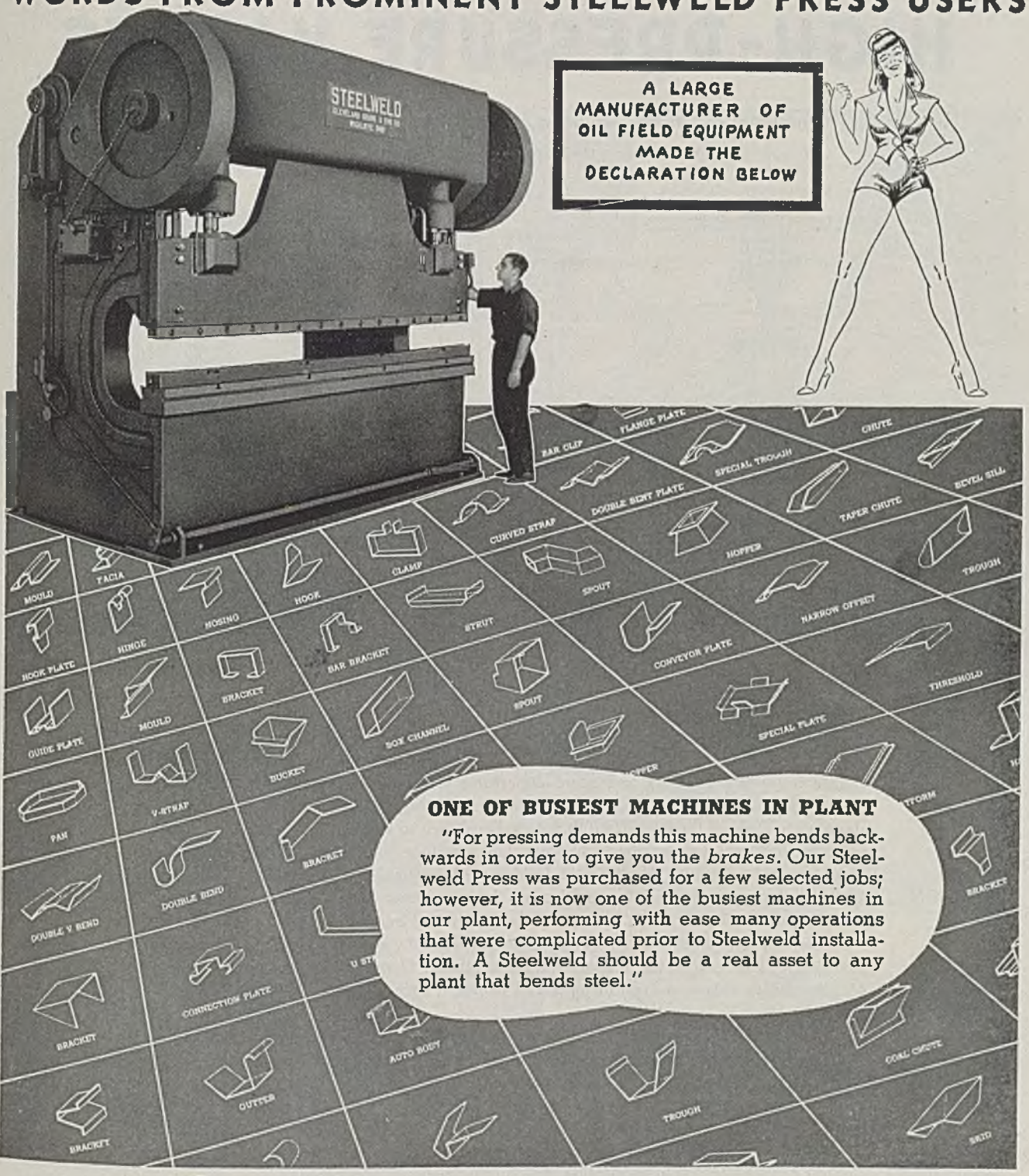
Experimental work facilitated by removable inserts which largely eliminate coil changing in setting up induction heating equipment

Master coil lends itself to experimental work involved in designing a production coil for a given application. Procedure is simply to choose inserts apparently best suited for application and determine size and shape giving desired results. A production coil then can be fabricated following the dimensions of the master coil, making it available for further experimental work. This procedure fits in the general reconversion problem, as plants using induction heating are anxious to determine its adaptability to peacetime products and production.

Although master coil is designed for experimental work, it is constructed so that it can take abuse inherent to production runs. Standard Thermonic master coil set shown here, a product of Induction Heating Corp., consists of two master coils and 48 inserts contained in a specially constructed wood chest which permits coils and inserts to be readily accessible.

Smaller master coil, with 27 inserts, accommodates round stock ranging from ⅛ to 1¼ in., with inserts of three thicknesses for each diameter—⅛, ¼ and ½-in. Larger master coil, with 21 inserts, takes stock ranging from 1½ to 3 in., with inserts in same thicknesses as far as smaller coil. Blank inserts permit user to cut desired contour to match the particular work, with special inserts furnished on order.

WORDS FROM PROMINENT STEELWELD PRESS USERS



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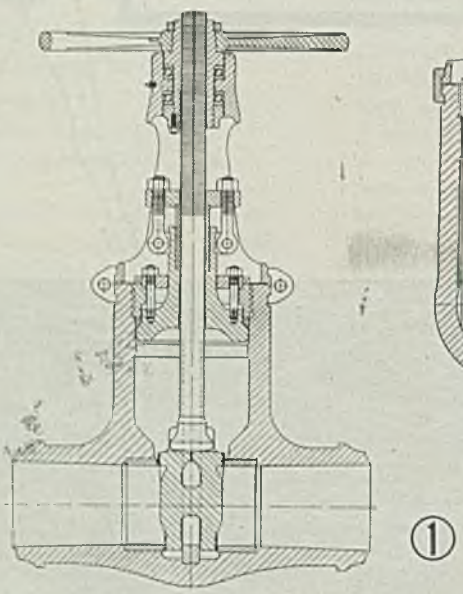
HIGH-PRESSURE VALVES

. . . pointed at improving pressure-seal bonnet joints, reducing weight, aiding disassembly



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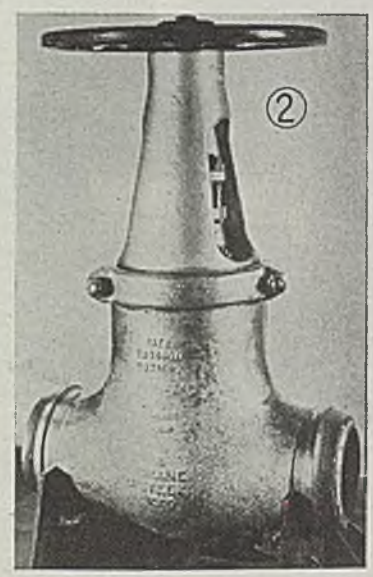

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VALVES designed for high pressure, high temperature steam service, primarily in the 1500 lb and 900 lb pressure classes, with welding ends, and embracing gate, globe and angle, and automatic stop-check valves, and said to incorporate important changes and some departures from previous conventional types of construction are being produced by Crane Co., Chicago. Sectional view, Fig. 1, is a drawing to scale of the 8-in. 1500 lb gate valve shown in Fig. 2.

Pressure-seal bonnet joint, an important advance in design, utilizes pressure in valve to seal joint and to eliminate leakage. Maintenance is reduced to a minimum because there is no need for pulling up bonnet joints by re-stressing studs, either initially or periodically, as in the case of flanged bolted bonnet joints.

Inspections of the interior of valves is expedited by ease with which the pressure-seal bonnet joint can be taken apart and reassembled. Considerably less time is required to disassemble this new type of joint and to put it together again than for any bolted flanged joint.

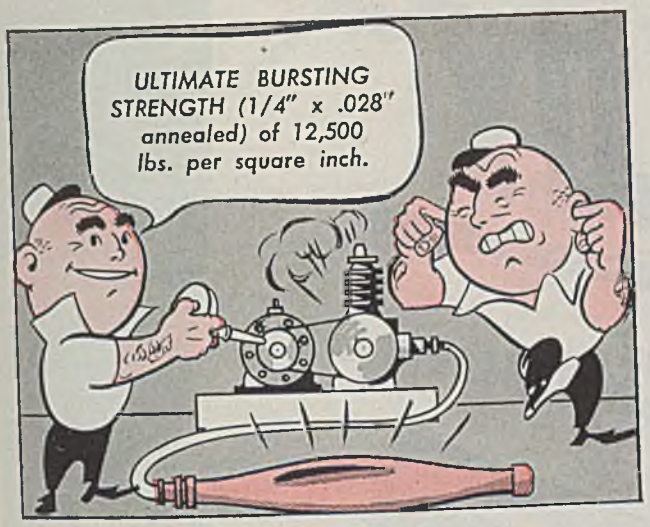
Reduction in weight of 1500 lb pressure-seal bonnet valves, for example, varies from approximately 40 to 60 per cent, according to size, when compared with conventional bolted bonnet valves of similar types. New design also permits an appreciable saving in space due to elimination of heavy flanges and resultant compactness and shorter end to end dimensions. Reductions in weight are accomplished without any sacrifice in strength. Less weight means that valves are easier to handle in erection and savings can be effected in supporting structure or suspension of piping.

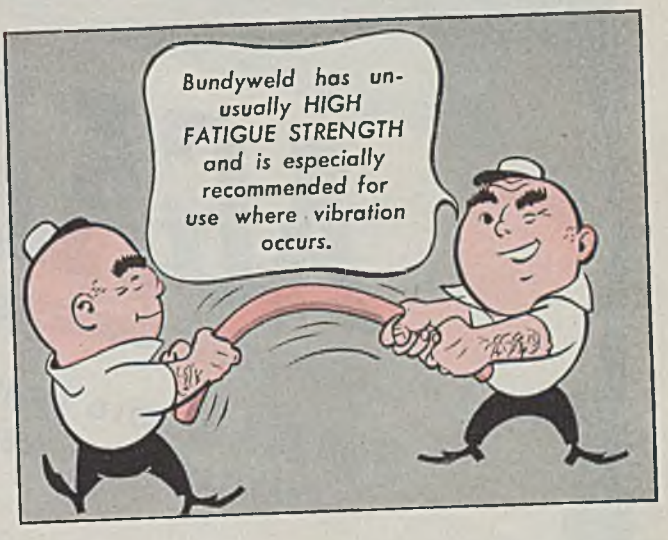
Application of insulation is made easier due to streamlined design and particularly because the bulky flanged bonnet joint is eliminated. Less insulating material and labor are required and a neater appearance is achieved.

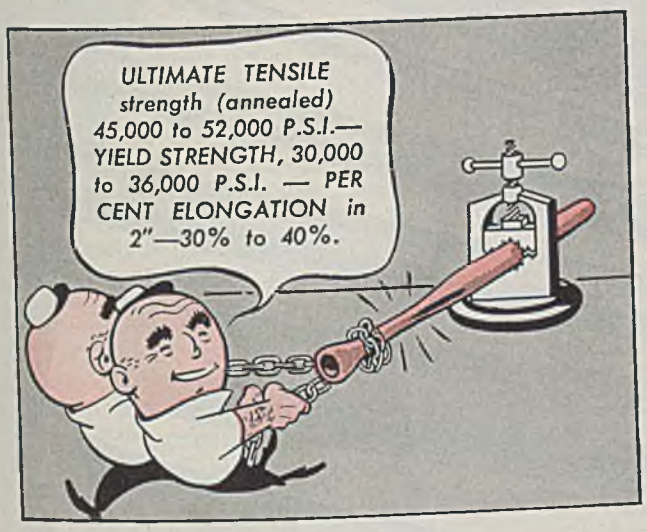
Disk for the gate valves has built-in flexibility that eliminates sticking and requires less torque for opening when valve is cold after having been closed while hot. Disks have Stellite facings. Design of gate valves insures proper guiding of disk for full length of travel on close fitting machined guide. Unique construction permits more compact design of valve body.

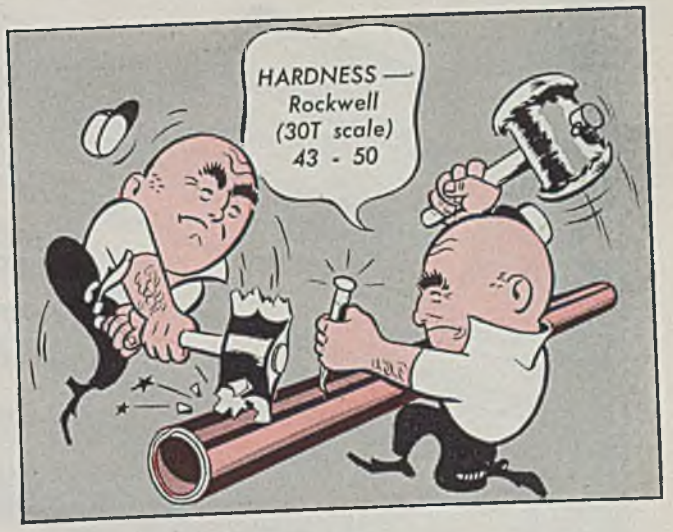
Body rings also are of a new design that permits straight line flow with minimum friction, and are seal-welded in place and Stellite faced. A simple clamp, in sizes 8 in. and larger, eliminates the conventional type of construction which involves bolting yoke to body. Yoke is made integral with retaining ring in sizes 6-in. and smaller.

BUNDYWELD can take it









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Chromium Plating

On Copper, Nickel and Steel

Study reveals that commercial methods of surface preparation of these metals is adequate if certain factors are observed. In covering copper a preference was given to a pre-dip in sodium cyanide or a flash deposit of nickel; the widest bright range was attained for nickel and steel by the complete removal of oxide and other interfering films

DISCUSSION of procedure and results of an investigation of surface preparation for chromium plating of copper, nickel and steel is presented in paper 88-28 prepared for the Electrochemical Society by William M. Tucker, chemist, and Robert L. Flint, formerly junior chemist, Eastman Kodak Co., Rochester, N. Y. The Hull cell was utilized as a quantitative device in a re-study of the reluctance of certain cathodes to accept a chromium deposit, results of excellent reproducibility were obtained. It was concluded that the commercial methods of surface preparation evolved since the inception of chromium plating were adequate if certain limiting factors were duly considered.

It was observed that neither copper nor steel were acutely sensitive to methods of surface preparation. A slight preference in covering copper could be given to a pre-dip in sodium cyanide or to a flash deposit of nickel. Steel could be anodically processed to some advantage in chromic acid, sulphuric acid, or a mixture of the two. Nickel cathodes demonstrated a greater sensitivity and could be very advantageously prepared for plating by immersion in 5.8 N HCl (1:1 by volume) or in 5.8 N H_2SO_4 (300 g/L H_2SO_4). With the exception of copper, the chief factors involved in attaining the widest bright range entailed the complete removal of oxide and other interfering films from the cathode surface, followed by immediate chromium plating, utilizing precautions designed to prevent reforming of such interfering surface films from contact with atmospheric or dissolved oxygen and chromic acid electrolyte.

This study of the surface preparation for chromium plating of copper, nickel and steel indicated that the list of factors involved are essentially as follows:

(1) Preplating removal or substantially complete removal of interfering films, generally thought to be oxides.

(2) Rate of repair of these interfering films (normal for the metal in the media of exposure, i. e., water, air, etc.) during the time intervening between surface preparation and start of plating.

(3) Rate of formation in the plating bath of interfering chemical films presumed to be chromates or possibly oxides of either chromium or the basis metal.

(4) Rate of solution of the basis metal and its oxide or other chemical film in the chromium plating bath.

(5) Instantaneous current density on the more active portions of the cathode and the relationship thereof to the formation of a chromium metal deposit having a crystal structure capable of essentially specular reflectivity.

(6) A definite concentration effect with regard to the true current density resulting from the observed fact that, at the initiation of plating, gas evolution always began at the high current density end of the Hull cell plate. The interface of gas evolution and the times required for gas evolution to come to equilibrium across the cathodes were variable and not of constant behavior except when the cathodes had been prepared so as to cover with chromium to the maximum degree.

(7) As has been demonstrated by others, the sulphate ion in a highly acid environment possessed a specific and benevolent effect. Data obtained by the authors indicated sulphate ion preparation in the presence of a high concentration of hydrogen ion to be as efficient as chloride ion in a similar environment and less subject to rapid deterioration.

(8) The three metals investigated behaved individually as would be expected. However, from a practical aspect copper and steel behaved similarly in that, provided the cathode was free of grease, oils, etc., very little could be done either to narrow or widen the bright plating range. This was not the case with nickel since a choice of an improper method of cleaning or an accidentally long exposure to the chromium plating bath without current flowing could markedly reduce the width of bright plating range. Conversely, a choice of an ideal cycle of surface preparation (capable of removing oxide and other interfering films) yielded deposits characterized by a bright plating range of unusual width

In brief, the practical operator must expect to use special precautions in the preparing of nickel for chromium plating. An unmentioned but practical approach would be to prevent nickel deposits from filming as much as possible prior to preparation for plating. Low buffing temperatures, quick processing of buffed work, utilization of nickel plating baths giving deposits requiring a minimum of buffing, etc., would be practical steps capable of minimizing difficulties with coverage. However, it would be even more practical to incorporate into every chromium plating-over-nickel cycle one of the preferred preparatory steps which can remove oxide and other interfering films residual after alkaline cleaning processes. Although bright nickel deposits were not studied, the general considerations involved would warrant at least the suggestion that similar preparatory steps be utilized.

Results of the investigation are summarized by the authors as follows:

A. Buffed copper and cold-rolled

steel, free of greases and oils, normally accepted chromium deposits of a satisfactory nature. Buffed nickel, similarly prepared, required special processing to obtain equally good results.

B. Some cleaning methods utilizing abrasion or electrolysis were not efficient in preparing nickel cathode surfaces and, in specific cases, these methods actually retarded chromium coverage.

C. Copper could not be covered with chromium at as low a current density as nickel or steel except by overplating with a thin layer of nickel from a low efficiency chloride electrolyte.

D. Nickel surfaces were most efficiently prepared by an immersion of at least 2 min or a short cathode treatment at 25° C in 5.8 *N* H_2SO_4 (300g/L H_2SO_4) or by an adequate immersion in 5.8 *N* HCl (1:1 by volume) at 25° C. Anodic polishing in phosphoric-sulphuric electrolyte was almost as effective. Cathodic treatment in 45 g/L NaCN, 15 g/L Na_2CO_3 at 25° C was adequately effective and did a reasonably good cleaning job simultaneously.

E. Steel could be advantageously prepared by subjecting it to anodic treatment in a chromium plating bath or to anodic treatment in sulphuric acid with or without chromic acid. Anodic treatment in 1 *N* H_2SO_4 between 25° C and 50° C was most effective.

F. Conventional modern methods of surface preparation prior to chromium plating were generally adequate for copper, nickel and steel, provided the operator exposed the work during cleaning for a sufficient length of time.

G. The general technique involved in the special preparatory steps appeared to provide for the substantially complete removal of any oxide or other interfering film, followed by suitably timed manipulative steps designed to initiate chromium plating before any interfering films could form.

H. The effectiveness of the sulphate ion in an environment of high hydrogen ion concentration as an oxide and interfering film solvent was further confirmed.

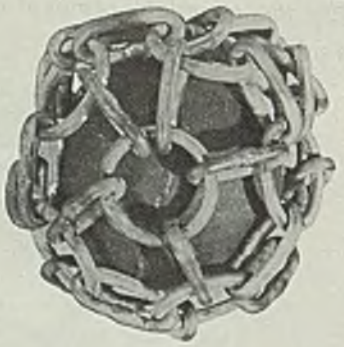
I. The conclusion of Haring and Barrows (H. E. Haring and W. P. Barrows, "Electrodeposition of Chromium from Chromic Acid Baths," p. 436-7, Technological Papers, Bureau of Standards, 1927.) and others that a maximum effect in the deterioration of the bright plating range occurred at the high current density limit when interfering films began to reform on the cathode surface was well confirmed.

J The Hull cell, when utilized with great care, was found to be capable of providing quantitative data with respect to the behavior of both differently prepared cathodes and variations in the chromium electrolyte proper.

—o—

PIPE CRAWLER

. . . made up of Neoprene ball enclosed in harness of chain that is carried along by pump pressure in line



CLEANING the inside of water mains and oil pipe lines is now carried out speedily and economically by means of a unique, efficient piece of equipment known as the rotary pipe crawler. This "Go-Devil," as it is called, comprises a Neoprene ball, hollow or solid, which is enclosed in a mesh-like harness of heavy chain. In water mains, it removes scaly deposits from inside of pipe walls; in oil pipe lines, it scrapes away paraffin.

To clean water mains or pipe lines, rotary crawler made by Corona Sheet Metal Works, Corona, Calif., is inserted directly into the line. Pump pressure in line imparts a forward rotating motion to Neoprene ball. Thus the crawler is forced through the line and in its passage, scrapes off deposits from inside of pipe. Top deposits are best removed by using an air-filled Neoprene ball, and for bottom deposits, a water-filled ball. Because Neoprene ball is compressible, crawler will pass through flattened sections of pipe and follow changes in contour along the line.

Crawler ball shown in accompanying illustration is made of Neoprene, which is sufficiently tough to withstand severe mechanical abrasion. Neoprene also possesses necessary oil resistance to withstand constant contact with oils when crawler is used in an oil pipe line.

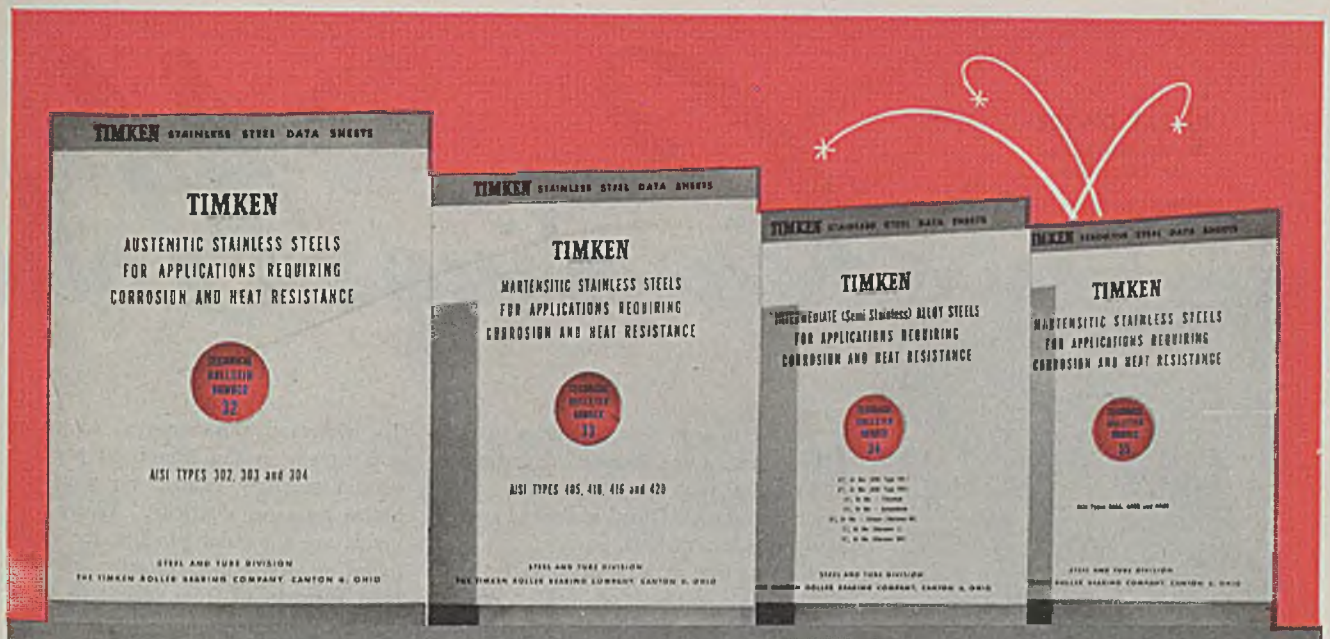
Efficiency of design and construction of rotary pipe crawler was demonstrated in cleaning of a 20 in. water main which was 12,800 ft long. This 20 in. penstock, which supplied water to a hydro-electric power plant, was cleaned by four men in 7 days using a 19½ in. hollow crawler. With more experience, the job might have been done in only 2 or 3 days.

To insure thorough cleaning, crawler, two-thirds full of water, was run through the entire line four times. Then, filled with air only, it was put through four more times. On normal runs, it moved at good speed; through certain sections at about 24 mph. Entire run through line was made in times varying from 30 to 46 min. After cleaning, friction head loss was reduced from 35.4 ft per thousand feet of line to 16.3 ft and peak load capacity of plant was brought up from 990 kw to 1250 kw, the original peak.

After two trips through the line, harness catches of original chain were worn out by abrasion and had to be replaced with links of ¼-in. welding rod. Chain also had to be patched after each of the later runs, and at end of job, was completely worn out. Hollow Neoprene ball came through in excellent condition and was considered by operators to be almost as good as new.

For high pressure oil lines, a solid Neoprene core is used. Originally designed for large pipe sizes, 2 and 3 in. crawlers now are being used successfully for paraffin scraping of various types of small oil lines.

Described by Engineering Products Co., Los Angeles, as the first universal cylinders to be developed, that firm's standardized cylinder can be operated by air, oil or water. It is available in diameters and stroke lengths that meet practically all heavy-duty requirements.



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By PAT DWYER
Engineering Editor
The FOUNDRY

Casting Molds for Small Billets

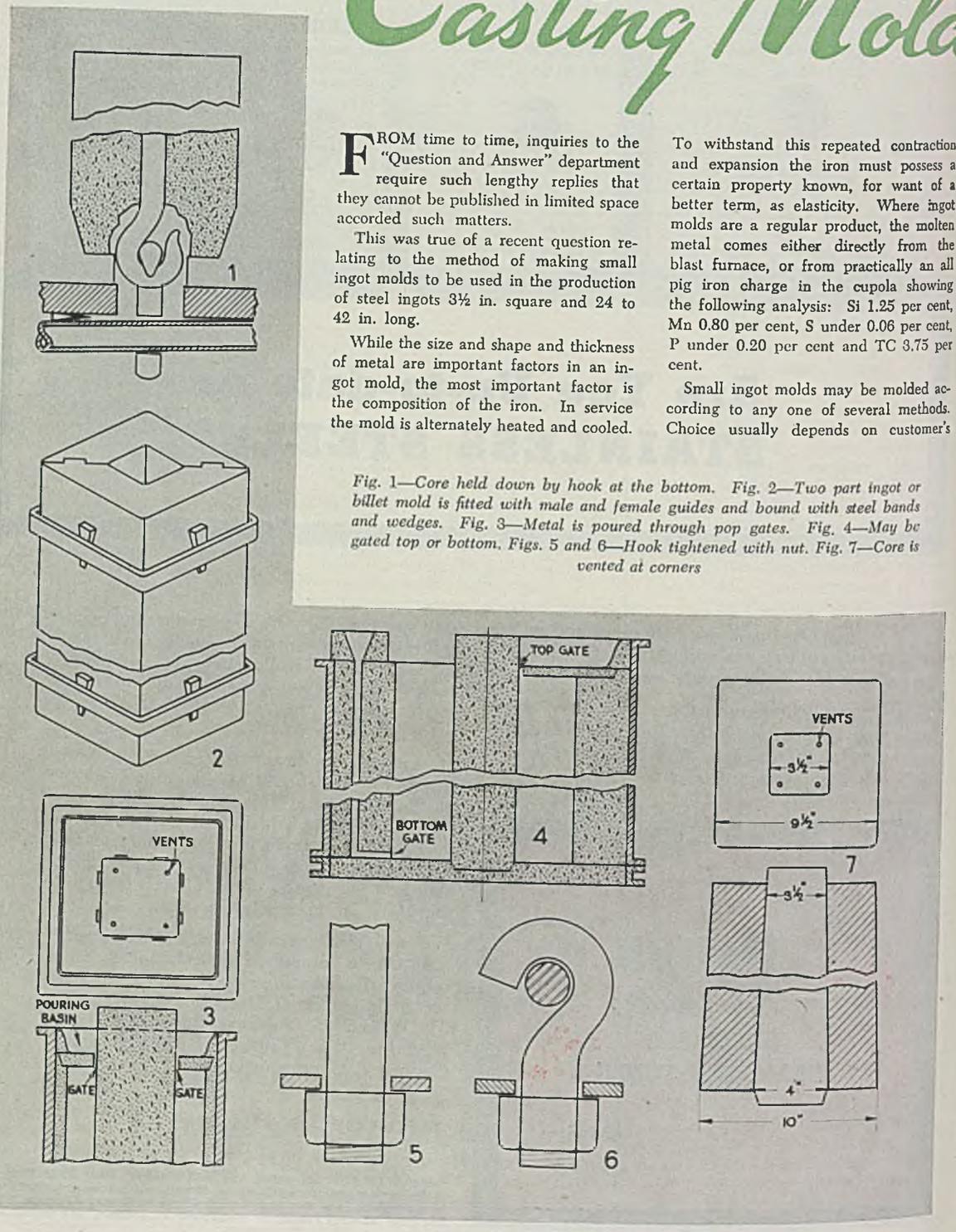
FROM time to time, inquiries to the "Question and Answer" department require such lengthy replies that they cannot be published in limited space accorded such matters.

This was true of a recent question relating to the method of making small ingot molds to be used in the production of steel ingots 3½ in. square and 24 to 42 in. long.

While the size and shape and thickness of metal are important factors in an ingot mold, the most important factor is the composition of the iron. In service the mold is alternately heated and cooled. To withstand this repeated contraction and expansion the iron must possess a certain property known, for want of a better term, as elasticity. Where ingot molds are a regular product, the molten metal comes either directly from the blast furnace, or from practically an all pig iron charge in the cupola showing the following analysis: Si 1.25 per cent, Mn 0.80 per cent, S under 0.06 per cent, P under 0.20 per cent and TC 3.75 per cent.

Small ingot molds may be molded according to any one of several methods. Choice usually depends on customer's personal preference for a split or a solid mold. In the split mold the joint is at two diagonally opposite corners and the halves, provided with longitudinal male and female joints, are matched, set up and held in place by square ring clamps and wedges, as shown in Fig. 2. The pattern for each half is molded face down to leave its own core. The core is vented by one or two long rods pulled through the end of the flask before the pattern is drawn. A coating of plumbago is brushed on the core to impart a smooth face to the casting. Metal from a single sprue enters the mold through two gates at one end so that the core is covered evenly from both sides. Incidentally, the flask ends are cut to correspond closely to the shape of the pattern.

Fig. 1—Core held down by hook at the bottom. Fig. 2—Two part ingot or billet mold is fitted with male and female guides and bound with steel bands and wedges. Fig. 3—Metal is poured through pop gates. Fig. 4—May be gated top or bottom. Figs. 5 and 6—Hook tightened with nut. Fig. 7—Core is vented at corners



Difference in Density

One objection to split molds and to solid molds cast horizontally, is that there usually is a slight difference in the density of the metal on the upper and lower members. This lack of homogeneity may shorten the active life of the mold. The solid mold may be molded and cast horizontally or vertically, but the vertical method most nearly meets theoretical requirements. All large molds are cast in a vertical position. Where the mold is made horizontally, the pattern is provided with a core print at each end. The core may carry its own prints to fill the gaps at either end, or small block stop-off cores may be placed in position after the main core is lowered into place in the mold.

A stiff steel bar is placed in the center of the core to prevent it from springing when the mold is filled with metal. The inside face of the casting must be clean and absolutely straight. No chaplet is allowed.

The best method of making the casting is to pour it while in a vertical position. The mold may be made either horizontally or vertically and may be gated either at the bottom, as in orthodox ingot making practice, or on top as in pipe making practice. The core is tapered from 3½ in. at the top to 3¾ in. at the bottom. Since the pattern is tapered to correspond, the main part of the mold is made in the cheek part of the flask which is lifted off and turned over for extraction of the pattern. The drag face is perfectly flat with a depression in the center to serve as a core print. The core is anchored in place by a hook extending through a hole in the bottom board or plate and tightened by a rod and wedge, as shown in Fig. 1, or by other methods which are illustrated in Figs. 5, 6, 8 and 9.

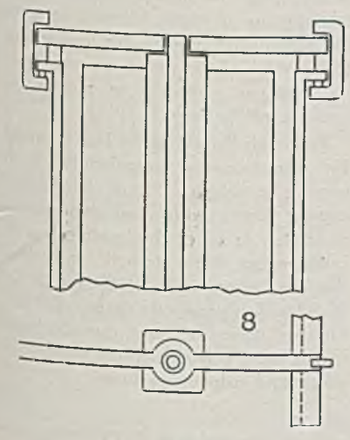
If the customer has no objection to a more or less rough top, the metal may be poured directly into the open top of the mold. Otherwise the top of the mold is covered by a cake core sitting in a suitable print. A large opening in the center of the covering core holds the square body core accurately in position. A number of small pop gates close to the center core allow the metal to slide down without touching the green sand mold face. The gates are fed by a suitable pouring basin.

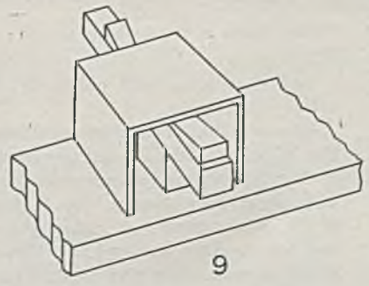
Pour Metal Through Cup

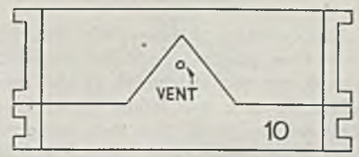
When the time comes to pour steel into the ingot molds it is advisable to use a pouring cup, particularly if the steel is poured through a nozzle in the bottom of the ladle. No trouble will be experienced with a clean stream, but occasionally with a leaking stopper or a nozzle not spotted accurately, the metal will spatter over the top of the mold and cause considerable trouble in removing the ingot.

In some plants the core arbor and base plate are handled as a unit. In other plants the base and core arbor are assembled and taken apart each time a casting is made. A recess in the base is filled with a flat dry sand core, or with green sand rammed and skin dried. Usually there is sufficient heat in the

Figs. 8 and 9—Center core is held in place by bar laid across the top, with the ends wedged in pockets attached to upper flange of the flask. Fig. 10—The half ingot mold is cast in a flask with special ends







base to dry this thin body of sand. The object is to provide a sand face for the first metal entering the mold. Molds and cores are dried according to several methods. In one the jackets and cores are loaded on cars and placed in an oven. In other places the cores are dried in an oven, but the jackets are set up on a battery of stands bearing a close resemblance to the great masterpiece turned out by Chic Sale's rural builder. A coke fire or gas jet in each unit quickly dries the sand in the jacket. In another installation the jackets are loaded on cars and placed in an oven, while the cores are suspended by the necks in another oven. In the steel mills, the ingot molds rest on thick cast iron stools, either on the floor or mounted on buggies in a train that regularly passes under a stationary ladle.

Designs Steel Lugs

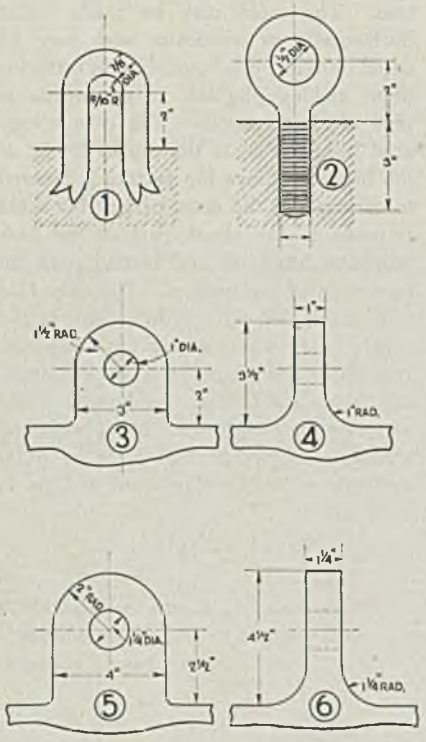
for blast furnace cooling plates

WHEN attempting to remove copper cooling plates from a blast furnace, it is sometimes found that the lugs provided for the purpose fail in various ways, especially if the plates have been in the furnace for a great length of time, thereby causing considerable inconvenience and sometimes necessitating leaving a dry cooler in the furnace.

With a view to designing a more satisfactory fitting, a series of experiments were carried out by the Cargo Fleet Iron Co., Ltd., Middlesbrough, in collaboration with the Reay Brass Foundry Co., Ltd., Stockton-on-Tees, England. In these experiments it was borne in mind that the ultimate limiting factor lies in the strength of the drawing tackle. Since this tackle has to be readily portable, and suitable for use at times in locations difficult of access, it must not be heavy or of large dimensions.. Experiments were therefore directed to producing a lug capable of withstanding a direct pull of about 25 tons.

Four patterns of lug were examined, two sizes of the normal lug cast integrally with the cooler; a U—bolt of ⅞-in nickel-chromium steel cast into the copper; and an eye-bolt of 1-in diameter steel tapped into the copper. The dimensions of these fittings are shown in Figs. 1and 2. In the case of the U—bolt (Fig. 1) the fitment was attached to an ordinary 100-ton tensile testing machine by means of forged heat-treated shackles made up from 1-in diameter bar, and coupled up with 1-in diameter machined bolts. On reaching a load of 29 tons failure of the shackle took place. There was no sign of stretch on the U-bolt or of the latter tending to tear out of the copper.

Two samples of the eyebolt (Fig. 2) were then tested using a forged machined double-eye for attachment to the machine. In each case failure of the eyebolt occurred at 25 tons, there being no sign of any tendency to strip the threads out of the copper. It was therefore considered that either of these two patterns could be readily developd to give any reasonable breaking strain, and attention was concentrated on the normal cast-on type of lug. Two samples of the smaller type of lug (Figs. 3 and 4) were tested, the first sample breaking open at each side of the hole after considerable stretching had occurred, at a load of 19 tons. The second sample failed prematurely at



Various types of lug patterns tested

a load of 9 tons, with practically no stretch at all.

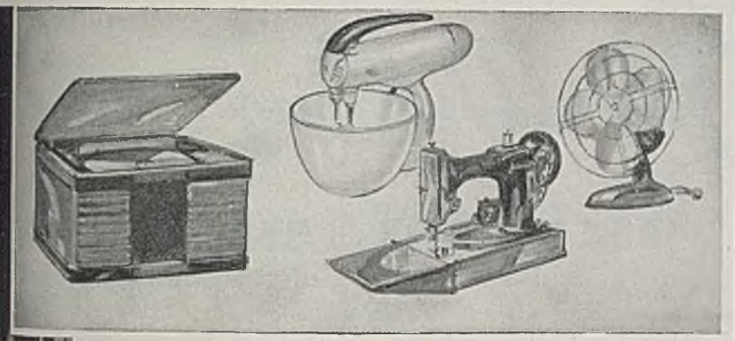
An examination of the fractures showed that whereas in the 19-ton sample the fracture showed no macroporosity and only slight microporosity, the fracture of the 9-ton sample was visibly porous, and the structure was typical of "overpoled" copper. There was no significant difference in the chemical analysis of the copper. It was considered that the premature failures encountered in the practical use of these fitments were due to occasional manufacturing irregularities of the above nature which may not be possible to elminate entirely. It was therefore necessary to design a lug of such strength that the weakest member of a batch would give the necessary minimum breaking strain.

Four lugs as shown in Figs. 5 and 6 were tested for this purpose. It was found necessary to strengthen the attachments again, the new fittings being machined from 4-in billet, and 1¼-in machined bolts used to couple up. Three of these fitments failed at 43, 42.8 and 40.2 tons respectively, over 1½ in of stretch taking place before failure. The fourth sample failed at 24 tons, the fracture showing similar porosity to the poorer specimen (Figs. 3 and 4). It was considered that this type of lug would prove satisfactory in use, as it would be difficult to employ drawing gear of greater weight and strength than that used to destroy these lugs, when working under the inconvenient conditions usually prevailing round a blast furnace. The experiments also pointed to the need for great care in obtaining the right conditions in the manufacture of these fitments, as porosity which would perhaps not been serious to the value of the cooler as such, would be sufficient seriously to reduce the strength of the lugs.

Premature failure of the lugs is caused by manufacturing irregularities. It is possible to design a lug of the standard cast-on pattern with a sufficient margin of stretch to cover this contingency. In cases where high strength is desired, this can be provided by the use of the steel fitments previously suggested. These fitments, however, have the disadvantage of rapid corrosion in the presence of water and sulphurous fumes.

(From *Iron and Coal Trades Review*, London.)

DRAWN FOR JONES & LAUGHLIN STEEL CORPORATION BY ORISON MAC PHERSON



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Your new electric kitchen sink will contain an automatic dishwasher. It will clean dishes, pots and pans with high-velocity jets of soapy water, then rinse and dry them. Some of the sinks contain garbage disposal unit that grinds table waste, washes it down drain, then scalds itself clean. No more messy garbage to "take out," no more dishpan hands, when you use this sink, many parts of which are made of J&L Cold Finished Steel bars and special shapes.

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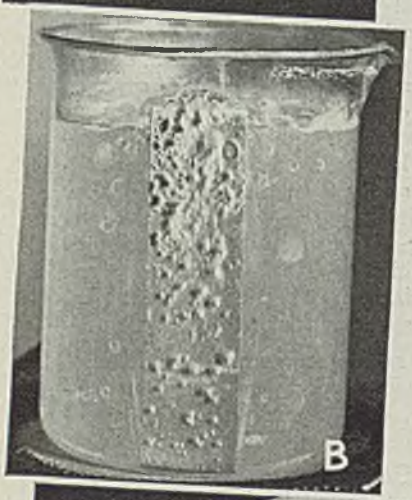
Your new sewing machine will have several improvements designed to make your sewing easier, give your dresses, your children's clothes, drapes, and slip covers that "professional" look. The new cabinets are available in period or modern styles to match your furniture. One portable model weighs only eleven pounds. Several important parts of sewing machines are made of J&L Cold Finished bars and special shapes.

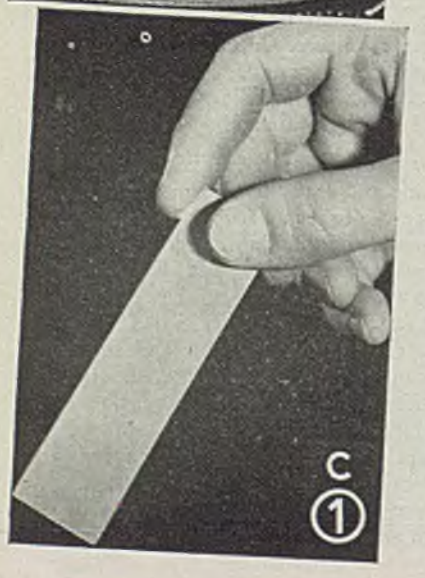
Your new washer has been given a great deal of time and study by design engineers to produce the best in both automatic and conventional type machines. With an automatic you put in clothes, set dials, add soap. The washer fills itself, tumbles clothes clean, rinses them thoroughly, spins them dry, then cleans itself, empties and shuts off. It can be installed in kitchen with clothes drier to match. New conventional washers have improved wringer controls, others spin clothes dry, one can be converted into dishwasher. Many parts of washers are of improved J&L Cold Finished bars and special shapes.

By B. B. BUTTON
Manager
Metal Industries Department
Diversey Corp.
Chicago

Pre-Welding TREATMENT for ALUMINUM

. . . . cuts contact resistance thereby greatly improving quality and quantity of spot welds; also prolongs life of electrode tips and eliminates need for tedious and expensive mechanical cleaning methods





CERTAIN aluminum alloys such as 17S, 24S, Alclad 24ST, 52S, 53S, 61S-W, 61S-T are usually received in the spot welding department with a rather heavy coating of oxide on the surface. While it is possible to spot weld sheet with such a coating, the results are erratic and far from satisfactory.

The factors responsible for the unsatisfactory welds can be divided into two principal divisions: First, aluminum and aluminum alloys have comparatively high thermal conductivity. This means that to make a good spot weld in such material, the metal at the interfaces (where the two sheets being joined contact one another) must be heated to welding temperature so rapidly that the heat will not dissipate to the surrounding metal and be lost before a weld can be made. This, in turn, requires extremely large currents be put through the work in order to develop heat at the desired rate.

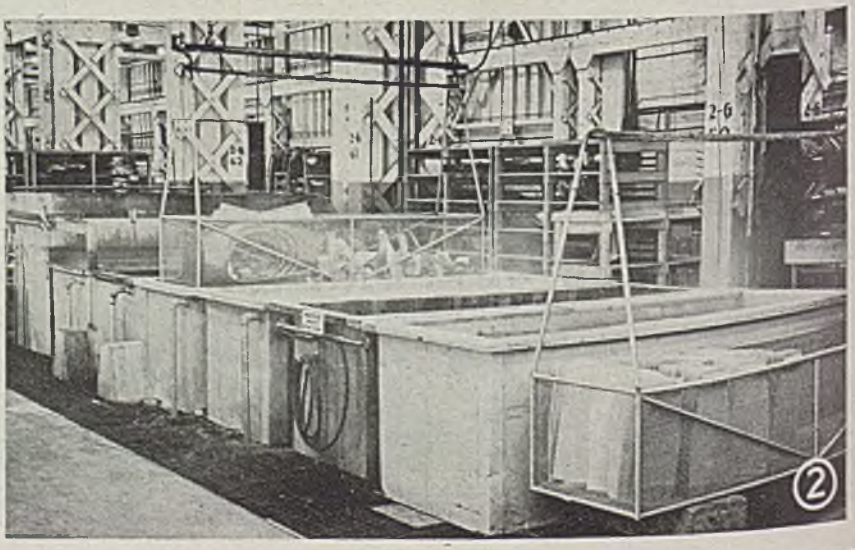
But large welding currents can only put through the work when the electrical resistance is low. Compared to the conductivity of the aluminum itself, which is comparatively high, the surface oxide layer has much less conductivity, resulting in a possible loss of power and the production of inferior welds.

Second factor is that such oxide layers may have a resistance that varies considerably from point to point. This can cause "spitting" by forcing most of the welding current to traverse only a portion of the contacted area, thus overheating that portion to a point where it becomes molten and is expelled from the surface, forming pits and thus damaging the surface as well as producing an inferior weld.

Then, too, any variation in current from the optimum conditions set up to make the welds will be sure to produce welds of inferior quality. Excessive

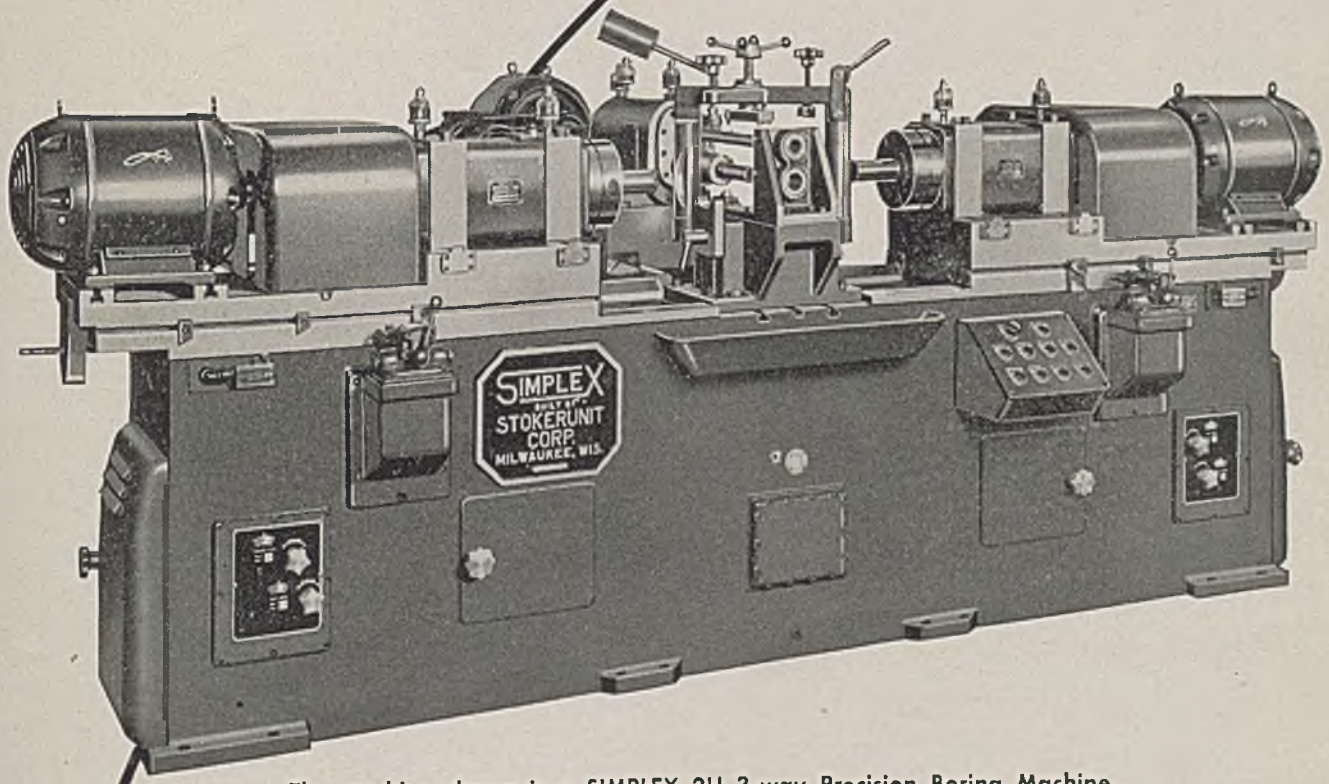
Fig. 1—Cleaner effectively removes marking inks from aluminum surfaces as indicated in this series of before and after views. Diversey Corp. photos

Fig. 2—Setup at one of Douglas Aircraft Co. plants for cleaning aluminum and aluminum alloy sheet by the Diversey process. Douglas photo



SIMPLEX

To get the most in precision and production, it is usually necessary to do all of the key operations at one setting of the work by the use of multiple spindles which can operate simultaneously or in close succession. The time element is reduced to a practical minimum — high production is maintained with low operator fatigue.



The machine shown is a SIMPLEX 2U 3-way Precision Boring Machine equipped with quick-clamping fixture for loading an opposed cylinder block and crank case while boring two cylinders, the crank shaft hole and the cam shaft hole. This insures accuracy of location and squareness of the important elements of the engine, at the same time providing a high production rate with a saving of labor and space.

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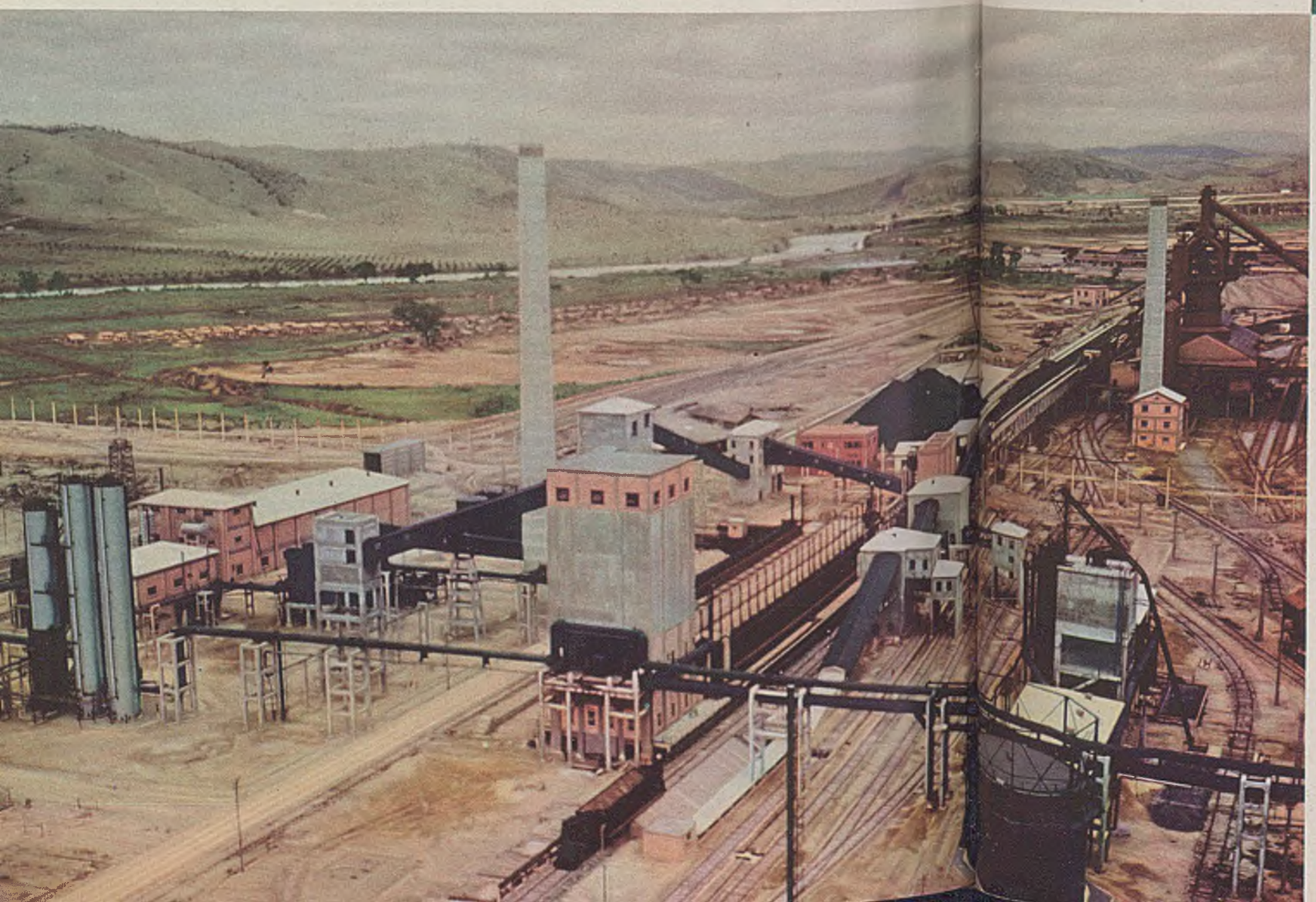

Koppers-Becker Underjet Coke-Ovens with Waste-Gas Recirculation and Koppers Byproduct Plant at Volta Redonda, Brazil.

This is the coke-oven plant of the Brazilian National Steel Corporation at Volta Redonda.

Brazil is a nation of 44,000,000 people. It occupies almost half the land area of South America. Yet it consumes only 350,000 metric tons of steel a year, which is less than the city of St. Louis uses a year.

This plant will make it possible for South Americans to use more steel. If they get into the habit of using more steel, they can create a tremendous market far beyond the capacity of South American plants to fill.

This coke-oven plant contains 55 Koppers-Becker Underjet Ovens with Waste-Gas Recirculation, as well as a complete byproduct plant, three Koppers-Kerpely Gas Producers and a tar-distillation plant. The coke-oven plant has the capacity to carbonize 570,000 tons of coal a year, and the tar plant can process 5,480,000 United States gallons of tar per year.

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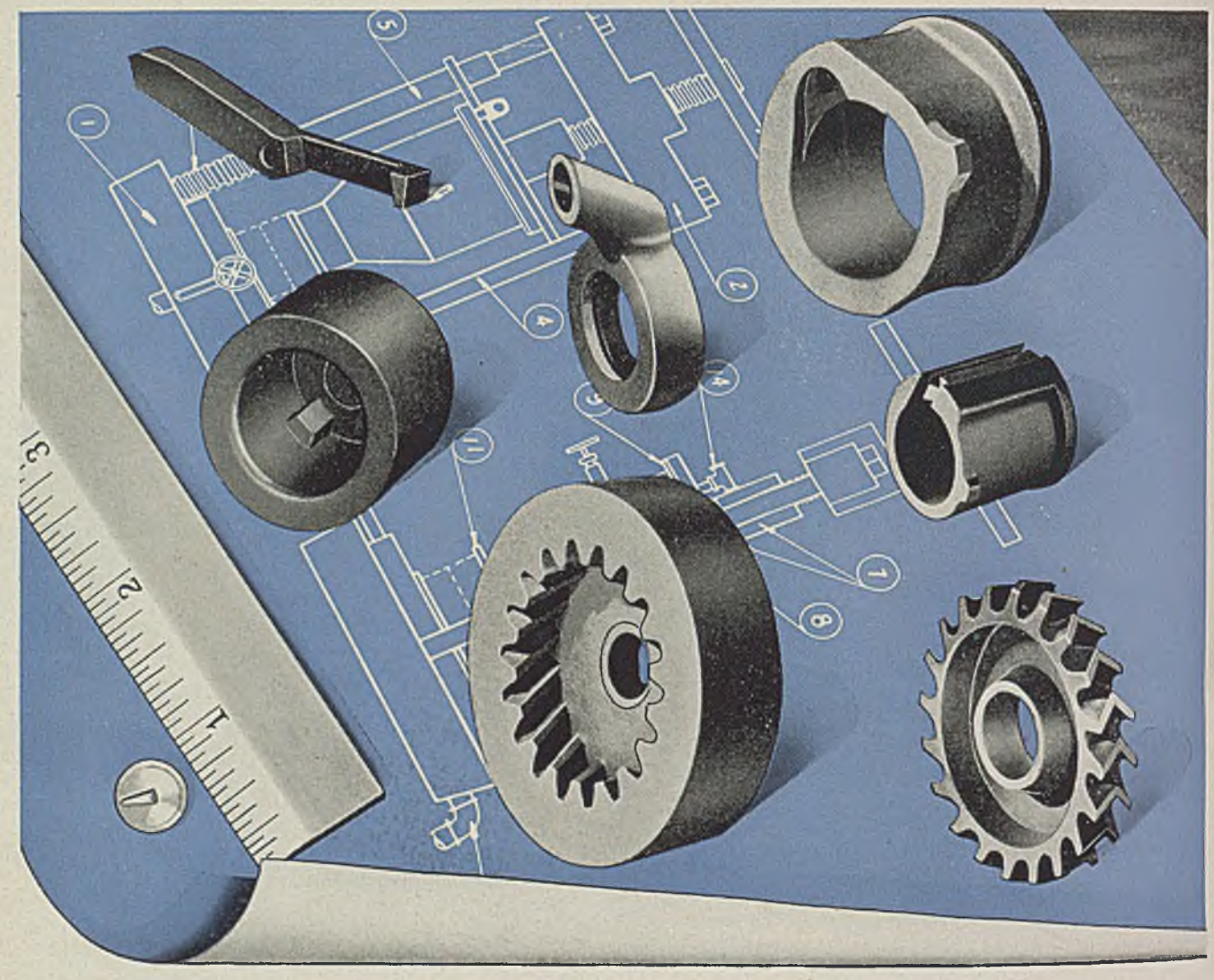

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surface contact resistance can easily lower welding current to a point where the weld nugget is too small to give the strength needed, or lacks the desired metallurgical structure.

Tip Maintenance: Presence of oxide films on the surface also has another important disadvantage in spot welding. Due to the uneven distribution of welding current on the surface of the work resulting from nonuniform surface resistance, there may be a strong tendency for the aluminum to melt and stick to the welding electrode. This "pickup," as it is called, in turn produces further trouble by indenting and marking the surface at subsequent welds, calling for excessive maintenance efforts directed toward keeping the electrode tips clean, smooth and of proper contour.

Because welding tips are hollow to provide for proper circulation of a cooling medium, only a certain amount of material can be removed in dressing the tip before it becomes necessary to replace the entire tip—additional expense and time being involved to take care of this replacement.

Obviously such conditions cannot be tolerated in any spot welding of aluminum alloys for aircraft or other vital work. And certainly they have no place in today's modern plant where every means is sought to improve quality and quantity of the output.

Removing the Oxide: Oxide coatings can be removed by either mechanical or chemical methods. Mechanical means may involve the use of a fine grade of abrasive cloth, fine steel wool, or a fine steel scratch brush power driven direct from an electric motor or through a flexible shaft or worked by hand. Great care must be taken not to cut through the pure aluminum outer layer of such alloys as the Alclad series. Too, the oxide must not be removed too far in advance of actual welding or a new layer may reform.

One of the most widely used mechanical cleaning methods is to scrub the area to be welded with steel wool. However, this can be expensive and time consuming. For instance, base 24ST alloy is quite difficult to clean in this manner in that heavy pressure is required to break through the oxide layer, resulting in high labor costs. Fairly low surface resistances are obtained only by prolonged scrubbing.

Chemical Processes: Seeking an improvement over mechanical cleaning methods, a number of chemical processes have been developed to remove the oxide coating on pure aluminum as well as aluminum alloys. However, the complete solution to this problem is not easy because of factors involved.

First, the aluminum sheet usually has a multitude of surface markings for layout and identification work. Also grease, dirt and other contamination from processing may be present. All these must be removed effectively if uniform high quality welds are to be obtained.

Second, the process should completely remove all of the oxide film. Partial removal will not meet the requirements in that excessive or nonuniform surface contact resistance may still prevent fast production of good welds.

Third, upon removal of the oxide coating, the cleaner should stop its action and not attack the base metal itself. Such attack results in the production of smut and other undesirable surface conditions, some of which can be just as bad as the oxide which has been removed. In this connection, the cleaning method should be noncritical as to processing time; that is, overtreatment should produce no undesirable effects. Times and temperatures should be broad enough to produce good results over a considerable range.

Fourth, none of the chemicals utilized in removing the oxide should have any toxic effect on the workers. Result of prolonged exposure to certain chemicals may be quite obscure yet at the same time greatly affect the health and well-being of the workers. So caution on this point cannot be emphasized too much.

Fifth, the process should be reasonable in cost, easily applied and capable of meeting the high production schedules of modern mass-production fabricating plants.

Diversey Process: Of the many attempts to meet the above set of requirements, only a few have even been successful. A treatment that a number of large aircraft manufacturers have found to be most effective is known as the Diversey process. It has a number of features that account for its enthusiastic acceptance in many plants spot welding aluminum-base sheet materials.

First step in use of this process is to remove all identification markings, grease, dirt, and other surface contamination by immersing the work in a cleaning solution made by dissolving Diversey D-C No. 36 aluminum cleaner in water. This produces a solution that is inhibited so that little if any attack can take place on the aluminum surface. Only oil, grease, identification inks, and other surface dirt is affected.

Action of this cleaning solution depends almost entirely upon wetting and emulsification. High wetting power allows the solution to contact and penetrate surface soil and float it free. Emul-

BALL SORTING GAGE

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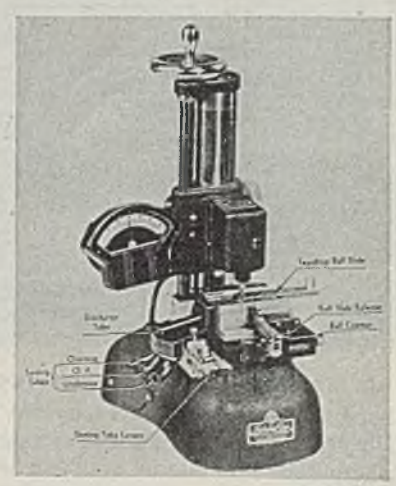
BALL sorting gage that provides a fast and accurate method of quality inspection, by mechanical operation, of small lots of precision balls has been developed by Pratt & Whitney, Division Niles-Bement-Pond Co., West Hartford, Conn. With the addition of cup type hopper and tube, readily attached to instrument shown in accompanying illustration, production can be greatly increased.

Tear drop in ball slide allows positive positioning of ball between T-C button on anvil and diamond gaging point, when ball slide is in gaging position. Deflection of ball slide release lever allows slide to be moved from gaging position to unloading position while at the some time tripping the ball counter.

Ball slide can be conveniently operated to and from loading position by right index finger, right thumb depressing ball slide release lever. Sorting tube levers are conveniently positioned for left hand and allow simultaneous operation with functions of right hand, thus providing rapid operation. Indicating meter on model BE 748 Electrolimit External Comparator can be graduated to permit ball inspection to tenths, half tenths or hundredths.



sification helps surround the soil particles and so speeds their removal.

This solution is kept heated to 180° F. The high temperature facilitates the chemical cleaning action so that total time in this cleaner need be only 2 to 5 min, a reasonable period from the standpoint of being able to process a great quantity of work in a short time.

Second step involves a hot water rinse —4 to 5 min in clean water that has been heated to a temperature of approximately 140°F. Proper agitation, of course, is usually provided to facilitate the rinsing action.

Effectiveness of the cleaning action is indicated by absence of any "break" in the water when rinsing. Such a "no water break" test is regarded as evidence of a chemically clean surface.

Third step is immersion in an acidic type solution commonly called an etch. Made by dissolving Diversey D-C No. 1 in water, this bath is operated in the temperature range of 175-180° F. Time of immersion is varied according to the particular alloy being treated.

This solution dissolves the aluminum oxide film on the surface of the sheet. When the oxide has been removed, action of the solution practically stops as any subsequent attack on the base aluminum metal is negligible.

Fourth step involves removal of the etch by a thorough cold water rinse.

Treatment Non-Critical: Since industrial use of a given process depends in large measure on how difficult it is to control, it is of interest to examine the effect of varying the treating time in the etch bath. Preparation for welding, as previously explained, involves production of a surface characterized by a low and uniform electrical resistance. Therefore the value of the surface or contact resistance can be utilized as a means of measuring the effectiveness of the entire cleaning cycle. This resistance is determined by means of a Kelvin bridge.

In order to determine the resistance considered normal or maximum that would assure good welds, a control value was determined by scrubbing sample strips with steel wool to a point where good welds were obtained consistently. Such strips showed that the average surface resistance between the electrode tip and the sheet being welded amounted to 16 microhms. A current of 70 amp and a tip pressure of 1000 lb were used in obtaining all surface resistance values mentioned here as determined by the Kelvin bridge.

Cleaning Plain 24ST: As previously mentioned, cleaning plain 24ST aluminum sheet for welding, using steel wool to remove the oxide, is difficult because of the bright hard layer that lies underneath the dark surface. Contact resistance tests have shown that the usual cleaning given in production work with steel wool results in an average surface resistance of 60 microhms. Even prolonged scrubbing with the steel wool only reduces this resistance to an average of 27 microhms. On the other hand, the extremely short time of 2 min in the etch bath when using the Diversey process results in the low contact resistance of 12 microhms.

Reports from users of the process point up some of its important features. Names of plants mentioned below can be supplied upon request.

No Smut Deposits: At Plant A, extensive laboratory and pilot plant tests were made before adopting the process. These tests on various Alclad and base alloys showed that no smut deposits developed even for treatment periods required to produce the lowest possible surface resistance. Contact resistance of 9 microhms was obtained using a Kelvin bridge, this value being very stable as no variations were found.

Actual welding tests in this plant averaged 225-284 spots without fouling of the electrode tips. Of the many different treatments that were tried out here, the new process gave the most consistently satisfactory results and was adopted for regular plant production.

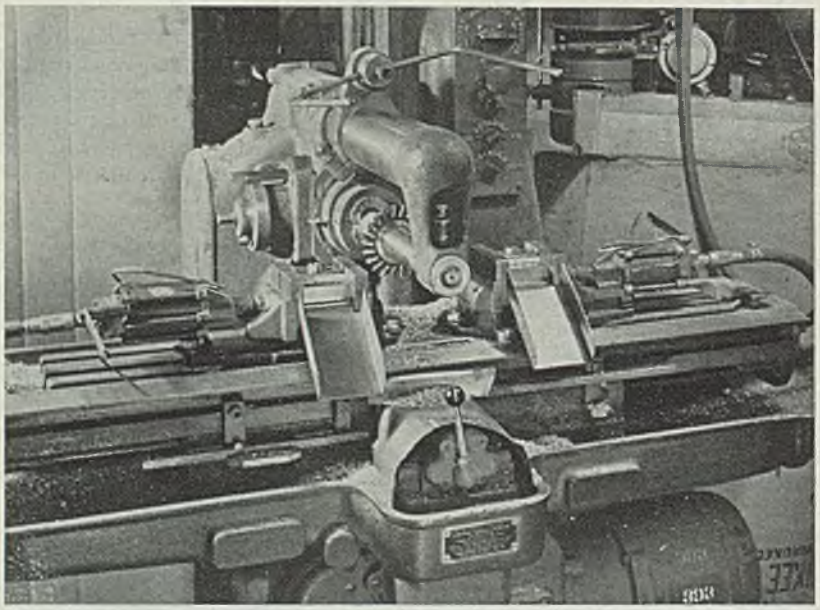
At Plant B, comparative tests were run on 13 different cleaning methods. The new process permitted welding an average of 930 spots before tips required cleaning, a figure so much higher than other methods that it was subsequently checked and again rechecked with consistently high results.

Here aluminum strips treated by the improved cleaning method averaged 680 lb in shear tests, easily meeting Navy specifications that called for 620 lb. Results of use in regular production runs continue to surpass expectations.

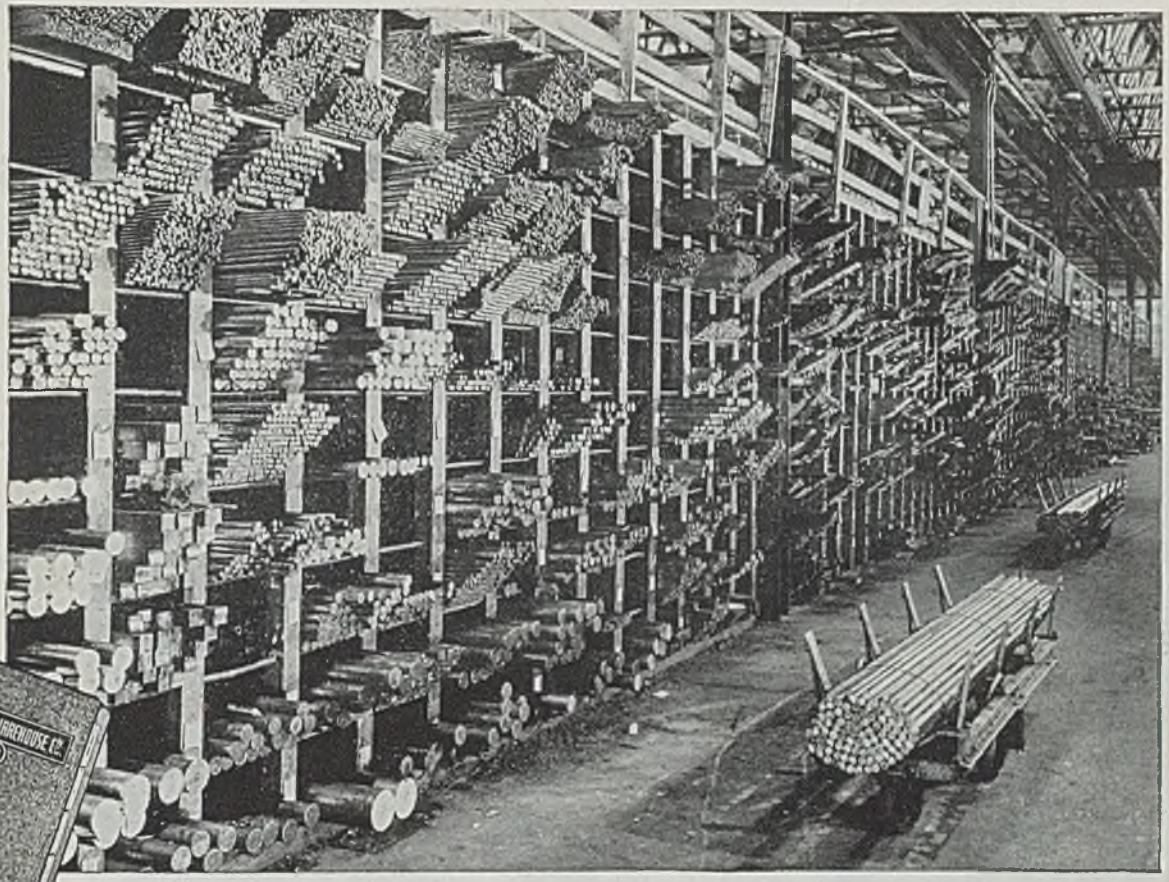
Doubles Output: At Plant C, three operators using the new process are able to handle surface preparation work that formerly required 50 persons. While using the scratch brush method, the plant averaged a production of 3,500,000 spot welds per month. This now has been increased to 7,000,000 monthly by use of the improved cleaning method. Between 400 and 600 spots are welded before electrode tips require dressing. Welds are of consistent high quality.

40:1 Performance Ratio: Plant D was having considerable difficulty in making a sufficient volume of acceptable spot welds in Alclad 24ST, base 24ST and 52S ½H aluminum. Main assembly line was being held up for lack of material from the welding department, caused by difficulties in using a highly critical cleaning cycle. Only 15-20 welds could be made before it was necessary to dress the electrode tips.

The number of spot welds that are now made before the tips require dressing averages approximately 600—a performance ratio of 40:1 or almost a 4000 per cent increase in output per dressing.



AIR AT WORK: Milling a slot 0.156 in. wide by 0.50 in. deep in half-hard brass is accomplished on this Sundstrand hydraulic double-acting milling machine with the aid of two air motors supplied by Bellows Co., Akron, O. Five pieces are held in special fixture and milled at one time. Air motors automatically open one fixture while closing other.



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Forgings and Stampings

(*Continued from Page* 111)

in diesel engines. Y alloy conecting rod stampings were used with success in some airplane engines, while duralumin forgings also found many and varied uses, each wrought alloy finding its well defined spheres of application.

Lack of suitable furnaces both for working and heat-treatment was a serious handicap. Electric furnaces designed for ferrous alloys were unsatisfactory for heating light alloys due to imperfect control at lower operating temperatures required; and much scrap resulted from their use. With no visible indication of temperature to act as a guide, pyrometric control was essential, but here again existing equipment, designed as it was for higher temperatures, left much to be desired.

It was in meeting these early difficulties that the salt bath played its most important role, and in spite of certain obvious disadvantages, this method of heating still finds important uses today.

Problems of Forging

Forging and stamping equipment, although more readily adaptable to requirements of light alloy working than was heating equipment, nevertheless, was far from ideal, as neither weight of the hammers nor the rigidity of guides were adequate. Aluminum alloys, due to their complex constitution, require a considerably greater amount of energy to impart the degree of deformation necessary for optimum properties to be obtained. A modern battery of British drop hammers for production of piston stampings, with a capacity of 1 to 3 tons, is shown in Fig. 2.

After the development of duralumin and Y-alloy, no very important developments in the way of improved alloy compositions were evolved for some time. Preoccupation with difficulties of developing manufacturing techniques probably absorbed all energies and thoughts of those concerned, and it no doubt took some time for engineering developments to exploit their properties to the full. During this brief lull these two alloys, each in its particular sphere, retained unchallenged supremacy.

By 1927, however, engineers had caught up again and need for improved materials became once more a matter of urgency. This necessity was thrown into high relief by the international race to develop high performance aircraft engines for the Schneider trophy contests of 1929-1931. Interest focused on the potentialities of strong light components of wrought aluminum alloys. Older casting alloys had made their great contribution to aeronautical progress but the limit of their strength had been reached. Higher strength and increased uniformity and reliability became urgent requirements for highly stressed components then visualized.

This resulted in the development by Messrs. Hall and Bradbury, in 1927—primarily for the Rolls Royce R engines—of the RR range of cast and wrought-alloys, and in their subsequent large-scale manufacture, commencing in 1930, as the Hiduminum RR series of alloys. Greatly improved properties of these alloys, together with rapid growth of knowledge of their properties and technology were quickly utilized by aircraft designers and constructors.

Within a remarkably brief period, the new alloys were being forged into a wide variety of highly stressed aircraft engine components such as radial-engine crankcases, cylinder heads, cylinder barrels, supercharger rotor, etc., and of course, the pistons and connecting rods already mentioned. These and many other forged light alloy components, previously deemed impossible of manufacture by forging to give the strength and other properties required by the designer, were very soon in production on a scale which in those days seemed very large indeed.

These new alloys possessed good working properties and were comparatively easy to manipulate, but rapidly increasing production naturally placed a considerable strain on the available plant and again directed attention to the need for more powerful equipment and tools.

The next decade, up to 1939, witnessed a tremendous growth in the uses of light alloy forgings and stampings and vast improvements in their properties and quality were achieved in response to demand created by the rapid increase in the power of plane engines during this period.

A line of development along which considerable progress has been made in recent years is modification of the old duralumin composition to yield a variety of alloys of greatly improved mechanical properties. Thus, in the British Empire, we have two principal types of wrought aluminum alloys—the duralumin and the Hiduminium RR types. They afford a very wide range of physical and mechanical properties. A reduction-gear carrier plate of Hiduminium RR 56 is shown in Fig. 1, while Fig. 4, shows tail wheel fork stamping of the same metal. Developments in plant and equipment also have played a very important part in the attainment of the present high standard of light alloy forgings.

In early days, drop hammers and presses available to stampers were of very limited capacity so that forging had to be carried out in a relatively large number of steps with repeated reheatings to restore the working temperature. Nowadays power and weight of presses and hammers have been greatly increased so that forging operations are carried out in a fraction of the time previously required (Fig. 2-3). Different functions of drop hammer and press have not altered materially but greater power and mechanization of production line have been the principal factors in improvements achieved.

The old drop-stamper very often worked with improvised tools which he himself had built. Today he has at his disposal the full resources of specialized machinery and the skill and art of the toolmaker, while the job is planned by experts in both its mechanical and metallurgical aspects. There is still one branch in which the skill of the forger remains of supreme importance, and that is in the preparation of the *dummy* prior to stamping. For complicated stampings this preliminary work is carried out by hand manipulation under the forging hammer, and although operator is provided with templates to work to, forming of the dummy to the contours of stamping die calls for the highest degree of skill and accuracy of working. This operation is of the utmost importance as it is the one which pricipally determines the ultimate properties of the stamping.

Multiple tooling, particularly in press work, has reached a high degree of perfection. Compared with the old piston, machined from a solid forged *cheese*, the modern pressed piston, close-forged to finished dimensions, requires a very small amount of machining. Apart from obvious economies in material and labor thus affected, this type of forging gives considerable improvements from the metallurgical point of view.

Probably no branch of the fabrication of aluminum alloys has seen more development in recent years than the technique of heat-treatment. In the past, lack of knowledge and of proper indus-

PROPERTIES OF STAMPINGS

	0-1% Proof Stress Tons/sq. in.	Ultimate Stress Tons/sq. in.	Elongation % in 2 in.	Brinell Hardness
Longitudinal	27-7 to 31-5	32-0 to 34-0	12 to 17	145 to 150
Transverse	29-7 to 30-7	32-5 to 34-0	8 to 13	

This range of figures was taken from 18 test pieces from the same stamping.

Are You Taking Full Advantage of these *newest* NORTON DIAMOND WHEELS?

YOU can get Norton Diamond Wheels not only in all the popular sizes and types for grinding carbide tools but also in a wide range of sizes and shapes for use on materials that are unworkable with ordinary grinding wheels. The three Norton bonds — Metal, Resinoid and Vitrified—make it possible for Norton Diamond Wheels to meet many different conditions.

GLASS (Optical, Container, Plate, Industrial, Watch Crystal) Diamond Wheels for cylindrical and surface grinding, cutting-off, edging, lens generating.

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NORTON COMPANY
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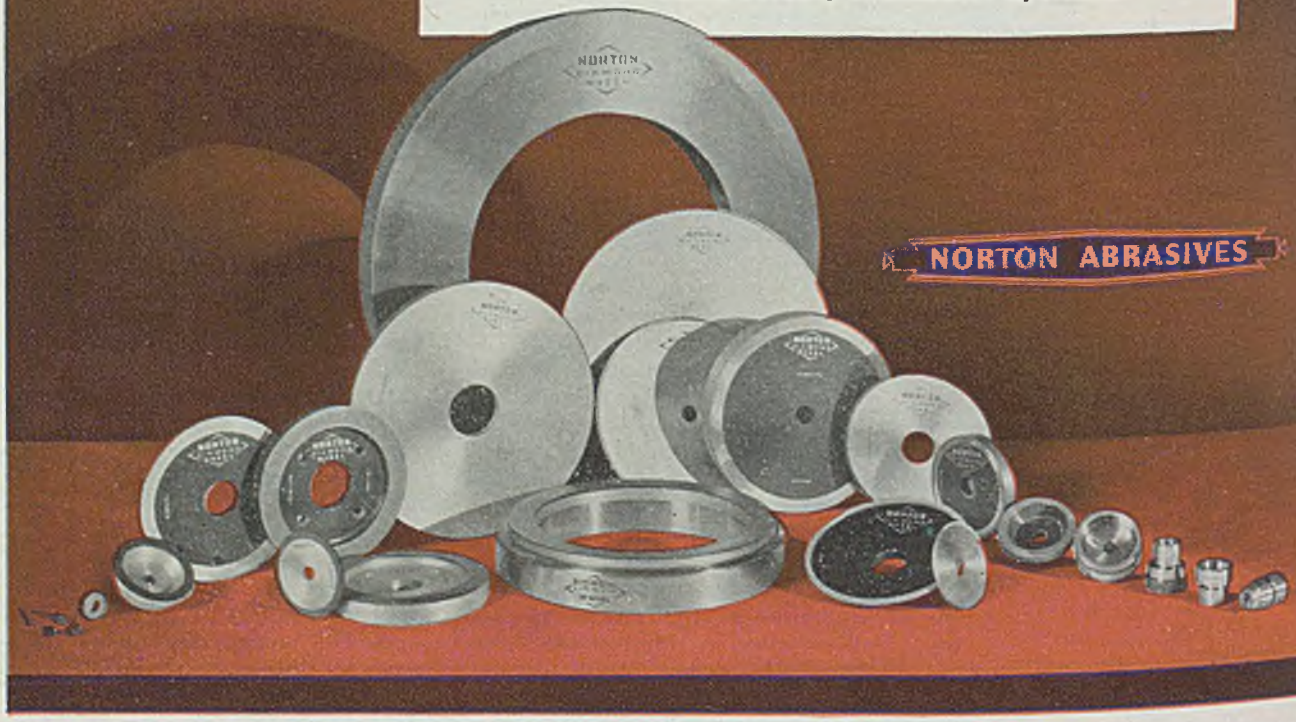


trial equipment made this operation the one most open to abuse. That heat-treatment is now a highly developed science is due to intensive metallographic research on the constitution and structure of alloys and to co-operation between engineer and metallurgist. During the war a considerable amount of experience was accumulated as a result of this collaboration, with results which are clearly reflected in the quality of light alloy components and in the machines in which they are used.

The days of the salt bath, with handling of each individual part, are gone. In its place we now find highly efficient furnaces, controllable to plus or minus 2° C, in which the whole cycle of operations is continuous and automatic. Use of such specialized equipment not only insures that each forging receives exactly uniform treatment, but it also permits highest rates of production at a minimum of cost

Strength Factors Understood

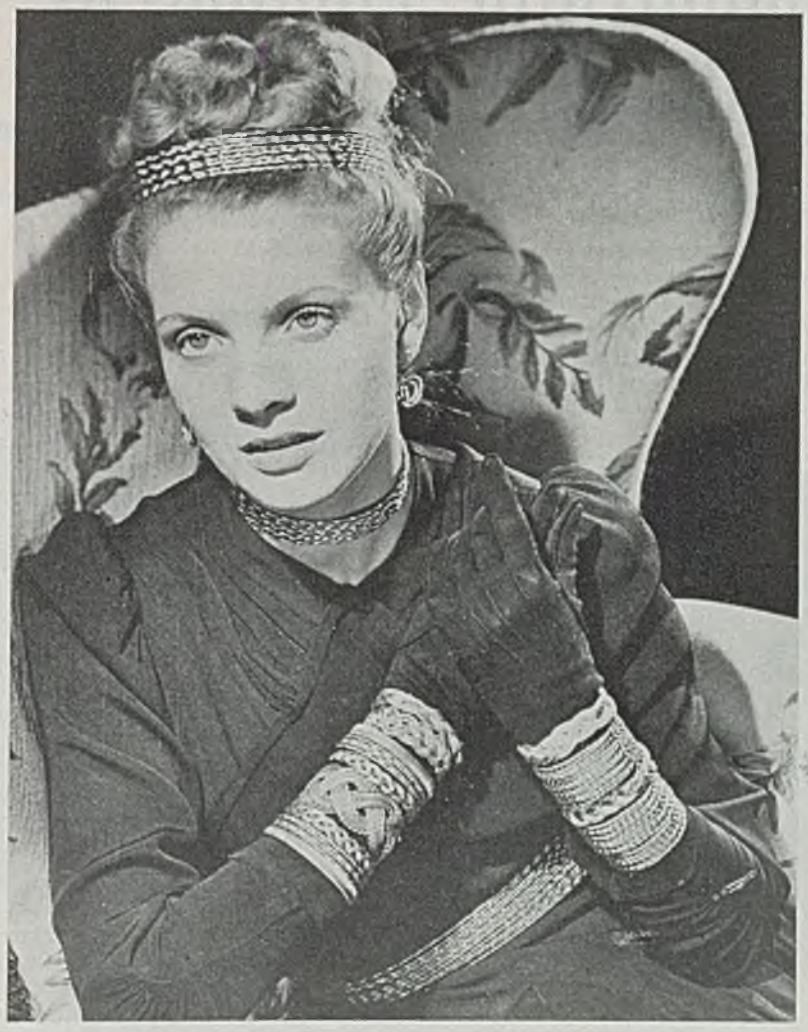
Control of quenching stresses is accomplished by development of x-ray crystallographic methods almost to the state of a routine test. Physical properties expected from light-alloy stampings are naturally higher today than ever before, and this standard is being regularly maintained (Fig. 5). Not very long ago a figure of 25 tons psi ultimate tensile strength from actual stampings was considered to be fairly good. Today this figure has been increased to 30 to 35 tons with an 0.1 per cent proof stress of 27 tons psi. A 10-ton increase in strength may not sound a great deal but it represents a 40 per cent improvement which, measured in terms of effort required to bring it about, represents a very considerable achievement.

Actual tensile strength, however important, is only one of the many essential features of a high quality light-alloy stamping. Too often, good mechanical properties have been obtained in the longitudinal direction, while those in the transverse direction have been disappointingly low. Good grain flow, homogeneous crystal grain-size and particle distribution of the constituents are all factors which must be correlated with strength. These factors alone have caused many worries in the past, but they now are thoroughly understood and controllable.

A recently introduced alloy DTD 364A, a development of the old dural composition, and the aluminum-copper-magnesium-manganese-zinc alloy DTD 363A, are known to possess very attractive tensile properties in the form of extruded sections and bars—over 30 tons in the former and over 38 tons in the latter—but until very recently, due to difficulties in working, these high figures have not been reproduced in forgings and stampings. It is now possible, however, to produce—under carefully controlled conditions—stampings in the DTD 364A alloy with the following properties in the actual stampings:—

26 tons psi, 0.1 per cent Proof Stress
30 tons psi, Ultimate Stress
8 per cent Elongation

Another important alloy development resulting from several years' research is Hiduminium RR77, previously covered by specification DTD 363A. This alloy now has been modified to enable it to be produced in the form of forgings by normal production methods and yet retain its unparalleled mechanical properties. In this work many difficulties have been encountered, to be solved step by step as the complex characteristics of this aluminum-copper-manganese-magnesium-zinc alloy have been resolved. Identification of the compounds formed in this alloy and the explanation of its structure by the metallographer represent a most praiseworthy achievement. This alloy, in all its wrought forms is believed to be the strongest wrought light alloy now available. Typical properties taken from stampings in the new alloys are shown in accompanying table on p. 141. It may be seen that this alloy, in all its wrought forms, has become one of the strongest wrought light alloys now available.



TARNISH-PROOF: Costume jewelry in the form of bracelets, necklaces, belts, ear rings and head ornaments, was exhibited recently at the National Metal Congress in Cleveland by Rustless Iron & Steel Division, American Rolling Mill Co. Metal is ductile enough to be formed, braided or twisted into desired pattern, and is electropolished by a special Rustless Process. The jewelry will not corrode or tarnish

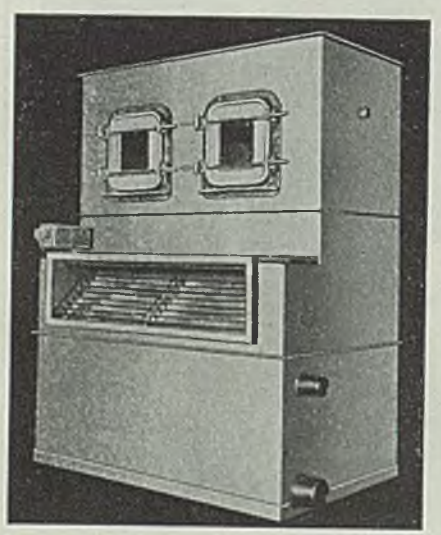
—o—

Meehanite Metal Corp., Pershing Square Bldg., New Rochelle, N. Y. has available a motion picture entitled "Meehanite Means Better Castings." Film is in black and white 16-mm sound, with running time of 29 min. It displays the engineering characteristics of Meehanite castings and their industrial applications.

INDUSTRIAL EQUIPMENT

Humidifying Unit

In addition to present units, a vertical contractor of heavy duty construction is offered in the new Kathabar unit announced by Surface Combustion Corp., Toledo 1, O. This unit has been developed especially for larger industrial applications where close control of humidity



is necessary to maintain product quality and to insure continuous production.

Kathabar systems provide a means of dehumidifying-humidifying the air independently of temperature for processing operation and for personal comfort. Units are in operation in foundries, and in the manufacturing of glass, matches, photographic film, pharmaceuticals, foods and other processing operations requiring "controlled humidity" atmospheres in quantities from 10,000 cfm to 70,000 cfm. Smaller package units from 1350 cfm to 5000 cfm and large central systems are also available

Steel 3/18/46; *Item No.* 9079

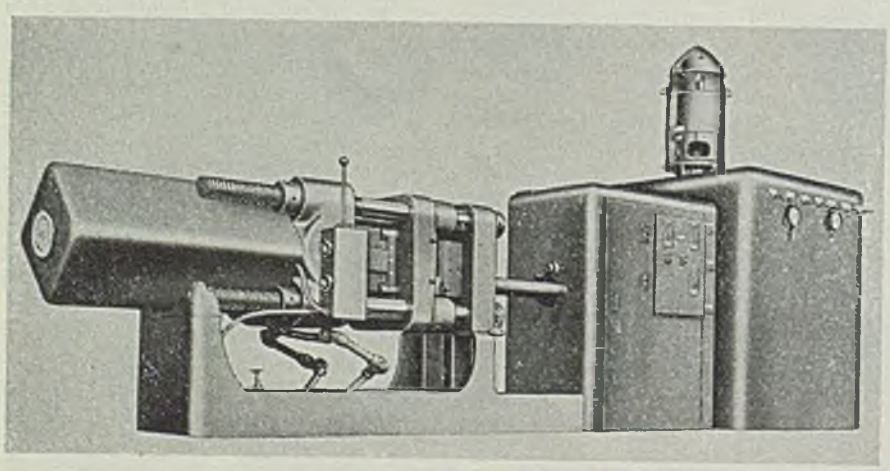
Die Casting Machine

Known as the HDW Series, a new line of die casting machines is announced by H. L. Harvill Mfg. Co., Los Angeles. This machine is a heavy duty, high capacity cold chamber type of die casting machine with provision made for the addition of a hot chamber furnace and an injection attachment so that the machine also may be used for automatic high speed casting of zinc, tin, or lead alloys. HDW series of machines are offered in three sizes, with model designations of HD-1W1, HD-2W1 and HD-3W1.

Hydraulic system of these machines provides hydraulic pressures from 200 psi to 1000 psi delivery which may be regulated by the operator of the machine dependent upon the pressure requirements of the casting to be done. Locking pressure on the dies is automatically compensated for increase and decrease of the injection pressure. Centrifugal pump is driven by a 15 hp motor with the consumption of electrical energy increased and decreased as the pump accelerates or decreases in its delivery of fluid. Load on pumping unit is not constant as is the case with most hydraulic systems, placing the pumping unit under high load only when the machine is in operation.

An application of three machines may be made to some particular production condition, wherein one machine operates at 200 cycles per hour and the other two machines operate at 100 cycles per hour each, or any combination of machines whose total requirements are 400 cycles per hour or less. When installed, hydraulic system is permanently connected and the valves remain constantly open. Plain water is used as the hydraulic fluid completely eliminating the hazard of fire attendant to the use of an oil hydraulic system in the presence of flame and molten metal. Cylinder speed may be varied to suit the requirements of individual castings over an infinite range from extremely slow to instantaneous without retarding the traction of the piston. The rate of opening and closing dies may be regulated also.

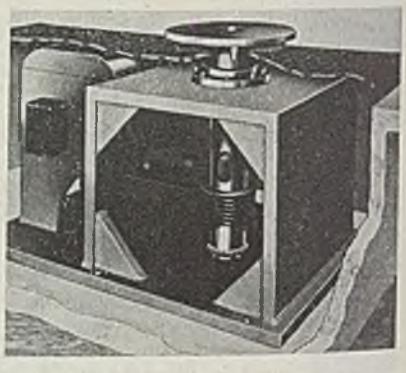
Steel 3/18/46; *Item No.* 9085



Casting Machine

Centrifugal Machine & Engineering Co., 707 Jackson court, Kalamazoo 7, Mich., announces its new model centrifugal casting machine. Illustration shows machine in pit ready for operation but without protective hoods and spill pans.

It has been engineered and built for heavier off-balance loads, for continuous



high production and for free-spinning power. Its massive construction, net weight 3700 lb, is so designed that the standard 24 in. spinning head may be extended up to 60 in. in diameter by the installation of an adapter plate. Molds may be stacked to any workable height.

The hub of the master model Centri-Meco centrifugal casting machine, which is of patented construction, is turned of 7 in. mechanical tubing of ¾-in. wall thickness. It is heat free and provides for continuous production operation with permanent molds attached directly to the heavy table mounting-plate. This heavy table has four strut-vanes which act as a fan to carry away excess heat that is radiated above the top bearing. This type of hub and table construction, holds temperature in bearing area at no greater degree of heat than 125° F.

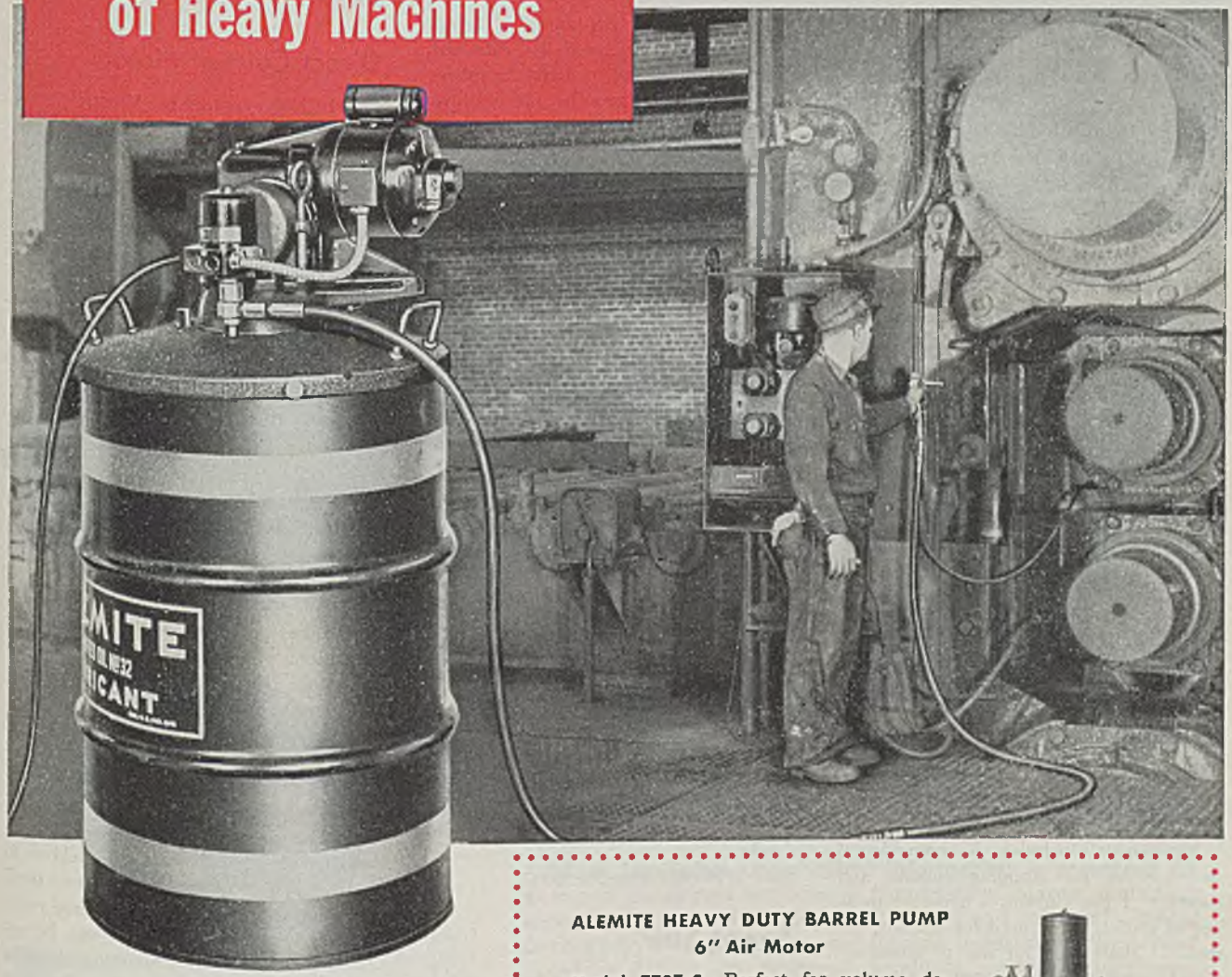
Protective hoods and spill pans which are constructed of 10 gage sheet steel according to individual needs and specifications and their telescoping feature makes possible adjustment to any height

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 148.)

It Packs the "Wallop" for Safe, Positive Lubrication of Heavy Machines

● "Weak-kneed" lubrication won't protect the heavy machines of the steel industry. It requires power lubricating equipment that packs a high pressure "wallop" that gets the right amount of lubricant onto the bearing surfaces where it belongs.

Alemite's modern power lubrication equipment saves time and money by reducing "down-time" for lubrication. Check the desirable features of the popular Alemite Barrel Pumps shown below.



ALEMITE ELECTRIC BARREL PUMP

Model 6735—Ideal for heavy duty, high pressure service in steel plants. It pumps fibrous, heavy and light-bodied lubricants through either single or multiple outlets from original 400-lb. drum. Has a ½ H.P. 110-220 Volt A.C. motor. Special voltage units also available. Builds up to 3,000 pounds grease pressure. Low pressure model handles fluid lubricants for gear case lubrication. Get complete details from your nearest Alemite Distributor. Or, write Alemite, 1879 Diversey Parkway, Chicago 14, Ill.

ALEMITE

Alemite ALONE *Combines all 3 in Lubrication*

1. EQUIPMENT 2. PROCEDURES 3. LUBRICANTS

ALEMITE HEAVY DUTY BARREL PUMP
6" Air Motor

Model 7707-C—Perfect for volume delivery of lubricants in steel plants with limited air pressures. This giant size air pump handles fibrous, viscous, heavy, and light-bodied lubricants through one or several outlets from original 400-lb. drum. Models available that develop pressure of either 11, 15, 40 or 80 times the air pressure applied.

ALEMITE HEAVY DUTY BARREL PUMP
4½" Air Motor

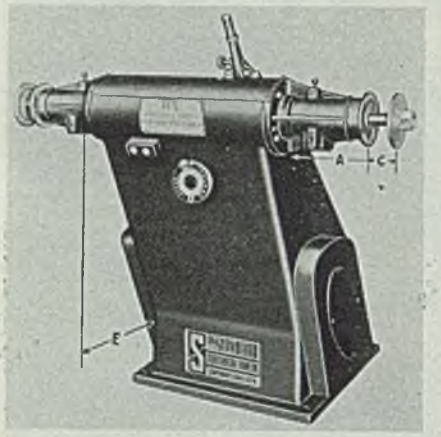
Model 7701—Air-operated, for high and low pressure service, it pumps fibrous, heavy, and light-bodied, and semi-fluid lubricants even at low temperatures. Delivers from original 400-lb. drum. Serves single or multiple outlets. Models available that develop pressure of either 5½, 7½, 20 or 40 times the air pressure applied.

from 8 in. upward as required.

Unit has motor mounting which is adjustable to standard belt lengths to permit greater variance of speeds by mechanical changes of drive pulley. Motor of standard model is in ratio of 1 to 1 but by changing drive sheave almost any desired speed may be obtained from 400 rpm to motor speed.
Steel 3/18/46; *Item No.* 9077

Buffing, Polishing Unit

Standard Electrical Tool Co., 2504 River road, Cincinnati 4, announces type RV infinitely variable speed buffing and polishing machine. It is available in 5 hp and 7½ hp sizes. Any spindle speed between 1500 and 3000 rpm is instantly obtained through the Speedial control. This permits handling of a variety of materials and work, with the correct speed



for buffing or polishing and, as wheels reduce in diameter, spindle speed can be increased for maintaining desired peripheral speed on the wheels.

Equipment includes a coincidental switch-brake for stopping spindle and shutting of the current, a separate push button station being used for starting the motor. Shaft lock for use in changing wheels conveniently located.

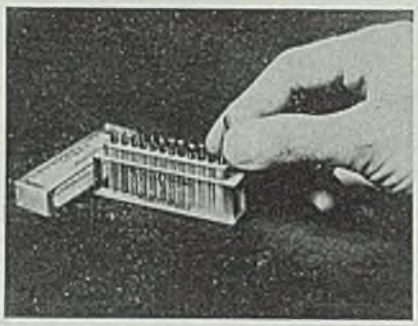
Spindle overhangs the front of the base. The "E" dimension in accompanying illustration is 13 in. Four ball bearings in liberal size oil reservoirs with sight feed oil gauge on each bearing housing.
Steel 3/18/46; *Item No.* 9045

Voltage Regulators

Three miniature cold cathode voltage regulators for 65 to 90 v operation where currents range between 2 and 3 milliamperes and maximum voltage variation may not exceed 3 v, are announced by Sylvania Electric Products Inc., Industrial Electronics Division, Boston. Mounted in miniature polarized bayonet bases, bulbs of these tubes are enclosed in a metal shield which is color coded for quick, visual identification. They are 1⅝ in. overall and ⅝-in. in diameter. Used in series with a current-limiting resistor of approximately 15,000 ohms on the load side of a 175 v dc source, they may be operated in any position.
Steel 3/18/46; *Item No.* 9078

Rotary Files

Rotary files of solid tungsten carbide are being manufactured in extremely small sizes by Lincoln Park Industries, Lincoln Park 25, Mich. These tools known as Midget Carburs are furnished in sets



for tool room, die shop, pattern shop and general production use. Set consists of 12 tools in assorted shapes contained in a plastic case. In application they serve as a replacement for hand files and mounted grinding wheels in innumerable operations requiring these tools. Their extreme hardness permits them to be used on practically any material, including hardened steel up to 65 rockwell C. Sharp corners, forms and radii can always be maintained. Twelve tools produced for the standard set, and which may be purchased individually if desired, are 1⅛ in. overall with ⅛-in. diameter shanks.
Steel 3/18/46; *Item No.* 9037

Power Saw

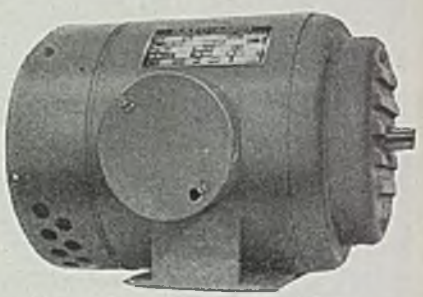
New improvements have been made in the exterior appearance and mechanical operation of the Saw-Gun, a portable power saw and file which is propelled

by electricity, air or flexible shaft. Ordinary hack-saw blade or file fits into holder.

Improvements include a modern streamlined housing which is highly polished and of perfect balance; a tubular, ribbed hand-grip is built into the housing which, by special construction, remains cool even after hours of continuous operation. However, a pistol-grip, detechable handle is provided as standard equipment, and may be used by the operator if considered more convenient. Interior mechanism has been completely revamped to insure smooth, uninterrupted operation. Device is manufactured by Mid-States Equipment Corp., 2533 East 73rd street, Chicago 49.
Steel 3/18/46; *Item No.* 9031

Direct Current Motors

Kato Engineering Co., Mankato, Minn. has added several sizes of direct current motors to their line. Illustrated is the Model 1/2 DV07 which is rated at 1/2 hp and has an ampere input of 18. This model is approximately 10 15/16 in. long by 7 3/32 in. high by 7 in. wide and weighs approximately 45 lb. This design is available in sizes 1/3 and 1/4



hp. Other sizes are available upon specification. Motors are of all steel construction. Endbells are made of steel and frame is molded and welded. The drip proof louvered cover is also of drawn steel and motor may be ordered with or without this louvered cover. Motor has ball bearings with grease seals. Lubrication can be replenished by removing metal disks which are held on to both ends of motor with three small machine screws. Both the louvered cover and commutator end cover can be rotated so as to permit mounting motor in any horizontal position and the motor is drip proof when horizontally mounted. Motor can be vertically mounted if desired. Brush holders are of stamped brass with adjustable tension arms. These motors are also available for 110 and 220 dc.
Steel 3/18/46; *Item No.* 9056

Spindle Machine

Universal Boring Machine Co., Hudson, Mass. offers new 4 in. spindle horizontal table-type milling, drilling and boring machines with a speed range of 8 to 1000 rpm and 5 in. spindle machines 7 to 850 rpm.

These machines are offered with a

(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 148.)

FACTS AND FIGURES ON NEW AND EXPANDED FACILITIES OF THE STEEL INDUSTRY ARE NOW REVEALED IN . . .

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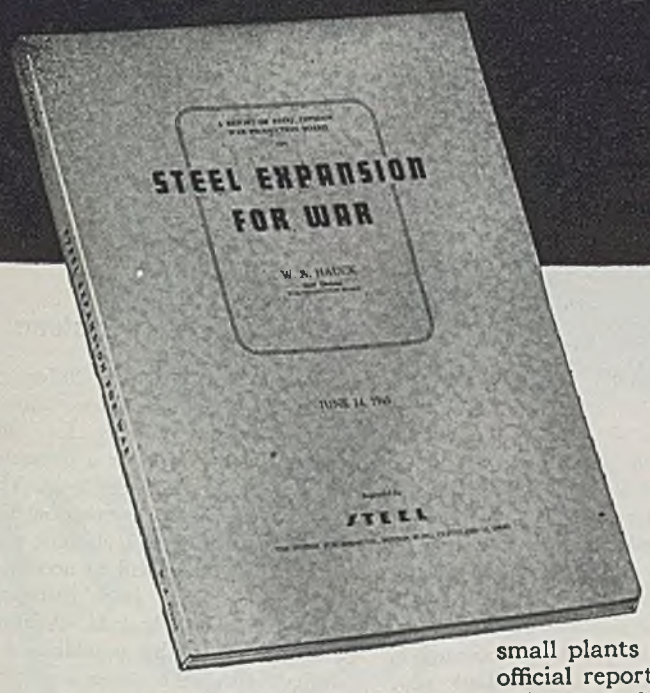

By W. A. HAUCK

[An official report by Mr. Hauck for the War Production Board]

192 pages of pertinent data on both industry and government financed projects. Detailed schedules on capacities, location and cost. Including 148 photographs.

• Mr. Hauck has been with the Steel Division since its inception in June, 1940, then under the National Defense Advisory Commission (predecessor to WPB). Assigned to the task of expanding and balancing steel capacity for war, Mr. Hauck has inspected both large and small plants all over the United States. He prepared several official reports which lead to the addition of 10,000,000 tons of integrated steel capacity, plus over 5,000,000 tons of capacity by the expansion of existing facilities.

"STEEL EXPANSION FOR WAR" is an official report on this gigantic undertaking prepared for the War Production Board and other government agencies. A large part of the data will be presented before the Senate when it takes up the problem of disposing of billions of dollars worth of surplus government-owned war plants.

Much heretofore unpublished information is presented on new and revamped facilities of hundreds of plants, including those in the ore, ore transportation, coal and coke, refractory, ferro alloy, scrap, foundry and forging industries. The report provides details on types of products, capacity increases, plant locations, costs, etc. Included are 148 photographs, plus charts and tables.

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selection of ranges as follows: 36, 48 or 60 in. vertical range; 72, 96 or 120 in. face plate to outer support; 40 x 60, 42 x 72 or 48 x 84 in. tables.

Electrical equipment comprises a 20 hp motor, which is controlled through a swinging type pendant pushbutton, giving forward, forward jog, reverse, reverse jog, and stop.

Antifriction bearings are provided throughout the speed gears, and all gearing shafts have been redesigned for heavier loads.

Steel 3/18/46; *Item No.* 9071

Hand Pyrometer

Xactemp pyrometer, designed as an accurate method for taking temperature readings of molten nonferrous metals, on a direct-reading type dial, is announced by Claud S. Gordon Co., Indianapolis. This pyrometer is of cast aluminum and brass construction. It has a 43 in. stainless steel extension and a standard 7 in. Marshall tip which permits true readings to be taken below the surface of the metal. Indicator is of medium resistance, not affected by thermocouple length, and yet travels across the scale rapidly enough to follow the most sensitive thermocouple. It is provided with an Alnico V magnet and has a 3½ in. scale reading from 50 to 2500° F.

Steel 3/18/46; *Item No.* 9083

Counterbore Set

To save production time, save space, and cut tool inventory costs, Robert H. Clark Co, Beverly Hills, Calif. announces a set of four adjustable counterbore spot facers with exceptional cutting range. Set is identified by the number CS-1H. These four tools cut any fractional or decimal diameter within ¼ to 1⅜ in. OD. Each one is quickly and easily adjustable to a wide range of sizes: Model No. 43B-H with its cutting range from 1 to 1⅜ in. OD; No. 42-H with a cutting range from ¾ to 1 in.; No. 41B-H has a cutting range from 9/16 to ¾-in.; and No. 40-H cuts from ¼ to 9/16 in. OD.

Holes may be counterbored to any depth. Unique cross-lip or shoulder prevents burrs from forming around edge

of the pilot hole and eliminates galling and binding. Pilots are hardened and ground. High-speed steel blades can be quickly and easily sharpened or replaced and are always obtainable from mill supply distributors. Each set contains, in addition to four counterbores, an assortment of 11 extra pilots, all mounted in convenient wood crib box. Cast alloy blades are available for all counterbore sizes.

Steel 3/18/46; *Item No.* 9020

Surface Comparator

The quick scanning surface comparator, developed by Comtor Co., Waltham, Mass., provides a new means of inspecting the smoothness of finished surfaces. It consists of a photo-electric scanning head, a self-contained amplifier with calibrating controls, a finish meter with tolerance markers and a ball bearing work holding carriage.

The amplifier is contained in the base of the comparator and its zero setting, calibrating, and sensitivity controls are mounted on the front panels of the base.

Work holding carriage has a 7 in. travel and a 6 in. cylindrical capacity. Flat parts are placed on its table and cylinders are held between centers or placed on vees with Norbide inserts.

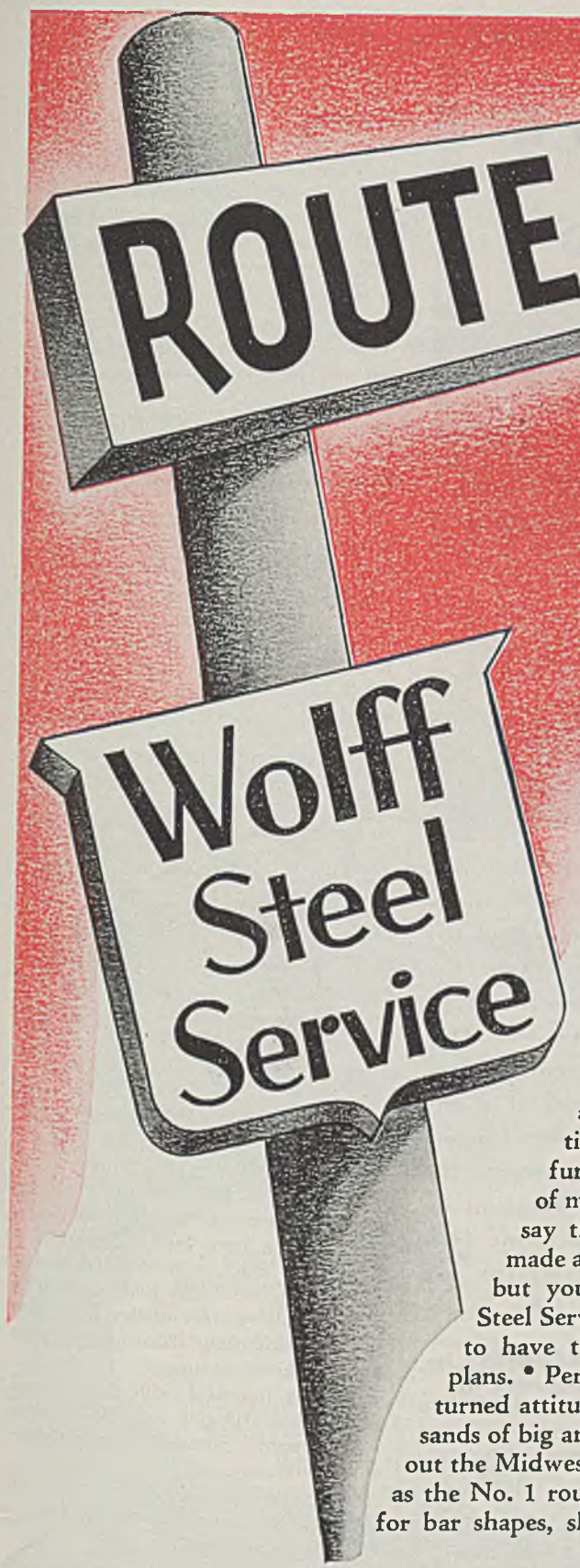
A standard of known surface finish value is placed on the work holding table, finish meter is set and its tolerance markers adjusted, and it is ready for shop use.

Steel 3/18/46; *Item No.* 9004

Parts Cleaning Systems

Gray-Mills Co., 1948 Ridge avenue, Evanston, Ill., announces three new parts cleaning systems for industrial plants. Model H-71 is a general utility unit, successor to Model P-70. The new unit incorporates a centrifugal pump which is used for hose-cleaning parts and for agitating the fluid to accelerate the cleaning of either large parts or small parts cleaned in baskets. A means for air agitation is also provided. A safety device causes the cover to close automatically in case of fire. Overall size of this model is 38 in. long, 34½ in. high, and 21 in. wide.

Model J-75 is 60 in. long, 34½ in. wide, and 33½ in. high. It is equipped with a high volume, high pressure rotary pumping unit for hose-cleaning motor blocks and other large parts. The pumping unit is portable and may be used as a general purpose transfer pump for solvents, oils, etc. This model is also equipped for



On The Road Back to Steel

Like all industry, like the mills themselves, steel warehouses too, are starting from scratch on-the-road-back-to-steel. It will be weeks, even months, before the hungry market for metal will be balanced to the point where anything like normal stocks can be carried by any warehouse, anywhere. • But even in a contingency like this, Wolff Steel Service is set to function for anyone caught on dead-center by a lack of material badly needed for production. This is not to say that miracles can be produced and required stock made available on call—for this is a general impossibility—but you can be sure that Wolff Steel Service will cover every source to have the steel so vital for your plans. • Perhaps this leave-no-stone-unturned attitude is one reason why thousands of big and little companies throughout the Midwest have come to regard Wolff as the No. 1 route to steel . . . particularly for bar shapes, sheets, plates and tin plate.

BENJAMIN WOLFF & COMPANY PRIME STEEL SERVICE CHICAGO

BENJAMIN WOLFF AND COMPANY

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

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

agitating the fluid by means of air or pump.

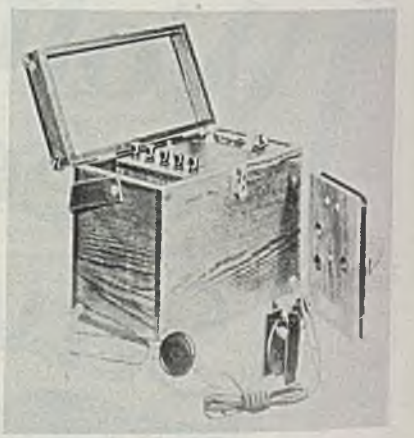
Smallest of the three, Model L-73, is 21 in. wide, 21 in. long, and 34½ in. high. Being on castors, it is easily portable. It is frequently used with a special fast acting type of solvent, such as Speed-Agitene, which the company supplies for cleaning carburetors, fuel pumps, etc.

These units are used for cleaning automotive and aviation parts, farm implement parts, machine parts, and for cleaning dies and tools, as well as appliance parts.

Steel 3/18/46; *Item No.* 9075

Cable and Pipe Locator

Combination of factors for the precise location and depth of buried pipe and cable, with the cable tester is an improvement announced by W. C. Dillon & Co. Inc., 5410 West Harrison street, Chicago 44. To the location of shorts, crosses, grounds, and wet spots the instrument adds finding ability of most practicable service. In operation it tells



just where cable or pipe is buried, and how deep. It finds old cable or pipe laid many years ago on which installation records have been lost or forgotten. It locates the exact path of cable or pipe to or from buildings; finds position of a water main in street or alley; has a lamp circuit for checking all connections after test has been set up.

Unit is furnished with detector coil and neutral exploring coil. Built-in level in coil enables operator to maintain absolute accuracy.

Size of the unit is 12½ x 7¼ x 11 in. high; weight is approximately 22 lb.

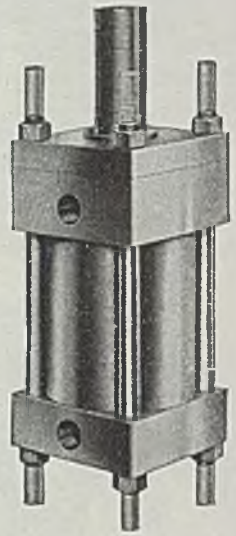
Steel 3/18/46; *Item No.* 9080

Air-Hydraulic Cylinders

Air and hydraulic cylinders with unique mounting features and steel construction are available from Miller Motor Co., 4027-33 North Kedzie avenue, Chicago. Cylinders holding 200 lb pressure have steel heads and caps and brass cylinder

walls. Hydraulic cylinders holding 1500 lb have solid steel heads, caps and walls.

A universal cylinder that may be mounted either directly on the extended tie rods or with any of the standard styles of brackets attached to the tie rods is available. Thus any cylinder can be adapted to different uses by changing steel brackets. Five new mounting styles also called the tie rod mountings are offered. Tie rods are extended on either end or both ends of the cylinder, permit-



ting a direct or flush mounting on to machine. This eliminates brackets. Nonbreakable fabricated steel head and cap is square, thus requiring less mounting space by eliminating overhang of circular construction. Piston rod bushing is locked built to close tolerances, and interchangeable. Adequate ports insure rapid, economical operation. Both cushioned and noncushioned models have identical basic dimensions and mounting dimensions. *Steel* 3/18/46; *Item No.* 9904

Grinder Coolant Filter

A new filter for cleaning grinder coolant and similar solid-bearing fluids is introduced by Cuno Engineering Corp., Meriden, Conn. Designated as Coolant-Klean, it has a replaceable (bag-type) filter element mounted on a screen spacer so as to provide a large filtering area (1000 sq in.) for full flow. No filter aid is needed; precoating time is eliminated.

Replacement of the bag is accomplished in less than 5 min. Loosening a screw clamp opens the filter; dirty element is discarded and accumulated grit emptied from the sump. A clean bag then is installed.

The filter can be applied to any type of grinder and is also adaptable to almost

There is AN EASY WAY TO LICK GEAR FAILURES

A few of the CONE-DRIVE operated "Traxcavators" at work.

If you have a job that's tough on right angle reduction gearing, there is a quick solution to your problem. Trackson Company had a problem like that. Their Model T-7 "Traxcavator" has to lift a 2½ cu. yard load some 10 feet to dumping position, through gearing operating through a 22:1 ratio on an eight inch center distance. When pilot model tests indicated a stronger gearing was needed, they substituted CONE-DRIVES.

Their Gear Troubles Disappeared

The reason is simple: CONE-DRIVE gearing has vastly greater contact area per tooth and also gives you more teeth in contact. The result is vastly lower unit-loading in lbs. per square inch and the ability to handle several times the load of other gearing of the same center distance and ratio.

In addition, if you wish, you can actually reduce gear size and still handle greater loads than with larger conventional gears. For an equal load capacity, CONE-DRIVES are only ⅔ the size, weigh only ⅓ as much.

We will be glad to send you literature on CONE-DRIVES pertinent to your products. Ask for it on your Company letterhead, today.

CONE-DRIVE DIVISION **MICHIGAN TOOL COMPANY**
7171 E. McNichols Road, Detroit 12, U.S.A.

any machine using a coolant or cutting oil. No alteration of the grinder is necessary. Installation of the complete unit between grinder pump and work nozzle averages about 15 min. Two flexible hose connections are necessary. *Steel* 3/18/46; *Item No.* 9012

Cushioning Meter

A cushioning meter, offering a simple, rapid and dependable means of determining correct type, amount, and distribution of cushioning material to protect any article in shipment, is introduced by General Electric's Meter and Instrument Division, West Lynn, Mass. This meter applies scientific test methods to the evaluation of packing systems, and measures, in standard terms, shock experienced by the object packed, thus checking the effectiveness of the packing system.

Unit consists of a detector head and an indicator. Detector head contains an

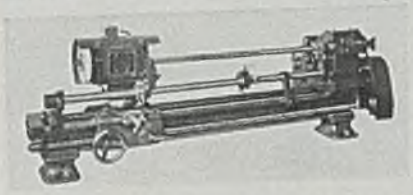
electric mechanism which responds in varying degrees to the shock it experiences. This response is transmitted through a flexible cable to the indicator, on which it is registered by the energizing of neon glow lamps marked to correspond to the peak shock expressed in G's. It registers shock in twelve steps covering a range of 10 to 100 G's. Indication is accurate to 1G on any step. Indicator circuits operate from the self-contained 110-v, 50/60 cycle, ac power supply. *Steel* 3/18/46; *Item No.* 9030

Tap Grinder

A tap grinder for sharpening staybolt taps, long taper reamers and other tools requiring relief grinding over long taper surfaces is announced by Edward Blake Co., 634 Commonwealth avenue, Newton Centre 59, Mass. Machine is designated as Model No. 4 and is specially designed so that the side of a small wheel is fed along the taper of long taps, obviating the need of a wide wheel to cover the complete taper in one pass.

Standard wheel head and work head from the standard Blake models No. 1 and No. 2 tap grinders are used on this machine. Work head is mounted on a lathe bed and wheel head is mounted

on lathe carriage cross slide. Controls on cross slide give longitudinal and cross feed motions to wheel head. Staybolt taps and long taper reamers are held on ball centers. Tailstock center can be moved off center any desired amount so that flutes remain parallel to grinding wheel. Any desired relief can be obtained by a simple setting, and any right



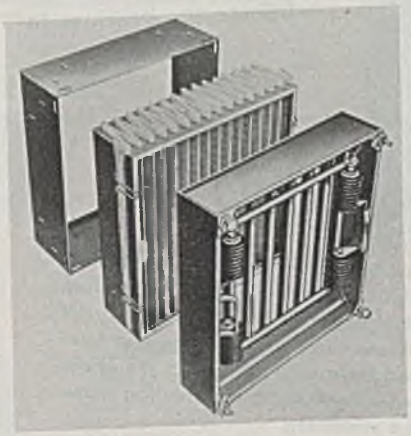
or left-hand tap, up to 43 in. long, with 2, 3, 4, 5, 6, 8 or 10 flutes can be sharpened.

Rotation of work is automatic through a separate motor mounted behind work head which revolves work through a chain of gears. Gears may be disengaged easily for hand operation. Power longitudinal feed for wheel head is obtained by engaging lead screw on carriage. A locating device locates tap flutes in proper grinding position. A wheel trueing device also is provided. This may be positioned anywhere along pivot bar, and, after being locked, wheel is fed past diamond for trueing.

Steel 3/18/46; *Item No.* 9895

Electronic Air Filter

American Air Filter Co., 125 Central avenue, Louisville, Ky., announces a new electronic air filter, the Electro-Airmat, in which the collector element is electrostatically charged Airmat paper. Introducing an entirely new principle



in electronic air filtration, the arrestance rating of the unit, when tested by the discoloration method, is 90 per cent or better with atmospheric dust or smoke. This efficiency is obtained at the normal velocity of 35 fpm thru the Airmat media and the standard rating of 1000 cfm per standard-sized 24 x 24 in. unit.

Airmat is a cellulose product composed

of a number of plies of porus, tissue-like sheets formed of short cellulose fibers in "jack-straw" arrangement.

Full height ionizers reduce electrical losses due to fewer wire ends. The power pack operates on a 110 v 60 cycle single phase current. Total power consumption is approximately 220 w at 110 v including transformer losses in the power pack, etc. When the Airmat paper has accumulated its dust load it is removed and replaced with clean material by means of turning a crank in a mechanical loader which automatically folds the paper into the serrated base section of the filter unit. Spare cells loaded with clean Airmat can be provided for convenience in servicing.

Steel 3/18/46; *Item No.* 9043

Portable Greasing Unit

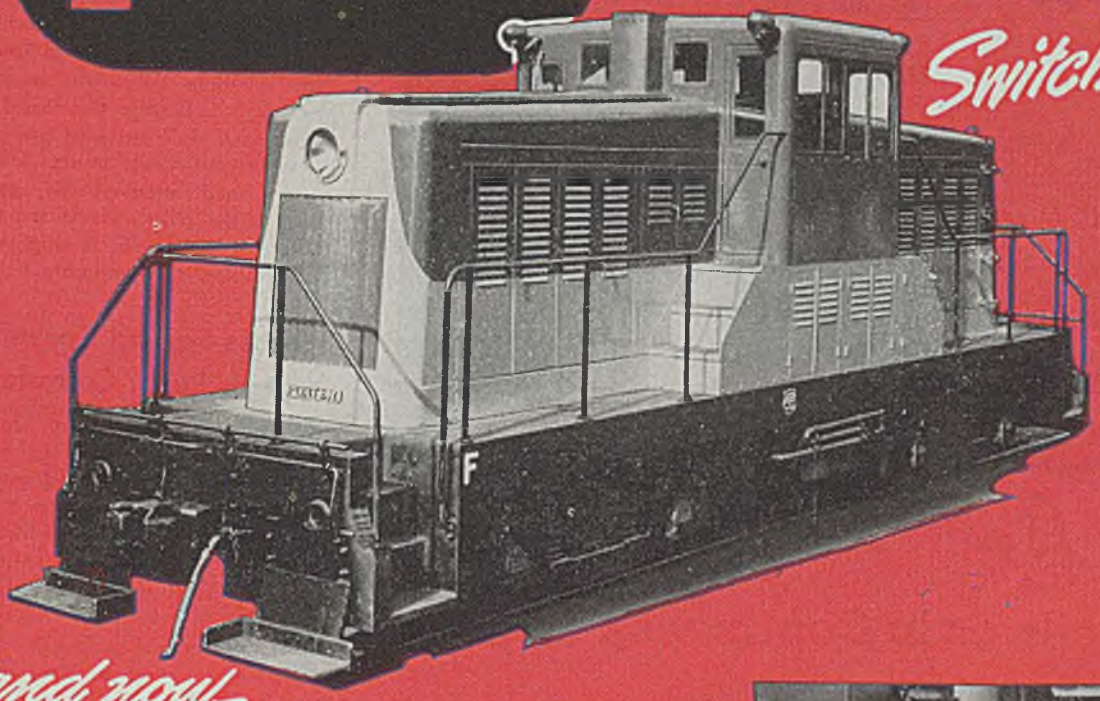
New development in the lubrication field totally eliminates the necessity for hand greasing operations and meets effectively any lubricating requirement, simplifying the grease job and reducing maintenance costs.

Equipment can be supplied with a grease gun for all purposes and is avail-

able either with battery powered or gasoline driven motor. No electric cord or air hose is required. Unit delivers up to 12,000 lb steady, consistent pressure which is instantly available to clear most obstinate channel stoppages and effect complete lubrication of parts. Complete portability provides "on the spot" lubrication —trucks, trailers, tractors, steam shovels, airplanes, rolling stock of all description may be serviced on the job without removing load. High efficiency, even in zero temperatures, speeds production, reduces operating stoppages. Compact design saves valuable floor space and increases portability. A further advantage is the ability to easily reach the difficult spots that might otherwise be overlooked or neglected. Simplicity of design —with a minimum of moving parts— reduces maintenance and assures long, trouble free, effective operation. Units are a product of Pressurelube Inc., 609 West 134th street, New York 31.

Steel 3/18/46; *Item No.* 9027

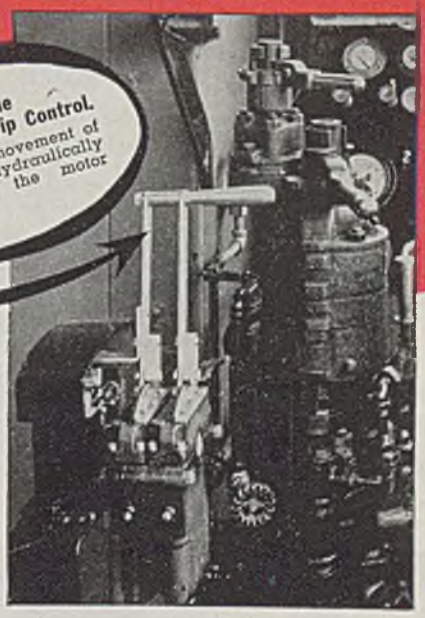
PORTER—DIESEL-ELECTRIC *Switchers*



and now—

FINGER-TIP CONTROL

- POSITIVE
- ACCURATE
- INSTANTANEOUS



This is the PORTER Finger-Tip Control. The slightest movement of the throttle is hydraulically transmitted to the motor speed control.

To the progressive refinements constantly being incorporated in PORTER Diesel-Electric Switchers we now add FINGER-TIP CONTROL.

Utilizing the hydraulic principle of transmitting motion, PORTER'S Finger-Tip Control assures accurate synchronization of motors, and positive, instantaneous response to the slightest movement of the throttle lever in the cab. Finger-Tip Control eliminates troublesome rods, cables, pulleys, and turnbuckles, with their tendency to lost motion, back lash, and need for constant adjustment. Complete description and photographs on request.

LOCOMOTIVE DIVISION:
Diesel, Diesel-Electric, Steam, and Fireless Steam Locomotives

MT. VERNON CAR DIVISION:
Freight Cars of Every Type

SPRING DIVISION:
Coil and Elliptic Springs

Write today for your copy of "PORTER Diesel-Electric Locomotives," containing full description of modern diesel-electric locomotive design.

PORTER "Better Built" Equipment
Established 1866

H. K. PORTER COMPANY, Inc.
PITTSBURGH, PENNSYLVANIA
DISTRICT OFFICES IN PRINCIPAL CITIES

Boiler Tubing

(*Concluded from page* 108)

Joint then is welded and the flames turned off. The beginning of such a plastic upset is shown in Fig. 2. Work being welded here is carbon steel tubing with a 2-in. outside diameter. An initial pressure of 900 psi, which is gradually increased to 2200 psi, is used in upsetting this material. Tubes are stress-relieved by simply reheating the cooled welded areas to a dull red heat and allowing them to cool slowly in air. After being welded and stress-relieved, pipes are bent to the proper shape and then are ready for installation. A supply of tailor-made tubing is shown in Fig. 3.

Grease-Packed Conveyor Wheels Resist Corrosion

Conveyor wheels that are grease packed on assembly are less vulnerable to corrosion and give longer and more efficient service, according to a test recently performed for Rapids-Standard Co. Inc., Grand Rapids, Mich. Two wheels of each type—standard with no lubricant, and company's recessed hub-type special grease packed No. 11—were placed in a testing machine. They were tested under a 64 lb load for 61 hr.

Wheels were run continuously for 8 hr periods with intermittent waiting periods of 16 hr. Before the machine was started and before and after each operation, the wheels were brushed with salt solution. After 61 hr of operation one wheel of each type was cut open for examination.

Result was that interior parts of standard wheel were badly corroded, including ball bearings and raceways. Wheel hub was rusted and pitted to such an extent as to fail completely in its function as inner raceway. Exterior parts of wheel had heavy deposits of rust, especially around hub opening and projecting part of hub.

Grease packed wheel still functioned perfectly after the test. Interior parts, including ball bearings, were unaffected by salt solution. Exterior parts, especially around hub openings and projecting part of the hub, were protected by small amount of grease which seeped through openings in hub during test.

—o—

Second edition of "Plans and Projects" has been published by F. H. McGraw & Co., 51 East Forty-second Street, New York 17. Issue is devoted to personnel and operations of the company's Pittsburgh district office with feature articles about the company's work in Paraguay, and the building of the Reynolds Alloy Co. aluminum plant at Sheffield, Ala.

Template Grinder

(*Concluded from Page* 109)

positioned for required stroke within a range of zero to 1¼ in. Speed of reciprocation may be set at either 50 or 100 strokes per minute.

Wheel is brought in to work by a manual cross-slide-feed hand wheel. Two ratios of cross feed (fast and slow) are provided. Operator views work through a 20 power microscope in setting wheel to work, and in performing the grinding operations. Microscope cross hairs are guided along the lines of scribed work by means of cross slide handwheel, as the wheelhead travels transversely. Four different reticles having diameters respectively of 0.005, 0.0075, 0.010 and 0.015-in. are provided with the microscope and may be used for grinding work to varying degrees of precision.

Silicone Greases Suited For Bearing Lubrication

To supply the need for abnormally high and low temperature lubrication of bearings, Dow Corning Corp., Midland, Mich., has developed four silicone greases. These greases are claimed to have a high order of heat stability, low volatility, relatively slight changes in consistency over a wide temperature range, and low freezing points.

Two of the greases, DC 31 and DC 41, containing no graphite, are compounded almost entirely of inorganic materials and are black in color due to use of carbon black as a thickening agent. Although they possess exceptional thermal stability, they show a slight tendency to bleed during storage, which, it is asserted, does not impair the performance. They are corona resistant and are semi-conducting, the conductivity being in the order of 1000 ohm centimeters.

The other two greases, DC 33 and DC 44, are light brown and are compounded with metallic soaps selected for their heat stability. They are said to be serviceable at temperatures as high as the melting points of metallic soaps and show little tendency to bleed.

Of the four greases, DC 31 and DC 33 are designed for low temperature lubrication and DC 41 and DC 44 for high temperature service

Ventilation Article Author

The article in the March 11, issue of STEEL, page 98, on "Mill Building Ventilation" was credited to Dave Henderson, sales engineer, Heater Department, Dravo Corp., Pittsburgh. The article actually was written by Bertram B. Reilly, sales engineer of the same department.

Harden it for 10¢ with TOCCO

PROGRESSIVE *Kearney & Trecker Corp.*, Milwaukee, Wisc., reports the following savings by TOCCO hardening the above saddle clamp eccentric of their Milwaukee Milling Machine:

	FORMER METHOD	TOCCO
Heat treating	$ 0.721	$ 0.099
Straightening	0.752	0.000
Cleaning	0.100	0.000
Total Cost	$ 1.573	$ 0.099

Saving . . . $1.47 per piece

In addition to this saving of $1.47 per piece, TOCCO made possible a switch from alloy steel to S.A.E. 1045 steel, saving $0.110 in material cost per piece.

Total saving on each run of 1375 pieces for this one part is $2,172.50.

Kearney & Trecker hardens a total of 140 different parts on one "TOCCO JR." machine. Output of some parts has been increased as much as 500%.

Why not enlist TOCCO's experienced Engineers to help you obtain similar improvements for *your* production? New booklet, "Results with TOCCO", gives ideas for hardening, brazing, annealing, heating by TOCCO Induction.

THE OHIO CRANKSHAFT COMPANY

TOCCO

— MAIL COUPON FOR BOOKLET —

The Ohio Crankshaft Co.
Dept. S, Cleveland 1, Ohio

Send free Copy "Results with TOCCO"

Name _____

Company _____

Address _____

City _____ Zone ____ State _____

Induction Heating

(*Continued from Page* 107)

of 100 kw per square in. These and even higher power concentrations are possible with the use of the upper frequencies.

To be sure, the higher frequencies can be used also for the furnace type of application. In fact, for heating small objects, such as dowel pins ¼-in. or less in diameter, the high frequencies are necessary even at relatively low-power concentrations. Also in special cases, such as are found in tube manufacture where electronic generators are more convenient and available, the high frequencies are favored. But, in general, the low frequencies (10,000 cycles per sec and less) are at present more economical for the furnace class of induction heating.

High Power Concentration Requires Special Coupling Circuits as Well as High Frequencies

While it is necessary, high frequency alone is not sufficient to produce high power concentrations. The proper coupling circuits and applicator arrangements are equally important. These preferred coupling circuits are relatively costly and, therefore, at present few manufacturers are providing them as standard equipment on their electronic power generators.

When power is to be concentrated in a small area, the applicator which couples energy into that area has necessarily a low electrical impedance. On the other hand, the output circuit of an electronic tube is classed as a high-impedance device. Therefore, some sort of matching circuit is necessary to couple energy with moderate efficiency from the tube, through the applicator and into the work. Probably the simplest device for this purpose is an isolated secondary transformer, such as is shown in Fig. 1. Some setups for using the high-power concentration techniques are illustrated in the accompanying photographs (Figs. 2 and 3).

Value in Case Hardening

High power concentration technique is especially valuable for case hardening, since the more nearly a piece can be self-quenched, the less are the surface stresses which are developed. In the more common method of quenching, in which a coolant is sprayed on a heated body, the outer layers are chilled first and tend to contract upon the hotter, inner layers. But in self-quenching only a thin layer is heated and this is cooled from the inside out, thus reducing strains and distortion to a minimum.

To be sure, many pieces cannot be completely self-quenched due to their having too high a ratio of heated surface

to volume. Nevertheless the high-intensity, short heating time technique is still valuable, even though the part finally must be immersed in a liquid to complete the quench.

Results of this high-intensity technique in the surface hardening of carbon steel are shown in Figs. 4 to 10 inclusive. The work samples were in the form of solid cylinders 0.90-in. in diameter and ¾-in. long. The applicator was a single turn of 3/16-in. copper tubing with an annular spacing between the work and the applicator of 1/16-in. The cylinder was moved through this loop and into a vessel of water at speeds ranging from 0.8-in. per sec to 4.5-in. per sec. The powers applied to the work were varied so that the surface temperature was approximately the same in each case (between 1500° F and 1800° F). The frequency used was approximately 400 kilocycles per sec.

Self Conduction Rapid

A sample of SAE-1050 steel was heated at a scanning rate of 1.6-in. per sec with a power of 30 kw into the work (Fig. 4). This is a power concentration of about 65 kw per square in. The photograph was made at a magnification of 460X and the maximum hardness of 780 Knoop corresponds to about 63 rockwell C. The surface of the water bath was ¼-in. below the center of the heating coil, but self conduction was so rapid that the work was no longer incandescent when it reached the water.

In Fig. 5 the sample was again 1050 steel. The power concentration was about 85 kw per square in. and the scanning speed was 4.5-in. per sec. Although the hardness was near the maximum possible for the steel used, the 460X photomicrograph shows much undissolved carbide in the shell.

Another sample of the same steel was run at 4.5-in. per sec, but at a power concentration of 110 kw per square in. (Fig. 6). The shell is about 3 times as thick as that in the sample of Fig. 5. The photomicrographs show plainly a martensitic structure, but close examination also shows that even at this power the carbides in some areas were not completely dissolved. Indications are, however, that if the power concentration has been increased a bit, there would have been a complete dissolution of the carbides, even though the heating time at any one point was not more than 0.035 sec. The maximum hardness (780 Knoop) corresponds to approximately 63 rockwell C.

A similar sample of steel, shown in Fig. 7, was heated at the same power and scanning speed, but was quenched by self-conduction alone. The depth of hardened shell is approximately equal to

that of the sample shown in Fig. 6, but the maximum hardness corresponds to only about 58 rockwell C. The temperature immediately after equalization was approximately 500° F. Had the radius of the sample been somewhat larger, this "final temperature" would, of course, have been less—perhaps low enough to produce full hardness. The photomicrographs also show a structure which is typical of the manner in which the temperature was reduced.

An interesting comparison can be made with the samples shown in Figs. 8 and 9. In Fig. 8 a scanning method was used as with the samples described above. In this case, however, the speed was 0.8-in. per sec and the power concentration was about 40 kw per square in. The quenching medium was water with its surface ¼-in. below the center of the applicator loop. The photomicrographs show a fully hardened, martensitic structure in a shell approximately one mm (0.040-in.) thick.

Different Technique Used

In the sample illustrated in Fig. 9 a different technique was used. The applicator consisted in a three-turn inductor coil spaced the same distance from the sample as that in Fig. 8. The three turns covered the sample practically from end to end. The same power was applied to the work as before, but the time of heating was 0.9 sec. Under these conditions the same total energy was put into the sample as when the work was scanned. In this case the quench was a spray of water. Therefore, the principal difference in heating of the samples shown in Fig. 8 and Fig. 9 was that in the former instance the power concentration was approximately 40 kw per square in. and the heating time was about 0.19 sec, while in the latter case the power concentration averaged about 8.5 kw per square in. for 0.9 sec. Because of the rapid heat conduction in the metal, the surface temperature in the stationary heating did not reach as high a value as when the work was scanned. The micrographs show that although the hardened shells are nearly the same thickness, the hardness is less for the stationary heating. Also, there are microscopic soft spots due to inadequate solution of the carbides. Such experiments show conclusively that "time of heating" is not so important as temperature when full hardness and a martensitic structure are desired.

The results of heating a sample of SAE-1090 steel in the spheroidized state may be seen in Fig. 10. The power concentration was 100 kw per square in., the quench was a water surface ¼-in. below the coil, and the scanning speed was 2.41-in. per sec. This corresponds to a

heating time of about 0.06 sec for each point on the surface.

Temperature Measurements

The factor of temperature is extremely important in the process of surface hardening at high speeds, as proved by repeated experiments. Consequently it is unfortunate that no very good method has yet been devised to measure these temperatures. If a thermocouple is used there is considerable doubt that it could be so designed and placed that its temperature would be the same as that of the surrounding surface layers. Moreover, the best of recording galvanometers will indicate the thermal e.m.f.'s with only a fair degree of accuracy when the heating times are in the order of a few hundredths of a second. In fact, the heating times are so short that optical pyrometers are of little use even in the scanning type of heating.

The "Scanning" Technique

When extended areas are to be heated at high power concentrations, the scanning technique mentioned above can often be used. Cylindrical objects (such as piston pins or dowel pins) are ideally suited for this method. For example, ½-in. dowel pins are poured into a hopper from which they are guided through the single-turn applicator coil and thence into a water bath which completes the quench (Fig. 11). (The handling equipment shown in the photo was designed and built by the Link Belt Co.) The pins shown in the illustration are 2¼-in. long and are handled at the rate of one per sec with a power of 30 kw in the work.

Soldering and Brazing

For soldering and brazing operations, the extremely high power concentrations are seldom used—the reason being that in the general case it is too difficult to maintain the necessary uniformity of heating. Only in those cases in which the work is cylindrical and of uniform cross-section can extreme power concentrations be used. Sometimes, however, it is desirable to silver-solder at a point near a part whose temperature must be kept relatively low, as, for example, the fabricating of spring assemblies. In such cases the high precision with which a heated area can be defined makes mandatory the use of the higher frequencies and medium to high power concentration.

Conclusion

In drawing a general conclusion, it may be said that there are many heating applications which are not adaptable to high-frequency induction heating. There are many others in which induction heating is indicated, and in which a wide

choice of frequency and type of generator is available. Nevertheless, there are also many applications in which the higher frequencies used in high-power concentrations are an absolute necessity.

For surface hardening of carbon steel high power concentrations and fast heating times are capable of producing a fully hard martensitic structure. And apparently the limiting factor is the temperature which can be attained rather than a necessary "soaking" time.

It should be kept in mind that equipment which will produce high power concentrations will do an entirely different type of work from one which is designed for general, over-all heating.

Too often one type of equipment is used on a job where it is entirely unsuitable and for which another type of equipment and technique might be the precise answer. Design and process engineers should, therefore, study the many methods and techniques which are available in induction heating with a view to determining which is best for the application they have in mind. Development in this form of industrial heating is progressing steadily and in an increasing number of applications. It will undoubtedly take its place as an accepted standard practice as industrial heating problems to which it is adapted arise.

Story of Tin Can's Making Told in Color Pictures

How tin cans are made—starting with the mining of iron ore and continuing through the blast furnace, open hearth, the continuous strip mill, electrolytic tinning line—is explained in the February issue of the Employees Bulletin of the Weirton Steel Co., Weirton, W. Va., entitled, "Tin Plate Edition, 1946."

Forty-seven Kodochrome illustrations, many of them full page (11 x 14 in.), are employed to depict the various steps involved in the production. A history of the Weirton company also is included in the bulletin.

One of the many interesting sidelights of the Weirton company is that its tin mill was almost wrecked in 1913 by a landslide, when 250,000 cu yd of dirt and rock crashed down on the engine and boiler house. Hundreds of men and machines and all available teams of horses and mules worked day and night from May until September, when finally the slide was licked. This disaster cost $600,000, but the mills maintained constant operation throughout the summer with makeshift engines and boilers hastily set up in an open field.

the BUSINESS TREND

REFLECTING improved steel production, STEEL's industrial production index has risen slightly above the level prevailing immediately prior to the start of the recent month-long strike in the steel industry. For the week ended March 9 the index registered 120 per cent (preliminary), compared with 117 for the week ended Jan. 19, the week before the strike.

AUTOS—A contributing factor, though small, to the rise in the latest week's index is a 31 per cent increase in automobile production during the week ended March 9 over the previous week. Assemblies in the week ended March 9 totaled 23,050, compared with 17,575 in the week ended March 2. Fifty-six per cent of the assemblies in the week ended March 9 came from Chrysler Corp.

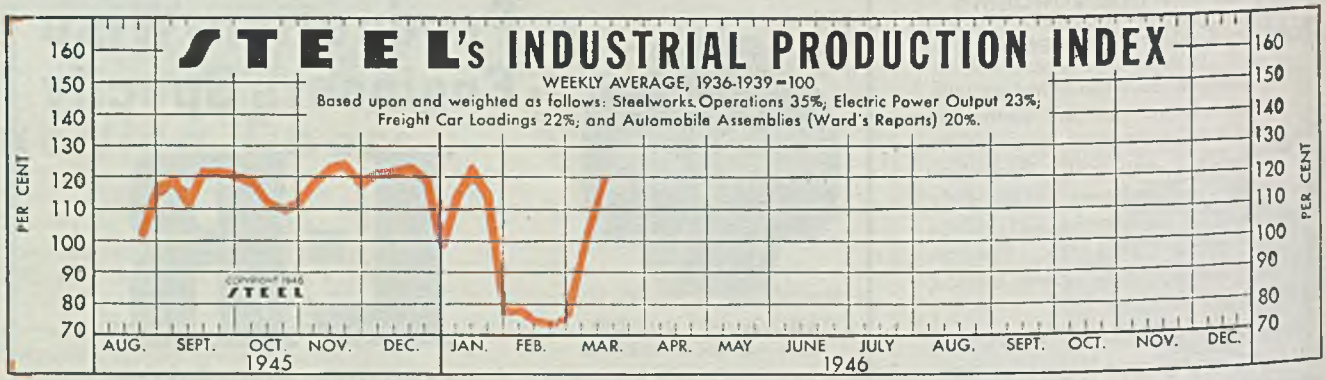
COAL—Bituminous coal production of 12,500,000 tons in the week ended March 2 was slightly under the 12,610,000 tons of the previous week. Output through March 2 this year was 2.9 per cent ahead of the corresponding time last year, but this trend will be reversed if a threatened strike of miners occurs.

PRICES—Higher prices for iron and steel products in primary markets more than offset price declines for agricultural commodities during the week ended March 2, and the result was a 0.2 per cent rise over the previous week in the Bureau of Labor Statistics index of commodity prices in primary markets. The index in the week ended March 2 was 107.6 per cent of the 1926 average. This was 0.7 per cent above early February, 1946, and 2.5 per cent above the corresponding week of last year. If prices for all commodities other than iron and steel had remained unchanged during the week, the advance in prices of basic steels would have raised the all-commodities index by 0.3 per cent instead of 0.2 per cent.

STOCKS—A strong spirit of caution in Wall Street is making for a selective market. Meanwhile, in some quarters it is believed that the Dow-Jones average of industrial stocks may stage a 50 per cent recovery, which would make the average 196 plus, but some believe a sharp test of the February lows might come later. Others believe that the lows of the decline have been reached and that the market is as susceptible to good news as it was to displeasing news when the break started in February.

RAILROADS—Declining 20 per cent under January, 1945, estimated net income (after interest and rentals) of Class I railroads in January, 1946, was $31 million. In January, 1945, it was $39,048,188.

CONSTRUCTION COSTS—Continuing its upward trend, the Federal Home Loan Bank Administration's combined index of cost of constructing a six-room frame house rose in January to 138.2 per cent of the 1935-1939 average. The index for January, 1945, was 134.5 and for December, 1945, 137.9 per cent.



The Index (see chart above): Latest Week (preliminary) 120 Previous Week 105 Month Ago 75

FIGURES THIS WEEK

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)	77.5	56	5.5	95
Electric Power Distributed (million kilowatt hours)	3,953	4,000	3,983	4,446
Bituminous Coal Production (daily av.—1000 tons)	2,083	2,100	2,083	1,880
Petroleum Production (daily av.—1000 bbls.)	4,403	4,726	4,690	4,768
Construction Volume (ENR—Unit $1,000,000)	$68.4	$96.8	$55.5	$41.9
Automobile and Truck Output (Ward's—number units)	23,050	17,575	23,785	20,235

*Dates on request.

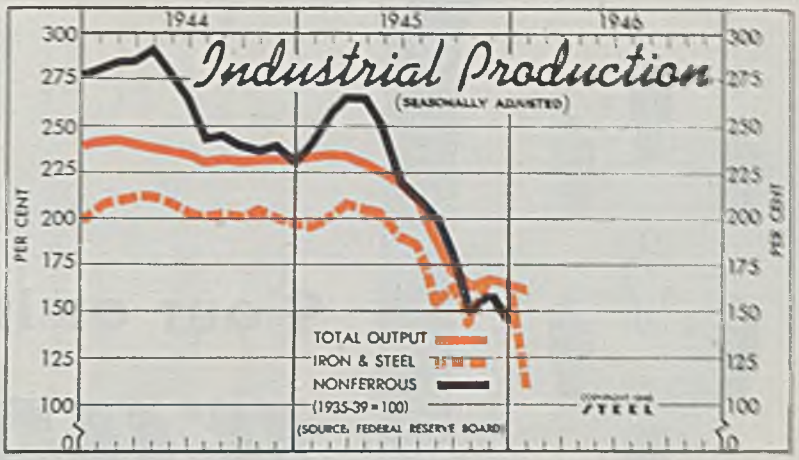
TRADE				
Freight Carloadings (unit—1000 cars)	824†	782	713	766
Business Failures (Dun & Bradstreet, number)	22	15	27	21
Money in Circulation (in millions of dollars)‡	$27,957	$27,938	$27,929	$25,864
Department Store Sales (change from like week a year ago)‡	+19%	+20%	+20%	+19%

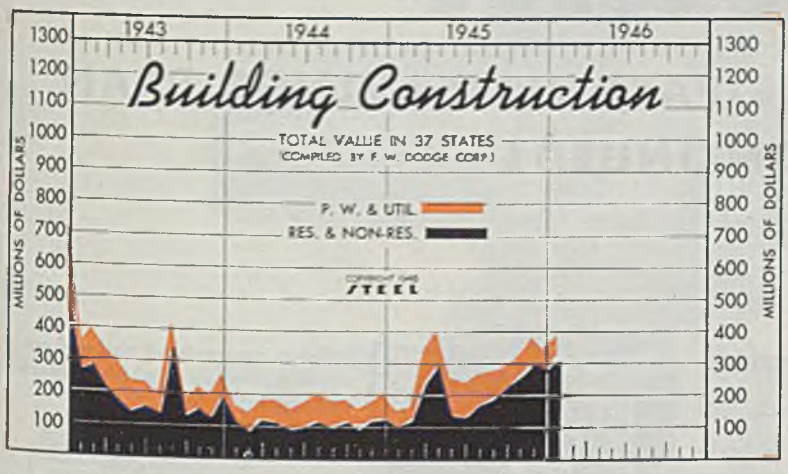
†Preliminary. ‡Federal Reserve Board.

Federal Reserve Board's Production Indexes

(1935-39=100)

	Total Production		Iron & Steel		Nonferrous	
	1946	1945	1946	1945	1945	1944
Jan.	159	234	105	197	240	281
Feb.	...	236	...	202	237	285
Mar.	...	235	...	210	265	286
Apr.	...	231	...	206	264	292
May	...	226	...	204	251	279
June	...	220	...	192	219	264
July	...	211	...	187	210	243
Aug.	...	187	...	155	198	245
Sept.	...	171	...	163	176	239
Oct.	...	163	...	146	147	236
Nov.	...	168	...	162	159	239
Dec.	...	164	...	165	144	229
Avge.	...	204	...	183	211	260





Construction Valuation in 37 States

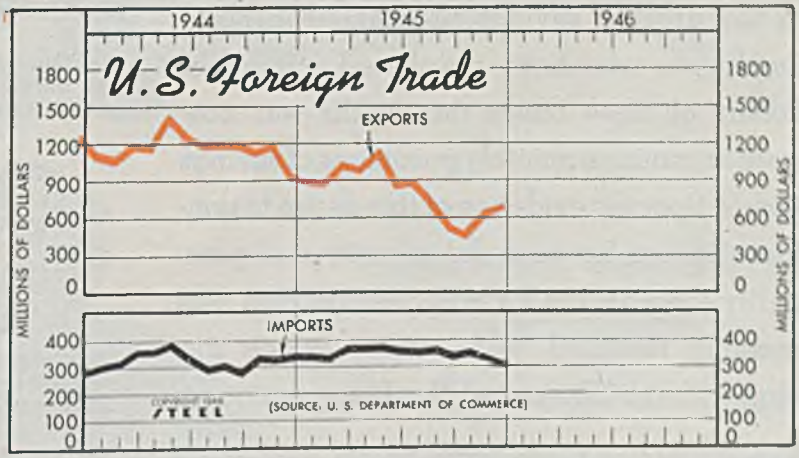
(Unit—$1,000,000)

	Total	Public Works-Utilities		Residential and Non-Residential	
	1946	1946	1943	1946	1943
Jan.	357.5	50.2	89.8	307.3	161.2
Feb.	....	...	82.0	....	113.0
Mar.	....	...	90.6	....	238.3
Apr.	....	...	111.9	....	283.9
May	....	...	107.9	....	134.3
June	....	...	93.0	....	182.3
July	....	...	89.9	....	167.8
Aug.	....	...	77.3	....	186.1
Sept.	....	...	54.6	....	223.6
Oct.	....	...	61.1	....	233.3
Nov.	....	...	74.0	....	296.0
Dec.	....	...	51.0	....	279.7
Tot'l	....	...	885.3	....	2,414.0

Foreign Trade
Bureau of Foreign and Domestic Commerce

(Unit Value—$1,000,000)

	Exports			Imports		
	1945	1944	1943	1945	1944	1943
Jan.	901	1,124	730	334	300	228
Feb.	882	1,086	719	324	313	234
Mar.	1,030	1,197	988	365	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	893	1,198	1,262	356	293	300
Aug.	737	1,207	1,204	360	302	315
Sept.	515	1,199	1,235	335	280	285
Oct.	455	1,140	1,195	344	327	329
Nov.	639	1,184	1,074	322	322	317
Dec.	736	934	1,244	301	336	281
Total	9,789	14,141	12,718	4,139	3,907	3,372



FINANCE

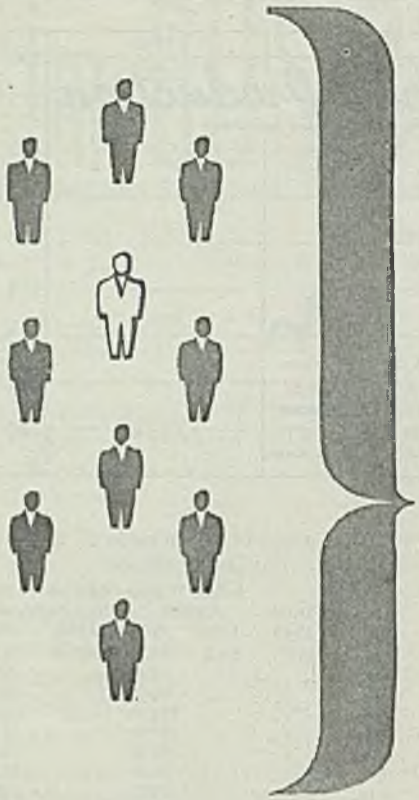
	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$12,030	$9,838	$11,736	$10,929
Federal Gross Debt (billions)	$278.7	$279.7	$279.4	$235.0
Bond Volume, NYSE (millions)	$24.5	$32.2	$34.8	$53.3
Stocks Sales, NYSE (thousands)	5,226	8,948	8,754	5,966
Loans and Investments (billions)†	$68.1	$68.2	$68.2	$58.5
United States Gov't. Obligations Held (millions)†	$49,518	$49,586	$49,656	$43,912

†Member banks, Federal Reserve System.

PRICES

	Latest Period*	Prior Week	Month Ago	Year Ago
STEEL's composite finished steel price average	$64.45	$64.45	$58.27	$57.55
All Commodities†	107.6	107.4	106.8	105.0
Industrial Raw Materials†	119.5	119.7	118.9	116.2
Manufactured Products†	103.7	103.4	102.9	101.6

†Bureau of Labor Statistics Index, 1926 = 100.



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Every employer can write in his own set of reasons why the Payroll Savings Plan should be continued as a part of his personnel relations program, but the principal advantages are obvious:

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An "automatic" thrift habit for the worker; to increase contentment and satisfaction in his job.

An opportunity for the employee to maintain his "share in America" with the safest, easiest, most profitable investment he can make.

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The Treasury Department acknowledges with appreciation the publication of this message by

STEEL

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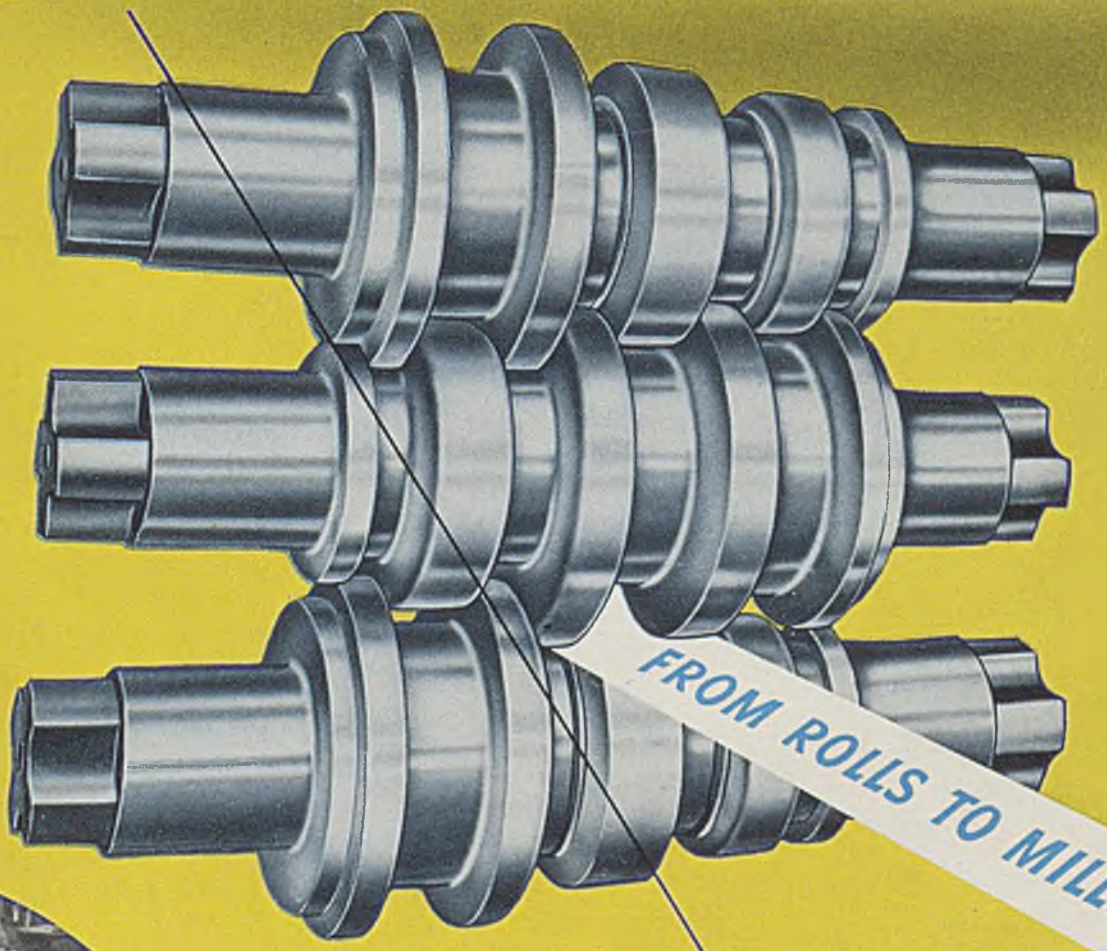
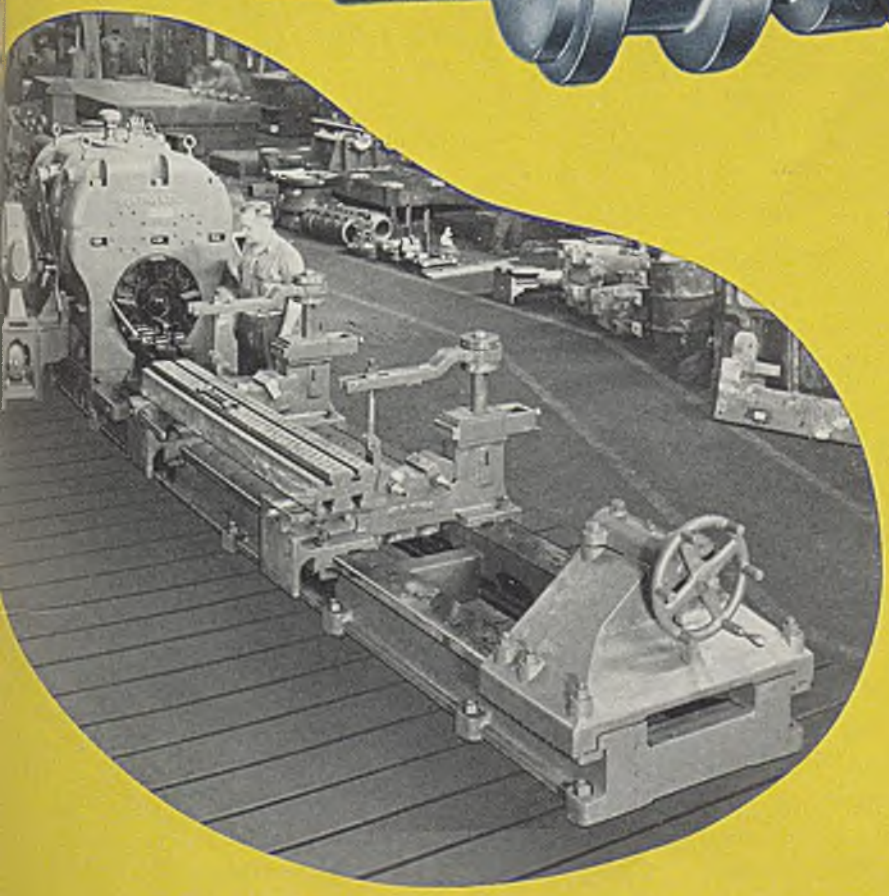


FROM ROLLS TO MILLS



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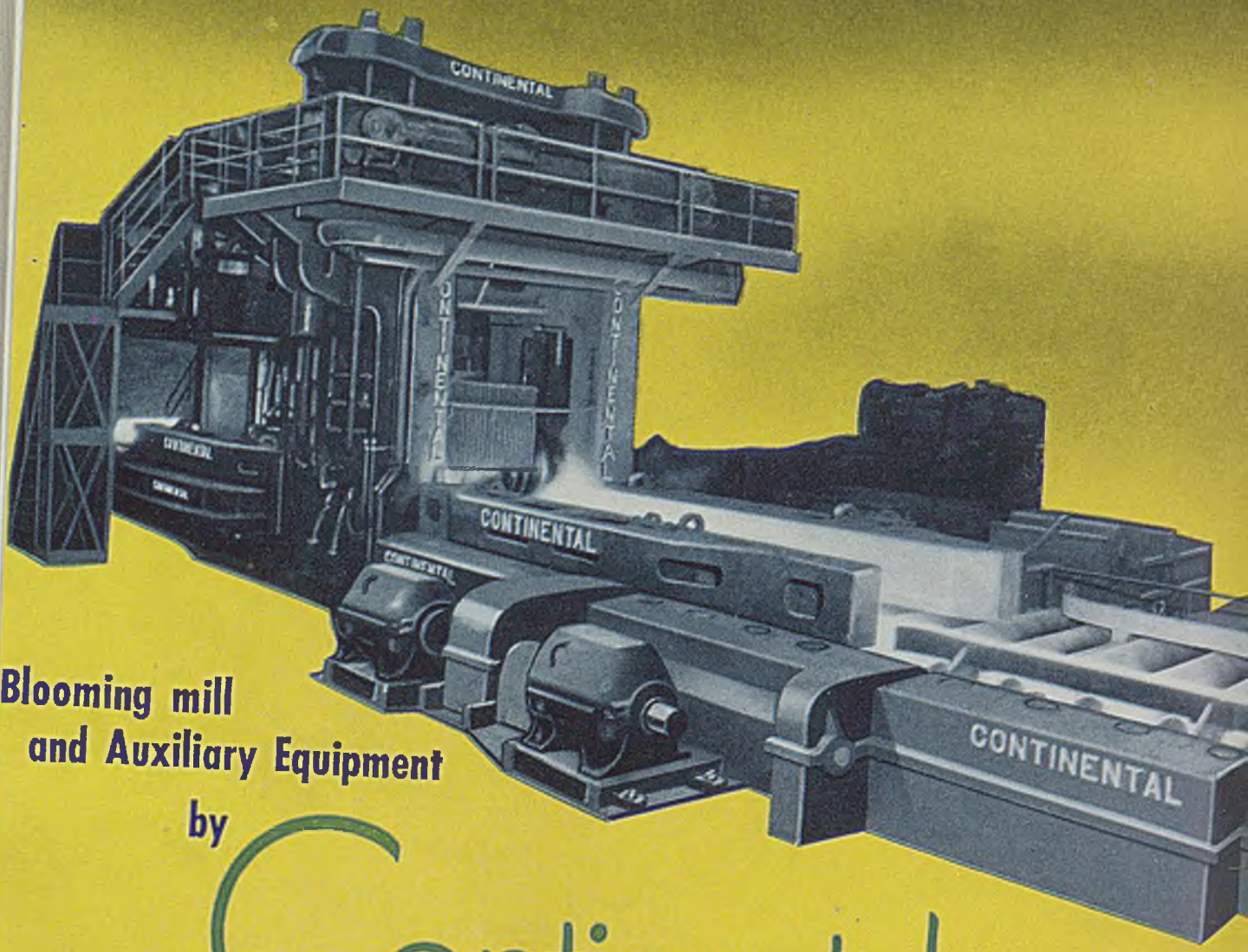

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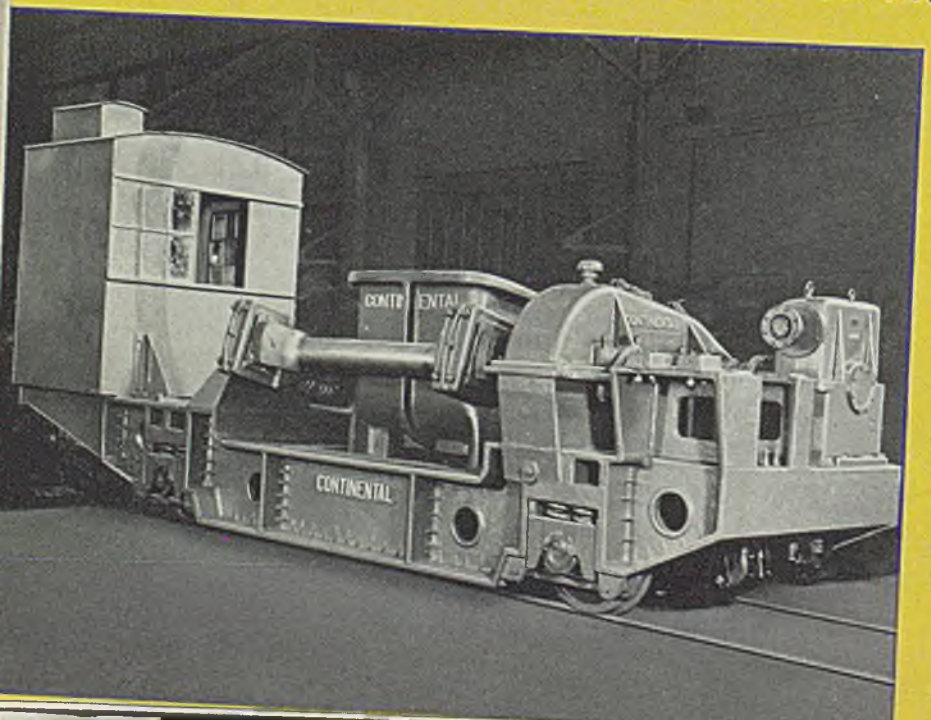

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MARKET SUMMARY

More Steel for Industry As Mills Regain Stride

Pressure for deliveries intense . . . Most products sold through year . . . Further price changes expected . . . Pig iron shortage hampers

STEEL production continues to expand and has reached approximately the level prevailing before the steel strike, assuring a larger supply of steel to consuming industries for the remainder of the year.

Most steel plants now are in operation and hindrances developing in getting under way after the idle period are being eliminated rapidly, production gaining momentum each week. Were it not for shortage of pig iron, steel output would be at a higher level. While leaving much to be desired, as many consuming plants are down all over the country, the overall gain in consumer operations is clearly reflected in increasing pressure for steel. At no time in months has demand appeared more urgent and in spite of acceleration in steel production supply continues tight.

It is practically impossible for buyers to place new tonnage in any major product before fourth quarter and in some specialties before the end of the year, which really means not at all as few producers will book tonnage for 1947. Steel consumers are gaining a better idea of where they stand, as producers are in better position to know what they can do, barring further disruptions, such as a strike in the soft coal industry.

Mills dividing their output on a quota basis have reduced quotas in some instances. Some have virtually canceled all commitments for the final two months of the year, to offset losses due to the strike and attending effects, indicating that these commitments will come up for review later, possibly to be rescheduled during the first two months next year. Other producers have made somewhat different adjustments.

Some confusion has arisen over application of the recent price increases granted by Office of Price Administration and some changes are likely to be made to fit conditions better. Expectation is that an increase in pig iron prices will be made soon, with indications that it will be 75 cents per ton, though nothing official has been announced. Adjustments in increases on alloys and tin plate are said to be under consideration and some further increases may be announced within the five weeks allowed OPA for completing the revision.

Settlement of several major strikes at consuming plants will increase demand for steel, which will increase the tight supply situation despite the rise in steel output.

Greatest drawback to steel production rests in short supply of pig iron which, in turn, is reflected in increased demand for scrap, which is in short supply. The scrap bureau of the CPA estimates that monthly scrap deficits are 100,000 to 200,000 tons, to meet estimated needs of consumers, resulting in heavy drain on pig iron. It is stated at least two million tons are needed to bring inventories back into line. Another country-wide collection program may be undertaken to fill this gap.

Steel ingot production rose again last week to an estimated national rate of 84½ per cent of capacity, matching prestrike rates and bettering figures of late months in 1945. Pittsburgh gained 4½ points to 92½ per cent, Chicago 11½ points to 85½, eastern Pennsylvania 4 points to 77, Youngstown 10 points to 85, Cleveland 4½ points to 93, Buffalo 12 points to 75, Birmingham 9 points to 95, Detroit 2 points to 90, St. Louis 4½ points to 67½, New England 1 point to 88. Cincinnati dropped 5 points to 76 and Wheeling declined 4½ points to 86. Pacific Coast plants last week operated an average of 78½ per cent of capacity.

Effect of the recent steel strike on steel ingot production is shown in the report of the American Iron & Steel Institute for January and February. In the former month output of steel for castings totaled 3,869,076 net tons, an average rate of 49.6 per cent of capacity; in February output was 1,353,074 tons, at 19.2 per cent of capacity. These figures compare with output of 5 to 7 million tons per month during 1945.

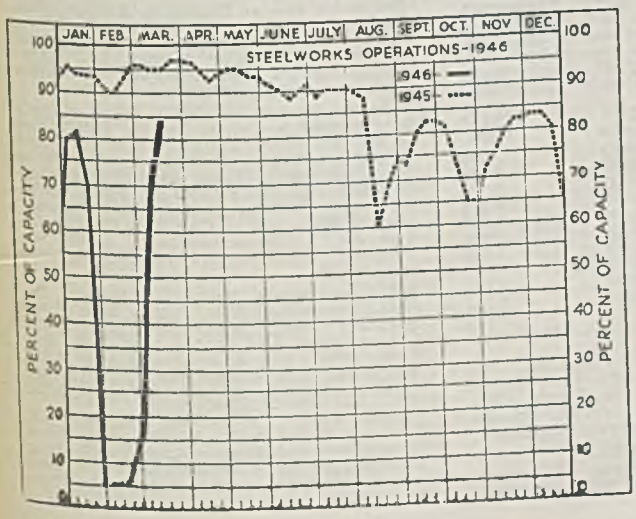
Average composite prices of steel and iron products are steady at the new ceilings recently announced by OPA. Finished steel composite is $64.45, semifinished steel $40.60, steelmaking pig iron $24.80 and steelmaking scrap $19.17.

DISTRICT STEEL RATES

(Percentage of Ingot Capacity Engaged in Leading Districts)

	Week Ended Mar. 16	Change	Same Week 1945	Same Week 1944
Pittsburgh	92.5	+ 4.5	89	93.5
Chicago	85.5	+11.5	99.5	100.5
Eastern Pa.	77	+ 4	92	94
Youngstown	85	+10	92	95
Wheeling	86	— 4.5	93.5	95.5
Cleveland	93	+ 4.5	91.5	94
Buffalo	75	+12	93	90.5
Birmingham	95	+ 9	95	95
New England	88	+ 1	92	92
Cincinnati	76	— 5	72	88
St. Louis	67.6	+ 4.5	80	74
Detroit	90	+ 2	86	86
Estimated national rate	84.5	+ 7	95	98

*Based on steelmaking capacities as of these dates.



COMPARISON OF PRICES

	Mar. 16	Mar. 9	Mar. 2	One Month Ago Feb. 1946	Three Months Ago Dec. 1945	One Year Ago Mar. 1945	Five Years Ago Mar. 1941
Finished Steel	$64.45	$64.45	$64.45	$61.36	$58.27	$57.55	$56.73
Semifinished Steel	40.60	40.60	40.60	39.20	37.80	36.00	36.00
Steelmaking Pig Iron	24.80	24.80	24.80	24.80	24.25	24.05	23.05
Steelmaking Scrap	19.17	19.17	19.17	19.17	19.17	19.17	20.15

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for last Month, Three Months and One Year Ago

Finished Material, cents per lb.; coke, dollars per net ton; others dollars per gross ton.

Finished Material	Mar. 16 1946	Feb., 1946	Dec., 1945	Mar., 1945
Steel bars, Pittsburgh	2.50c	2.375c	2.25c	2.15c
Steel bars, Philadelphia	2.82	2.695	2.57	2.47
Steel bars, Chicago	2.50	2.375	2.25	2.15
Shapes, Pittsburgh	2.35	2.275	2.10	2.10
Shapes, Philadelphia	2.465	2.340	2.215	2.215
Shapes, Chicago	2.35	2.225	2.10	2.10
Plates, Pittsburgh	2.50	2.375	2.25	2.20
Plates, Philadelphia	2.55	2.425	2.30	2.25
Plates, Chicago	2.50	2.375	2.25	2.20
Sheets, hot-rolled, Pittsburgh	2.425	2.3125	2.20	2.20
Sheets, cold-rolled, Pittsburgh	3.275	3.165	3.05	3.05
Sheets, No. 24 galv., Pittsburgh	4.05	3.875	3.70	3.65
Sheets, hot-rolled, Gary	2.425	2.3125	2.20	2.20
Sheets, cold-rolled, Gary	3.275	3.165	3.05	3.05
Sheets, No. 24 galv., Gary	4.05	3.875	3.70	3.65
Hot-rolled strip, over 6 to 12-in., Pitts.	2.35	2.225	2.10	2.10
Cold-rolled strip, Pittsburgh	3.05	2.925	2.80	2.80
Bright bess., basic wire, Pittsburgh	3.05	2.90	2.75	2.60
Wire nails, Pittsburgh	3.25	3.075	2.90	2.80
Tin plate, per base box, Pittsburgh	$5.25	$5.125	$5.00	$5.00
Semifinished Material				
Sheet bars, Pittsburgh, Chicago	$38.00	$37.00	$36.00	$34.00
Slabs, Pittsburgh, Chicago	39.00	37.50	36.00	34.00
Rerolling billets, Pittsburgh	39.00	37.50	36.00	34.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	2.30c	2.225c	2.15c	2.00c

Pig Iron	Mar. 16, 1946	Feb., 1946	Dec., 1945	Mar., 1945
Bessemer, del. Pittsburgh	$26.94	$26.94	$26.94	$26.19
Basic, Valley	25.25	25.25	25.25	24.50
Basic, eastern del. Philadelphia	27.09	27.09	27.09	26.34
No. 2 fdry., del. Philadelphia	27.59	27.59	27.59	26.84
No. 2 foundry, Chicago	25.75	25.75	25.75	25.00
Southern No. 2, Birmingham	22.13	22.13	22.13	21.38
Southern No. 2 del. Cincinnati	26.05	26.05	26.05	25.30
No. 2 fdry., del. Philadelphia	27.59	27.59	27.59	26.34
Malleable, Valley	25.75	25.75	25.75	25.00
Malleable, Chicago	25.75	25.75	25.75	25.00
Lake Sup., charcoal del. Chicago	37.34	37.34	37.34	37.34
Gray forge, del. Pittsburgh	25.94	25.94	25.94	25.19
Ferromanganese, del. Pittsburgh	140.00	140.00	140.00	140.33
Scrap				
Heavy melting steel, No. 1, Pittsburgh	$20.00	$20.00	$20.00	$20.00
Heavy melt. steel, No. 2, E. Pa.	18.75	18.75	18.75	18.75
Heavy melting steel, Chicago	18.75	18.75	18.75	18.75
Rails for rolling, Chicago	22.25	22.25	22.25	22.25
No. 1 cast, Chicago	20.00	20.00	20.00	20.00
Coke				
Connellsville, furnace ovens	$7.50	$7.50	$7.50	$7.00
Connellsville, foundry ovens	8.25	8.25	8.25	7.75
Chicago, by-product fdry, del.	13.35	13.75	13.75	13.35

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Following are maximum prices established by OPA Schedule No. 6 issued April 16, 1941, revised June 20, 1941, Feb. 4, 1942, May 21, 1945, Mar. 1, 1946. Schedule covers iron or steel ingots, semifinished iron or steel products, finished hot-rolled, cold-rolled iron or steel products and any iron or steel product which is further finished by galvanizing, plating, coating, drawing, extruding, etc., although only principal established basing points for selected products are named specifically. Seconds and off-grade products are also covered. Exceptions applying to individual 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, $33.

Alloy Steel Ingots: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon; uncrop, $46.80.

Rerolling, Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, $39; Detroit, del., $41; Duluth (bil), $41; Pac. ports (bil), $51. (Andrews Steel Co., carbon slabs, $41; Northwestern Steel & Wire Co., $41, Sterling, Ill.; Granite City Steel Co. $47.50 gross ton slabs from D.P.C. mill. Geneva Steel Co. $58.64, Pac. ports.)

Forging Quality Blooms, Slabs, Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $47; Detroit, del., $49; Duluth, billets, $49; forg. bil. f.o.b. Pac. ports, $59.

(Andrews Steel Co. may quote carbon forging billets $50 gross ton at established basing points; Follansbee Steel Corp., $49.50 f.o.b. Toronto, O. Geneva Steel Co. $64.64, Pacific ports.)

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $56.16, del. Detroit $58.16, eastern Mich. $59.16.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $38. (Empire Sheet & Tin Plate Co., Mansfield, O., carbon sheet bars, $39, f.o.b. mill.)

Skelp: Pittsburgh, Chicago, Sparrows Point, Youngstown, Coatesville, lb., 2.05c.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, No. 5—$\frac{9}{32}$ in. inclusive, per 100 lbs., $2.30. Do., over $\frac{9}{32}$—$\frac{47}{64}$-in., incl., $2.45; Galveston, base, $2.40 and $2.55, respectively. Worcester add $0.10; Pacific ports $0.50 (Pittsburgh Steel Co., $0.05 higher.)

Bars

Hot-Rolled Carbon Bars and Bar-Size Shapes under 3: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham base, 20 tons one size, 2.50c; Duluth, base, 2.60c; Detroit, del., 2.60c; eastern Mich., 2.65c; New York, del., 2.84c; Phila., del., 2.82c; Gulf ports, dock; 2.87c; Pac. ports, dock, 3.15c. (Calumet Steel Division, Borg-Warner Corp., and Joslyn Mfg. & Supply Co., may quote 2.55c, Chicago base; Sheffield Steel Corp., 2.75c, f.o.b. St. Louis.)

Rail Steel Bars: Same prices as for hot-rolled carbon bars except base is 5 tons.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 2.92c; Detroit, del., 3.02c. (Texas Steel Co. may use Chicago base price as maximum f.o.b. Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

AISI Series	(*Basic O-H)	AISI Series	(*Basic O-H)
1300	$0.104	4300	1.768
2300	1.768	4600	1.248
2500	2.652	4800	2.236
3000	0.52	5100	0.364
3100	0.884	5130 or 5152	0.468
3200	1.404	6120 or 6152	0.988
3400	3.328	6145 or 6150	1.248
4000	0.468	8612	0.676
4100 (.15-.25 Mo)	0.728	8720	0.728
(.20-.30 Mo)	0.78	9830	1.352

* Add 0.25 for acid open-hearth; 0.50 electric.

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 20,000-39,999 lbs., 3.10c; Detroit, 3.15c; Toledo, 3.25c.
Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 3.48c; Detroit, del., 3.58c; eastern Mich., 3.63c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.35c; Detroit, del., 2.45c; eastern Mich. and Toledo, 2.50c; Gulf ports, dock, 2.70c; Pacific ports, dock, 2.75c.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo, base, 2.35c; Detroit, del., 2.45c; eastern Mich. and Toledo, 2.50c; Gulf ports, dock, 2.70c.

Iron Bars: Single refined, Pitts., 4.76c; double refined, 5.84c; Pittsburgh, staybolt, 6.22c; Terre Haute, single ref., 5.42c; double ref., 6.76c.

Sheets, Strip

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Pt., Middletown, base, 2.425c; Granite City, base, 2.525c; Detroit, del., 2.525c; eastern Mich., 2.575c; Phila., del., 2.595c; New York, del., 2.665c; Pacific ports, 2.975c.

(Andrews Steel Co. may quote hot-rolled sheets for shipment to Detroit and the Detroit area on the Middletown, O., base; Alan Wood Steel Co., Conshohocken, Pa., may quote 2.60c on hot carbon sheets, nearest eastern basing point.)
Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.275c; Granite City, base, 3.425c; Detroit, del., 3.375c; eastern Mich., 3.425c; New York, del., 3.615c; Phila., del., 3.595c; Pacific ports, 3.925c.

Galvanized Sheets, No. 24: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base, 4.05c; Granite City, base, 4.15c; New York, del., 4.29c; Phila., del., 4.13c; Pacific ports, 4.60c.
Corrugated Galv. Sheets: Pittsburgh, Chicago, Gary, Birmingham, 29-gage, per square, 3.75c.

Culvert Sheets: Pittsburgh, Chicago, Gary, Birmingham, 16-gage not corrugated, copper alloy, 4.11c; Granite City, 4.22c; Pacific ports, 4.60c; copper iron, 4.22c; pure iron, 4.27c; zinc-coated, hot-dipped, heat-treated, No. 24, Pittsburgh, 4.60c.

Enameling Sheets: 10-gage; Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base 3.20c; Granite City, base 3.30c; Detroit, del., 3.30c; eastern Mich., 3.35c; Pacific ports, 3.85c; 20-gage: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base, 3.80c; Detroit, del., 3.90c; eastern Mich., 3.95c; Pacific ports, 4.45c.

Electrical Sheets No. 24:

	Pittsburgh Base	Pacific Ports	Granite City
Field grade	3.90c	4.65c	4.00c
Armature	4.25c	5.00c	4.35c
Electrical	4.75c	5.50c	4.85c
Motor	5.425c	6.175c	5.525c
Dynamo	6.125c	6.875c	6.225c
Transformer			
72	6.625c	7.375c	.....
65	7.625c	8.375c	.....
58	8.125c	8.875c	.....
52	8.925c	9.675c	.....

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Cleveland, Pirmingham, Youngstown, Middletown base, 6-inch and narrower, 2.45c; Detroit, del., 2.55c; eastern Mich., 2.60c; Pacific ports, 3.10c; over 6-inch, base, 2.35c; Detroit, del., 2.45c; eastern Mich., 2.50c; Pacific ports, 3.00c.

Cold Rolled Strip: Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less, 3.05c; Chicago, base, 3.15c; Detroit, del., 3.15c; eastern Mich., 3.20c; Worcester, base, 3.25c.

Cold Finished Spring Steel: Pittsburgh, Cleveland, bases, add 20c for Worcester; .26-.50 Carb., 3.05c.

Tin, Terne Plate

Tin Plate: Pittsburgh, Chicago, Gary, 100-lb. base box, $5.25; Granite City, Birmingham, Sparrows Point, $5.35.

Electrolytic Tin Plate: Pittsburgh, Gary, 100-lb. base box, 0.25 lb. tin, $4.60; 0.50 lb. tin, $4.75; 0.75 lb. tin, $4.90; Granite City, Birmingham, Sparrows Point, $4.70, $4.85, $5.00, respectively.

Tin Mill Black Plate: Pittsburgh, Chicago, Gary, base 29-gage and lighter, 3.30c; Granite City, Birmingham, Sparrows Point, 3.40c; Pacific ports, boxed, 4.30c.

Long Ternes: Pittsburgh, Chicago, Gary, No. 24 unassorted, 4.05c; Pacific ports, 4.80c.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, 100-base box, $4.55; Granite City, Birmingham, Sparrows Point: $4.65.

Roofing Ternes: Pittsburgh base per package 112 sheets; 20 x 28 in., coating I. C. 8-lb. $12.50; 20-lb. $15.50 (Nom.); 40-lb. $20.00 (Nom.).

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, Coatesville, Claymont, 2.50c; New York, del., 2.69c; Phila., del., 2.55c; St. Louis, 2.74c; Boston, del., 2.82-3.07c; Pacific ports, 3.05c; Gulf ports, 2.85c.

(Granite City Steel Co. may quote carbon plates 2.65c f.o.b. D.P.C. mill; Geneva Steel Co., Provo, Utah, 3.20c f.o.b. Pac. ports.)

Floor Plates: Pittsburgh, Chicago, 3.75c; Pacific ports, 4.40c; Gulf ports, 4.10c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, Coatesville, 3.75c; Gulf ports, 4.20c; Pacific ports, 4.40c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.35c; New York, del., 2.52c; Phila., del., 2.465c; Pacific ports, 3.00c; Gulf ports, 2.70c.

(Phoenix Iron Co., Phoenixville, Pa., may quote the equivalent of 2.45c, Bethlehem, Pa., on the general range and 2.55c on beams and channels from 4 to 10 inches.)

Steel Piling: Pittsburgh, Chicago, Buffalo, 2.65c; Pacific ports, 3.20c.

Wire Products, Nails

Wire: Pittsburgh, Chicago, Cleveland, Birmingham to manufacturers in carloads.

Bright, basic, bessemer wire ..... °$3.05

Spring wire ..... °‡$3.65

Wire Products to the Trade:

Standard and cement-coated wire nails, and staples, 100-lb. keg, Pittsburgh, Chicago, Birmingham, Cleveland, $3.25; Worcester, $3.55; Pac. ports, $3.75; galvanized, $2.90 and $3.40, resp.

Annealed Merchant quality wire, 100-lb., Pittsburgh, Chicago, Cleveland Birmingham ..... ‡‡$3.50

Galvanized Merchant quality wire, 100-lb., Pittsburgh, Chicago, Cleveland, Birmingham ..... ‡‡$3.85

Woven fence, 15½ gage and heavier, per base column 72

Barbed wire, 80-rod spool, Pittsburgh, Chicago, Cleveland, Birmingham, column 79; twisted barbless wire, column 79.

° Add $0.10 for Worcester, $0.05 for Duluth; add $0.50 for bright, annealed, galvanized and $0.70 for other finishes for Pacific ports.

‡ Same bases as for bright basic except Birmingham.

PRICES REVISED

In conformity with specific steel product price increases effected by the Office of Price Administration, announced March 1, price listing on these pages have been adjusted upward to reflect the changes, except in those instances where further clarification by OPA or the trade is necessary for correct interpretation of the OPA order.

In a number of products specific prices are yet to be announced. Also, in the case of rails, prices now are quoted on the basis of net tons.

‡‡ Add 10 cents for Worcester; 50 cents for annealed, bright basic and 70 cents for all other finishes 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			Iron	
In.	Blk.	Galv.	In.	Blk.	Galv.
⅛	53	30	½	21	0½
¼ & ⅜	56	37½	¾	27	7
½	60½	48	1-1¼	31	13
¾	63½	52	1½	35	15½
1-3	65½	54½	2	34½	15

Lap Weld

	Steel			Iron	
In.	Blk.	Galv.	In.	Blk.	Galv.
2	58	46½	1¼	20	0½
2½-3	61	49½	1½	25½	7
3½-6	63	51½	2	27½	9
7-8	62	49½	2½-3½	28½	11½
9-10	61½	49	4	30½	15
11-12	60½	48	4½-8	29½	14
			9-12	25½	9

Boiler Tubes: Net base prices per 100 feet f.o.b. Pittsburgh in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

		—Seamless—		—Elec. Weld—	
O.D. sizes	B.W.G.	Hot Rolled	Cold Drawn	Hot Rolled	Cold Rolled
1"	13	.....	$9.90	$9.36	$9.65
1¼"	13	.....	11.73	9.63	11.43
1½"	13	$10.91	12.96	10.63	12.64
1¾"	13	12.41	14.75	12.10	14.37
2"	13	13.90	16.52	13.53	16.19
2¼"	13	15.50	18.42	15.06	18.03
2¼"	12	17.07	20.28	16.57	19.83
2½"	12	18.70	22.21	18.11	21.68
2¾"	12	19.82	23.54	19.17	22.95
3"	12	20.79	24.71	20.05	24.02
3½"	11	26.24	31.18	25.30	30.29
4"	10	32.56	38.68	31.32	37.52
4½"	9	43.16	51.29	.....	.....
5"	9	49.96	59.36	.....	.....
6"	7	76.71	91.14	.....	.....

Rails, Supplies

Standard rails, over 60-lb., f.o.b. mill, net ton, $43.40. Light rails (billet), Pittsburgh, Chicago, Birmingham, net ton, $49.18.

°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 $51 net ton, base, Standard spikes, 3.65c.

° 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 15.15c; extra carbon 19.48c; special carbon 23.80c; oil-hardening 24.00c; high car.-chr. 46.52c.

Tung.	Chr.	Van.	Moly.	Base, per lb.
18.00	4	1	..	67.05c
1.5	4	1	8.5	54.04c
....	4	2	3	54.04c
6.40	4.15	1.90	5	62.20c
5.50	4.50	4	4.50	75.74c

Rivets, Washers

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham.

Structural 3.75c

½-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., ⅞ 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; 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.
⅞-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

Stainless Steels

Base, Cents per lb.

	Bars	Plates	Sheets	H. R. Strip	C. R. Strip
CHROMIUM NICKEL STEELS					
302	25.96c	29.21c	36.79c	23.93c	30.30c
303	28.13	31.38	38.95	29.21	35.71
304	27.05	31.38	38.95	25.45	32.46
308	31.38	36.79	44.36	30.84	37.87
309	38.95	43.28	50.85	40.03	50.85
310	53.02	56.26	57.35	52.74	60.59
312	38.95	43.28	53.02	.....	.....
°316	43.28	47.61	51.94	43.28	51.94
†321	31.38	36.79	44.36	31.65	41.12
†347	35.71	41.12	48.69	35.71	45.44
431	20.56	23.80	31.38	18.94	24.35
STRAIGHT CHROMIUM STEEL					
403	23.93	26.51	31.92	22.99	29.21
°°410	20.02	23.93	28.67	18.39	23.80
416	20.56	23.80	29.21	19.75	25.45
††420	25.96	30.84	36.25	25.70	39.49
430	20.56	23.80	31.38	18.94	24.35
‡‡430F	21.10	24.35	31.92	20.29	26.51
440A	25.96	30.84	36.25	25.70	39.49
442	24.35	27.59	35.17	25.96	34.62
443	24.35	27.59	35.17	25.96	34.62
446	29.76	33.00	39.49	37.87	56.26
501	8.66	12.98	17.04	12.98	18.39
502	9.74	14.07	18.12	14.07	19.48
STAINLESS CLAD STEEL (20%)					
304	.....	§§19.48	20.56	.....	.....

°With 2-3% moly. §With titanium. ‡With columbium. °°Plus machining agent. ††High carbon. ‡‡Free machining. §§Includes annealing and pickling.

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	13.25
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	27.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c
Per lb. f.o.b. works	
Phenol (car lots, returnable drums)	10.50c
Do., less than car lots	11.25c
Do., tank cars	9.50c
Eastern Plants, per lb.	
Naphthalene flakes, balls, bbls., to jobbers	8.00c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia	$29.20

WAREHOUSE STEEL PRICES

Base delivered price, cents per pound, for delivery within switching limits, subject to established extras. Quotations based on OPA mill prices announced March 1, 1946.

	Hot rolled bars	Structural shapes	Plates	Floor plates	Hot rolled sheets (10 gage base)	Hot-rolled strip (14-gage and lighter, 6-in and narrower)	Hot-rolled strip 12-gage and heavier wider than 6-inch	Galvanized flat sheets (24 gage base)	Cold-rolled sheets (17 gage base))	Cold finished bars	Cold-rolled strip
Boston	4.294[1]	4.162[1]	4.162[1]	5.977[1]	3.999[1]	5.456[1]	4.356[1]	5.674[14]	4.969[14]	4.594[21]	4.965
New York	4.103[1]	4.008[1]	3.018[1]	5.824[1]	3.815[1]	4.324[1]	4.224[1]	5.460[13]	4.838[14]	4.553[21]	5.024
Jersey City	4.103[1]	3.997[1]	3.018[1]	5.824[1]	3.815[1]	4.324[1]	4.224[1]	5.460[13]	4.838[14]	4.553[21]	5.024
Philadelphia	4.072[1]	3.916[1]	3.855[1]	3.768[1]	3.743[1]	4.622[1]	4.172[1]	5.468[16]	5.097[25]	4.022[21]	5.022
Baltimore	4.052[1]	4.009[1]	3.844[1]	5.502[1]	3.619[1]	4.602[1]	4.152[1]	5.344[1]	5.077[25]	4.502[21]	.....
Washington	4.191[1]	4.180[1]	4.046[1]	5.591[1]	3.821[1]	4.741[1]	4.291[1]	5.646[17]	5.066[20]	4.491[21]	.....
Norfolk, Va.	4.315[1]	4.252[1]	4.221[1]	5.715[1]	3.996[1]	4.565[1]	4.415[1]	5.821[17]	4.490[24]	4.615[21]	.....
Bethlehem, Pa.*	.....	3.70[1]	.....	.....	.....	.....	.....	.....	.....	.....	.....
Claymont, Del.*	.....	.....	3.70[1]	.....	.....	.....	.....	.....	.....	.....	.....
Coatesville, Pa.*	.....	.....	3.70[1]	.....	.....	.....	.....	.....	.....	.....	.....
Buffalo (city)	3.60[1]	3.65[1]	3.88[1]	5.51[1]	3.575[1]	4.169[1]	4.069[1]	5.20[16]	4.625[10]	4.20[21]	4.919
Buffalo (country)	3.50[1]	3.55[1]	3.55[1]	5.15[1]	3.475[1]	3.85[1]	4.060[1]	5.10[16]	4.525[10]	4.10[21]	4.60
Pittsburgh (city)	3.60[1]	3.65[1]	3.65[1]	5.25[1]	3.575[1]	3.95[1]	3.850[1]	5.20[13]	4.625[24]	4.20[21]	4.70
Pittsburgh (country)	3.50[1]	3.55[1]	3.55[1]	5.15[1]	3.475[1]	3.85[1]	3.750[1]	5.10[13]	4.525[24]	4.10[21]	4.60
Cleveland (city)	3.60[1]	3.838[1]	3.65[1]	5.438[1]	3.575[1]	3.95[1]	3.850[1]	5.327[13]	4.625[24]	4.20[21]	4.70
Cleveland (country)	3.50[1]	.....	3.55[1]	.....	3.475[1]	3.85[1]	3.750[1]	.....	4.525[24]	4.10[21]	4.60
Detroit	3.70[1]	3.911[1]	3.859[1]	5.531[1]	3.675[1]	4.050[1]	3.950[1]	5.450[13]	4.725[24]	4.25[12]	4.909
Omaha (city, del.)	4.293[1]	4.343[1]	4.343[1]	5.943[1]	4.018[1]	4.493[1]	4.393[1]	6.065[13]	5.668[24]	4.893[21]	.....
Omaha (country)	4.193[1]	4.243[1]	4.243[1]	5.843[1]	3.918[1]	4.393[1]	4.293[1]	5.965[13]	.....	.....	.....
Cincinnati	3.861[1]	3.941[1]	3.911[1]	5.541[1]	3.650[1]	4.025[1]	3.925[1]	5.275[13]	4.700[24]	4.461[21]	4.961
Youngstown*	.....	.....	.....	.....	.....	.....	.....	4.85[13]	.....	.....	.....
Middletown, O.*	.....	.....	.....	.....	3.475[1]	3.85[1]	3.750[1]	5.10[16]	.....	.....	.....
Chicago (city)	3.75[1]	3.80[1]	3.80[1]	5.40[1]	3.475[1]	3.95[1]	3.850[1]	5.681[16]	4.425[24]	4.20[21]	4.90
Milwaukee	3.887[1]	3.937[1]	3.937[1]	5.537[1]	3.612[1]	4.087[1]	3.987[1]	5.722[16]	4.562[24]	4.337[21]	5.037
Indianapolis	3.83[1]	3.88[1]	3.88[1]	5.48[1]	3.743[1]	4.118[1]	4.018[1]	5.368[16]	4.793[24]	4.43[21]	5.030
St. Paul	4.01[2]	4.06[2]	4.06[2]	5.68[2]	3.735[2]	4.21[2]	4.110[2]	5.707[16]	4.685[24]	4.811[21]	5.352
St. Louis	3.924[1]	3.947[1]	3.947[1]	5.547[1]	3.622[1]	4.097[11]	3.997[1]	5.622[16]	4.572[24]	4.481[21]	5.181
Memphis, Tenn.	4.265[1]	4.315[1]	4.315[1]	6.03[1]	4.190[1]	4.565[1]	4.465[8]	5.715[16]	5.005[24]	4.78[21]	.....
Birmingham	3.65[1]	3.80[1]	3.80[1]	6.153[1]	3.675[1]	4.05[1]	3.950[2]	5.20[16]	5.077[24]	4.99[21]	5.465
New Orleans (city)	4.35[4]	4.15[4]	4.15[4]	6.10[4]	4.283[4]	4.55[4]	4.450[4]	5.70[30]	5.304[10]	5.05[21]	5.679
Houston, Tex.	4.00[3]	4.50[1]	4.50[1]	5.75[9]	3.988[3]	4.663[3]	4.563[9]	5.763[30]	5.819[10]	4.10[22]	.....
Los Angeles	4.65[4]	4.90[4]	5.20[4]	7.45[4]	5.225[4]	7.10[4]	5.200[4]	6.45[13]	7.425[9]	6.033[22]	5.863
San Francisco	4.40[7]	4.60[7]	4.90[7]	6.60[7]	4.775[7]	6.10[7]	4.750[7]	6.80[13]	7.525[15]	5.783[21]	7.583
Portland, Oreg.	4.70[27]	4.70[27]	5.00[27]	6.75[27]	4.875[27]	6.65[27]	5.000[27]	6.20[13]	6.825[15]	5.983[15]	.....
Tacoma, Wash.	4.60[6]	4.70[6]	5.00[6]	6.75[6]	4.875[6]	5.80[6]	4.500[6]	6.40[15]	7.825[15]	6.233[21]	.....
Seattle	4.70[6]	4.70[6]	5.00[6]	6.75[6]	4.875[6]	5.80[6]	4.500[6]	6.40[15]	7.275[15]	6.233[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 outside 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 bundles; [18]—one to six bundles; [19]—100 to 749 pounds; [20]—300 to 1999 pounds; [21]—1500 to 39,999 pounds; [22]—1500 to 1999 pounds; [23]—1000 to 39,999 pounds; [24]—400 to 1499 pounds; [25]—1000 to 1999 pounds; [26]—under 25 bundles. Cold-rolled strip, 2000 to 39,999 pounds, base; [27]—300 to 4999 pounds.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (Natural) Lower Lake Ports

Old range bessemer	$4.95
Mesabi nonbessemer	4.55
High phosphorus	4.55
Mesabi bessemer	4.70
Old range nonbessemer	4.80

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 58-63% 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.
Swedish basic, 60 to 68%	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 net.)

Indian and African

48% 2.8:1	$39.75
48% 3:1	41.00
48% no ratio	31.00

South African (Transvaal)

44% no ratio	$27.40
45% no ratio	28.80
48% no ratio	31.00
50% no ratio	32.50

Brazilian—nominal

44% 2.5:1 lump	33.65
48% 3:1 lump	48.50

Rhodesian

45% no ratio	28.30
48% no ratio	31.00
48% 3:1 lump	41.00

Domestic (seller's nearest rail)

48% 3:1	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, Colo., 91.0c; prices include duty on imported ore and are subject to premiums, penalties and other provisions of amended M.P.R. No. 248, effective as of May 15. Price at basing points which are also points of discharge of imported manganese ore is f.o.b. cars, shipside, at dock most favorable to the buyer. Outside shipments direct to consumers at 10c per unit less than Metal Reserve Co. prices.

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

NATIONAL EMERGENCY STEELS (Hot Rolled)

(Extras for alloy content)

Designation	Chemical Composition Limits, Per Cent — Carbon	Mn.	Si.	Cr.	Ni.	Mo.	Basic open-hearth Electric furnace: Bars per 100 lb.	Billets per GT	Bars per 100 lb.	Billets per GT
NE 9415	.13-.18	.80-1.10	.20-.35	.30-.50	.30-.60	.08-.15	$0.75	$15.00	$1.25	$25.00
NE 9425	.23-.28	.80-1.20	.20-.35	.30-.50	.30-.60	.08-.15	.75	15.00	1.25	25.00
NE 9442	.40-.45	1.00-1.30	.20-.35	.30-.50	.30-.60	.08-.15	.80	16.00	1.30	26.00
NE 9722	.20-.25	.50-.80	.20-.35	.10-.25	.40-.70	.15-.25	.65	13.00	1.15	23.00
NE 9912	.10-.15	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.20	24.00	1.55	31.00
NE 9920	.18-.23	.50-.70	.20-.35	.40-.60	1.00-1.30	.20-.30	1.20	24.00	1.55	31.00

Extras are in addition to a base price of 2.70c, per pound on finished products and $54 per gross ton on semifinished steel major basing points and are in cents per pound and dollars per gross ton. No prices quoted on vanadium alloy.

Pig Iron

Prices (in gross tons) are maximum fixed by OPA Price Schedule No. 10, 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
Bethlehem, Pa., base	$26.75	$26.25	$27.75	$27.25
Newark, N. J., del.	28.28	27.78	29.28	28.78
Brooklyn, N. Y., del.	29.25	.....	.....	29.75
Birdsboro, 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	.....	.....
Newark, N. J.	27.90	.....	.....	.....
Philadelphia, del.	27.21	26.71	.....	.....
St. Louis, del.	25.87	24.99	.....	.....
Buffalo, base	25.75	24.75	26.75	26.25
Boston, del.	27.25	26.75	28.25	27.75
Rochester, del.	27.28	.....	28.28	27.78
Syracuse, del.	27.83	.....	28.83	28.33
Chicago, 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
Cleveland, base	25.75	25.25	26.25	25.75
Akron, Canton, del.	27.14	26.64	27.64	27.14
Detroit, base	25.75	25.25	26.25	25.75
Saginaw, Mich., del.	28.06	27.56	28.56	28.06
Duluth, base	26.25	25.75	26.75	26.25
St. Paul, del.	28.38	27.88	28.88	28.38
Erie, 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
Granite City, Ill., base	25.75	25.25	26.25	25.75
St. Louis, del.	26.25	25.75	.....	26.25
Hamilton, O., base	25.75	25.25	.....	25.75
Cincinnati, del.	26.19	26.36	.....	26.86
Neville 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	.....	.....	.....
Steelton, Pa., base	.....	26.25	.....	.....
Swedeland, Pa., base	26.75	26.25	27.75	27.25
Philadelphia, del.	27.59	27.09	.....	28.09
Toledo, 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

Base 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 foundry iron. §For McKees 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

Note: Add 50 cents per ton for each 0.50% manganese or portion thereof over 1.00%.

Nickel 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 Jackson Co.; each additional .50% silicon up to and including 18% add $1; low impurities not exceeding 0.005 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 grade 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	40.30
New Jersey	52.00
Ohio	38.15

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

Ferromanganese (standard) 78-82% c.l. gross ton, duty paid, $135 f.o.b. cars, Baltimore, Philadelphia or New York, whichever is most favorable to buyer; Rockdale or Rockwood, Tenn.; where Tennessee Products Co. is producer; Birmingham, Ala., where Sloss-Sheffield Steel & Iron Co. is producer; $140 f.o.b. cars, Pittsburgh, where Carnegie-Illinois Steel Corp. is producer; add $6 for packed c.l., $10 for ton, $13.50 for less ton; $1.70 for each 1%, or fraction contained manganese over 82% or under 78%.

Ferromanganese (Low and Medium Carbon); per lb. contained manganese; eastern zone, low carbon, bulk, c.l., 23c; 2000 lb. to c.l., 23.40c; medium, 14.50c and 15.20c; central, low carbon, bulk, c.l., 23.30c; 2000 lb. to c.l., 24.40c; medium 14.80c and 16.20c; western, low carbon, bulk, c.l., 24.50c, 2000 lb. to c.l., 25.40c; medium, 15.75c and 17.20c; f.o.b. shipping point, freight allowed.

Spiegeleisen: 19-21% carlots per gross ton, Palmerton, Pa., $36; Pittsburgh, $40.50; Chicago, $40.60.

Electrolytic Manganese: 99.9% plus, less ton lots, per lb. 37.6 cents.

Chromium Metal: 97% min. chromium, max. .50% carbon, eastern zone, per lb. contained chromium bulk, c.l., 79.50c, 2000 lb. to c.l. 80c; central 81c and 82.50c; western 82.25c and 84.75c; f.o.b. shipping point, freight allowed.

Ferrocolumbium: 50-60%, per lb. contained columbium in gross ton lots, contract basis, R. R. freight allowed, eastern zone, $2.25; less-ton lots $2.30. Spot prices 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 $1.35, less, $1.60, pound of metal; $1.36 and $1.61 central, $1.40 and $1.65, western; spot up 5c.

Calcium-Manganese-Silicon: (Cal. 16-20% mang. 14-18% and sil. 53-59%), per lb. of alloy. Contract, carlots, 15.50c, ton lots 16.50c and less 17.00c, eastern, freight allowed; 16.00c, 17.35c, and 17.85c, central; 18.05c, 19.10c and 19.60c western; spot up .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. ½ 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.

Grainal: Vanadium Grainal No. 1 87.5c; No. 6, 60c; No. 79, 45c; all f.o.b. Bridgeville, Pa., usual freight allowance.

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: (98% 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, 10,000 lb. or more, per lb. contained tungsten, $1.90; contract, $1.88; 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 net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi River and North of Baltimore and St. Louis, 6.8% carbon $142.50; 3-5% carbon $157.50.

Carbortam: Boron 0.90 to 1.15% net ton to carload, 8c lb. f.o.b. Suspension Bridge, N. Y., frt. allowed same as high-carbon ferrotitanium.

Bortam: Boron 1.5-1.9%, ton lots 45c lb., less ton lots 50c lb.

Ferrovanadium: 35-55%, contract basis, per lb. contained vanadium, f.o.b. producers plant with usual freight allowances; open-hearth grade $2.70; special grade $2.80; highly-special grade $2.90.

Zirconium Alloys: 12-15%, per lb. of alloy, eastern contract, carlots, bulk, 4.60c, packed 4.80c, ton lots 4.80c, less tons 5c, carloads, bulk, per gross ton $102.50; packed $107.50; ton lots $108; less-ton lots $112.50. Spot ¼c per ton higher.

Zirconium Alloy: 35-40%, Eastern, contract basis, carloads in bulk or package, per lb. of alloy 14.00c; gross ton lots 15.00c; less-ton lots 16.00c. Spot ¼ cent higher.

Alsifer: (Approx. 20% aluminum, 40% silicon, 40% iron) contract basis f.o.b. Niagara Falls, N. Y., per lb. 5.75c; ton lots 6.50c. Spot ½ cent higher.

Siminal: (Approx. 20% each si., Mn., Al.) Contract, frt. all. not over St. Louis rate, per lb. alloy; carlots 8c; ton lots 8.75c; less ton lots 9.25c.

Boresil: 3 to 4% boron, 40 to 45% Si., $6.25 lb. cont. Bo., f.o.b. Philo, O., freight not exceeding St. Louis rate allowed.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Following prices are quotations developed by editors of STEEL in the various centers. For complete OPA ceiling price schedule refer to page 156 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	13.31
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	28.00
Rail 3 ft. and under	23.50
Railroad Malleable	22.00

VALLEY:

(Delivered consumer's plant)

No. 1 R.R. Heavy Melt.	$21.00
No. 1 Heavy Melt. Steel	20.00
No. 1 Comp. Bundles	20.00
Short Shovel Turnings	17.00
Cast Iron Borings	16.00
Machine Shop Turnings	15.00
Low Phos. Plate	22.50

MANSFIELD, 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. Heavy Melt.	$19.75
No. 1 Heavy Melt. Steel	18.75
No. 2 Heavy Melt. Steel	18.75
No. 1 Ind. Bundles	18.75
No. 2 Dlr. Bundles	18.75
Baled Mach. Shop Turn.	18.75
No. 3 Galv. Bundles	16.75
Machine Turnings	13.75
Mix. Borings, Sht. Turn.	13.75
Short Shovel Turnings	15.75
Cast Iron Borings	14.75
Scrap Rails	20.25
Cut Rails, 3 feet	22.25
Cut Rails, 18-inch	23.50
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:

(Delivered consumer's plant)

Heavy Melting Steel	$17.32
No. 1 Busheling	17.32
Hydraulic Bundles	17.32
Flashings	17.32
Machine Turnings	12.32
Short Shovel, Turnings	14.32
Cast Iron Borings	13.32
Low Phos. Plate	19.82
No. 1 Cast	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	10.50
Shoveling Turnings	12.50
Rerolling Rails	21.00
Steel Car Axles	21.50-22.00
Steel Rails, 3 ft.	21.50
Steel Angle Bars	21.00
Cast Iron Wheels	20.00
No. 1 Machinery Cast	20.00
Railroad Malleable	22.00
Breakable Cast	16.50
Stove Plate	19.00
Grate Bars	15.25
Brake Shoes	15.25

(Cast grades f.o.b. shipping point)

Stove Plate	18.00

CINCINNATI:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$18.50
No. 2 Heavy Melt. Steel	18.50
No. 1 Comp. Bundles	18.50
No. 2 Comp. Bundles	18.50
Machine Turnings	9.50-10.00
Shoveling Turnings	11.50-12.00
Cast Iron Borings	11.00-11.50
Mixed Borings, Turnings	10.50-11.00
No. 1 Cupola Cast	20.00
Breakable Cast	16.50
Low Phosphorus	21.00-21.50
Scrap Rails	20.50-21.00
Stove Plate	16.00-16.50

LOS ANGELES:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$14.00
No. 2 Heavy Melt. Steel	13.00
No. 1, 2 Deal. Bundles	12.00
Machine Turnings	4.50
Mixed Borings, Turnings	4.00
No. 1 Cast	20.00

SAN FRANCISCO:

(Delivered consumer's plant)

No. 1 Heavy Melt. Steel	$15.50
No. 2 Heavy Melt. Steel	14.50
No. 1 Busheling	15.50
No. 1, No. 2 Bundles	13.50
No. 3 Bundles	9.00
Machine Turnings	7.00
Billet, Forge Crops	15.50
Bar Crops, Plate	15.50
Cast Steel	15.50
Cut, Structural, Plate, 1", under	18.00
Alloy-free Turnings	7.00
Tin Can Bundles	14.50
No. 2 Steel Wheels	15.50
Iron, Steel Axles	23.00
No. 2 Cast Steel	15.50
Uncut Frogs, Switches	15.50
Scrap Rails	15.50
Locomotive Tires	15.50

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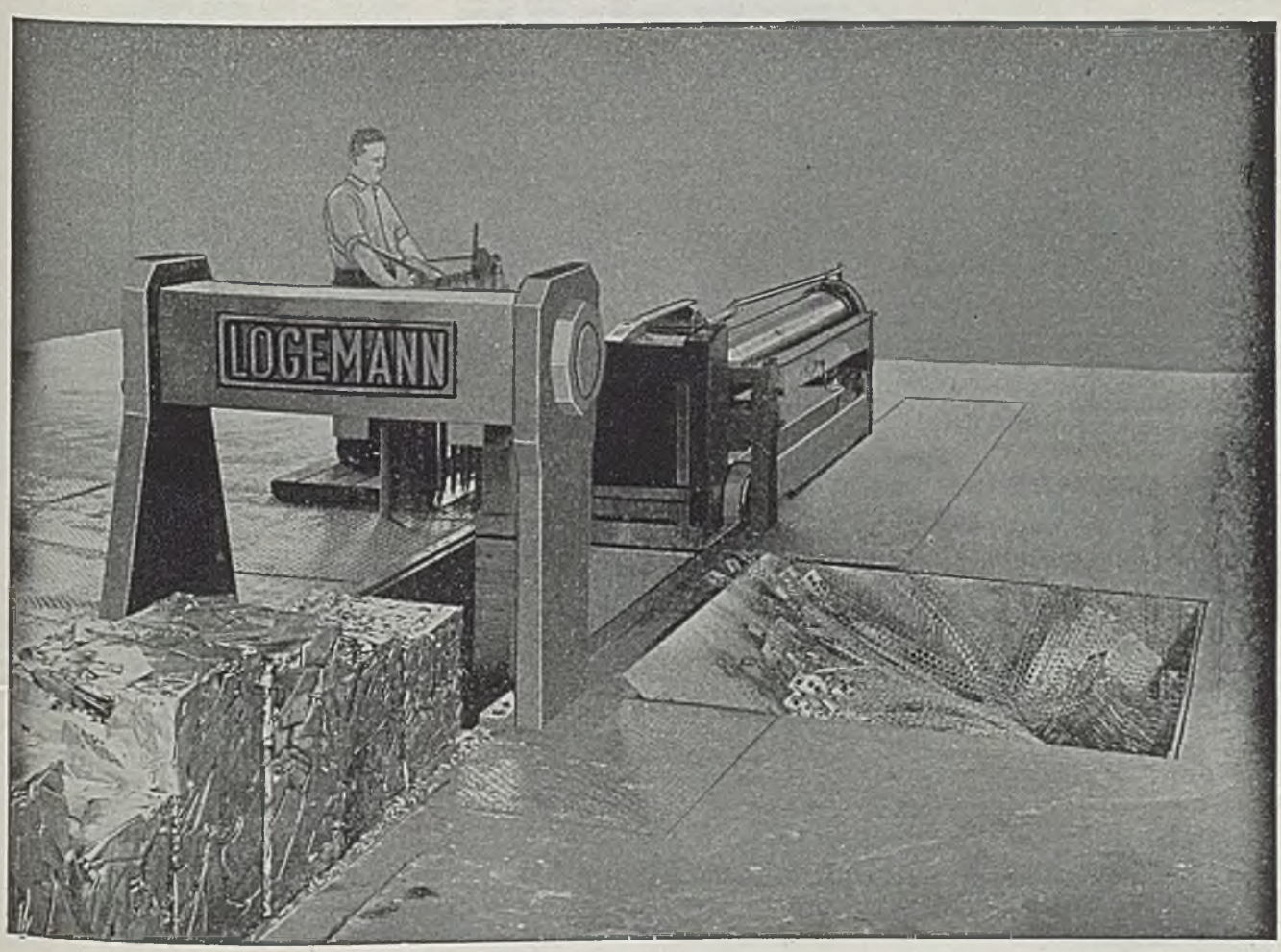

NONFERROUS METAL PRICES

Copper: Electrolytic or Lake from producers in carlots 12.00c, Del. Conn., less carlots 12.12½c, refinery; dealers may add ¾c for 5000 lbs. to carload; 1000-4999 lbs. 1c; 500-999 1¼c; 0-499 2c. Casting, 11.75c, refinery for 20,000 lbs., or more. 12.00c less than 20,000 lbs.

Brass Ingot: Carlot prices, including 25 cents per hundred freight allownace; add ¼c for less than 20 tons; 85-5-5-5 (No. 115) 13.00c; 88-10-2 (No. 215) 16.50c; 80-10-10 (No. 305) 15.75c; Navy G (No. 225) 16.75c; Navy M (No. 245) 14.75c; No. 1 yellow (No. 405) 10.00c; manganese bronze (No. 420) 12.75c.

Zinc: Prime western 8.25c, select 8.35c, brass special 8.50c, intermediate 8.75c, E. St. Louis, for larlots. For 20,000 lbs. to carlots add 0.15c; 10,000-20,000 0.25c; 2000-10,000 0.40c; under 2000 0.50c.

Lead: Common 6.35c, chemical, 6.45c, corroding, 6.45, E. St. Louis for carloads; add 5 points for Chicago, Minneapolis-St. Paul, Milwaukee-Kenosha districts; add 15 points for Cleveland-Akron-Detroit area, New Jersey, New York state, Texas, Pacific Coast, Richmond, Indianapolis-Kokomo; add 20 points for Birmingham, Connecticut, Boston-Worcester, Springfield, New Hampshire, Rhode Island.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lbs. and over; add ½c 2000-9999 lbs.; 1c less through 2000 lbs.

Secondary Aluminum: All grades 12.50c per lb. except as follows: Low grade piston alloy (No. 122 type) 10.50c; No. 12 foundry alloy (No. 2 grade) 10.50c; chemical warfare service ingot (92½% plus) 10.00c; steel deoxidizers in notch bars, granulated or shot, Grade 1 (95-97½%) 11.00c, Grade 2 (92-95%) 9.50c to 9.75c, Grade 3 (90-92%) 8.00c to 8.25c, Grade 4 (85-90%) 7.75c; any other ingot containing over 1% iron, except PM 754 and hardeners, 12.00c. Above prices for 30,000 lb. or more; add ¼c 10,000-30,000 lb.; ½c 1000-10,000 lbs.; 1c less than 1000 lbs. Prices include freight at carload rate up to 75 cents per hundred.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, 17 lbs.) 20.50c lb., add 1c for special shapes and sizes. Allyo ingots, incendiary bomb alloy, 23.40c; 50-50 magnesium-aluminum, 23.75c; ASTM B93-41T, Nos. 2, 3, 4, 12, 13, 14, 17, 23.00c; Nos. 4X, 11, 13X, 17X, 25.00c; ASTM B-107-41T, or B-90-41T, No. 8X, 23.00c; No. 18, 23.50c; No. 18X, 25.00c. Selected magnesium crystals, crowns, and muffs, including all packing screening, barrelling, handling, and other preparation charges, 23.50c. Price for 100 lbs. or more; for 25-100 lbs., add 10c; for less than 25 lbs., 20c. Incendiary bomb alloy, f.o.b. plant, any quantity; carload freight allowed all other alloys for 500 lbs. or more.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lbs., 1½c 1000-2239. 2°c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straits), 52.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05 per cent maximum arsenic, 51.87½c; Grade C, 99.65-99.79% incl. 51.62½c; Grade D, 99.50-99.64% incl., 51.50c; Grade E, 99-99.49% incl. 51.12½c; Grade F, below 99% (for tin content), 51.00c.

Antimony: American bulk carlots f.o.b. Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 14.50c; 99.8% and over (arsenic, 0.05%, max. and other impurities, 0.1%, max.) 15.00c. On producers' sales add ¼c for less than carload to 10,000 lb.; ½c for 9999-224 lb.; and 2c for 223 lb. and less; on sales by dealers, distributors and jobbers add ½c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.5%, f.o.b. refinery 35.00c lb.; pig and shot produced from electrolytic cathodes 36.00c; "F" nickel shot or ingot for additions to cast iron, 34.00c; Monel shot 28.00c.

Mercury: Open market, spot, New York, $103-$106 per 76-lb. flask.

Arsenic: Prime, white, 99%, carlots, 4.00c lb.

Beryllium-Copper: 3.75-4.25% Be., $17 lb. contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" 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% 29.75c, 95% 29.78c; red brass 80% 28.65c, 85% 28.86c.

Copper Wire: Soft, f.o.b. Eastern mills, carlots 15.37½c, less-carlots 15.87°c; 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 bbls. 34.00c f.o.b. Niagara Falls.

Sodium Cianide: 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 35.50c.

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 ¾c 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
Manz. 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 172

Few sheet orders are being accepted by mills as output for the year is covered in most cases and little tonnage is being taken for 1947. Mills operating on a quota system have sufficient unscheduled orders to cover all production for the year. The latter have not made up third quarter schedules and have only recently decided on quotas for second quarter. Curtailment of allotments by mills under quota have forced many consumers to shop about, but with little success.

New York — Sheet orders continue limited mainly by inability of mills to promise deliveries requested; and even this would not interfere in a number of instances if producers were willing to accept tonnage for shipment well into the future and at their own convenience. Many consumers would place tonnage for 1947 shipment if mills would book that far ahead.

At present most mills refuse to book beyond the end of this year, which means that some are virtually out of the market, particularly on such items as galvanized, polished stainless and electrical sheets.

Producers operating on a quarterly quota basis have not officially opened books for third quarter and, in fact, have only just recently set up quotas for the second period, with considerably reduced quotas, as compared with the last full quarter before the steel strike, the last three months of last year. However, to all practical purposes, mills operating on a quarterly quota basis are booked ahead indefinitely, being under obligation to meet the commitments of their regular customers as far as reasonably possible. Actually they already are so far behind in fulfilling commitments definitely booked that it will take them a number of weeks to catch up, on the basis of present outlook.

Curtailment of second quarter quotas by mills has forced many buyers to shop around in a generally unsuccessful effort to get tonnage they need.

Boston — Attempts to place orders for flat-rolled products find mills sold through the remainder of the year, frequently on a quota basis, although this forward tonnage is not definitely scheduled. This situation covers all grades of sheets, with exception of heaviest gages rolled on some plate mills. Even in this category No. 12 hot-rolled for 275-gallon household tanks is tight, with several shops curtailed. While serious curtailment of consumer operations is limited to relatively few shops, some prospective programs for new products and expansions in others are, however, retarded. Sheets and strip cannot be promised for many of these potential expansions.

Inquiry for September delivery is notably heavy. Spot and scattered openings are likely for some of this volume but now definite delivery cannot be assured, with pressure for shipment of delayed old orders unabated. At some points in production nearly every industry is affected by current or prospective shortages in steel. Some suppliers to the shoe industry are short of shank steel and tack plate and are shopping for fill-in tonnages. There are similar spots in textile mill equipment and other industries. Although strikes in electrical equipment shops have caused some easing, it is not enough, however, to offset heavier demand from other consumers. Substantial tonnages of electrical sheets are still offered, with limited prospect of fourth quarter delivery.

St. Louis — Sheet production here is approaching normal for the first time since the steel strike, aided by improved labor supply. Demand is heavy and all sheets are under allocation to district offices for distribution to customers. Schedules are filled for the year and 1947 books will not be opened for some time. There has been about 30 per cent deficiency in planned production since V-J Day, widened by the steel strike and labor inefficiency. Inquiries increased substantially last week, especially from outside points. Pressing hardest are oil, railroad, electrical, jobbing and farm implement industries.

Pittsburgh — Despite the fact leading consumers' plants remain closed by strikes, sellers report heavy influx of new orders. Only tentative delivery dates, at best, can be made on this new tonnage and none of it is scheduled. Sellers are hopeful of reaching prestrike output early this week. Except for production affected by suspension orders received from metalworking companies still on strike, little revision in operating schedules is indicated over the remainder of this quarter. Sellers are

booked through the year on most items.

Production of galvanized, enameling and electrical sheets might be increased under the new price schedules representing advances from $7 to $12 a ton. In the past output of these items has been restrictetd, due to losses. In most instances sellers are booked through 1946 on these items. Along with higher wage costs, cold-rollers face a narrowing in their spread between purchased steel and selling prices, as a result of the $7 per ton increase in hot-rolled strip, against $5 per ton advance for cold-rolled strip.

No definite delivery promise is available on polished stainless steel sheets, with backlogs extended into next year in most instances. Carnegie-Illinois Steel Corp., Rustless Iron & Steel Corp., and other producers have not yet advanced stainless steel items (base price plus extras) by 8.2 per cent as recently announced by Allegheny Ludlum Steel Corp., Crucible Steel Co. of America and Joslyn Mfg. & Supply Co.

Contrary to previous OPA announcement that all alloy steel products except stainless are to be advanced by 4 per cent of the base price plus extras, it is now reported that an "across the board" increase of $5 will be granted. This would mean a higher advance for alloys and would disregard the extras for the time being.

Cleveland — Despite suspensions of operations at numerous metalworking plants, due to work stoppages in their own or their suppliers' plants, producers of sheet and strip have received few postponements. Rolling mill schedules are full for months ahead and only a few new orders are being booked. In some instances, where effects of the recent strike were particularly severe, delivery schedules call for a light percentage of January tonnage to be delivered in April, and a slightly increased percentage of subsequent monthly tonnages until July when mills will attain 100 per cent of expected deliveries. Meanwhile deliveries will fall steadily behind schedules as set up originally. Narrow strip producers report that many cold rollers are requesting a change in specifications on strip, shifting from widths 6 inches and under to over 6 inches in order to realize the present $2 a ton differential.

Philadelphia—Sheet consumers, many of whom had a reduction in quotas, are shopping about, with little success. Accordingly, early fabricating schedules are being revised and in various instances whole programs which had been projected months ahead. While all grades of sheets are tight, greatest scarcity appears in galvanized and electrical sheets. Relatively little tonnage is available for this year in any grade, however, and as most mills have not opened books for 1947 new sheet contracts are limited, despite potential requirements.

Chicago — Finishing operations on steel sheets and strip are now coming close to prestrike level. However, receipts are not adequate to support full fabricating operations; at least another month will be required to approach near normal. Sheet customers lose no time in specifying against allocations assigned to them and press for increased tonnages, which mills cannot accommodate. Now that the General Motors strike has ended, the company's plants will ask resumption of shipments which were stopped when inventory ceilings were reached. No easing in sheet supply can be seen until 1947.

Cincinnati—Steel and sheet production is being resumed by the Andrews Steel Co. (Newport Rolling Mills) after completion of new contracts with CIO workers. Elsewhere in the district production is being pushed while pressure for deliveries and for position on schedules is tremendous. Mills trying to allot the available tonnage to old customers on basis of 1940-41 requirements face an extra problem in supplying the numerous interests which had projected postwar expansion.

Birmingham—Production of sheets has increased with enlarged mill schedules but a balance between supply and demand is not yet in sight, even though some fabricators have remained out of the market evidently seeking a more accurate determination of their own price levels. Not much tonnage is available for some months on the basis of present commitments.

Steel Bars . . .

Bar Prices, Page 172

Bar mills are increasing production rapidly and shipments are better, but commitments are so heavy that it will be many weeks before deliveries are brought into control. Little tonnage is available in hot-rolled carbon bars before fourth quarter and in small diameters bookings cover output for the year. Cold-drawn bars are easier and orders

can be placed for third quarter delivery in some cases, though here, too, small sizes cover most of the year. Hot-rolled alloy bars can be had in second quarter, in some cases as early as April.

New York — Hot bar production is now getting back into full swing, but because of effects of the recent steel strike, producers generally will be some weeks catching up on back commitments. Most sellers at present have little new tonnage they can offer before fourth quarter and when it comes to small and medium sizes, they are practically booked up for the year. Certain producers, in fact, were even booked up solidly for the year on the small sizes before the steel strike and the only reason they are not now scheduled well into next year is because of their refusal to accept business that far ahead. The situation in cold-drawn bars is not so far extended. Some third quarter tonnage can still be had, although again in the very small sizes shipments cover virtually the remainder of the year.

Boston — Carbon bar deliveries on old orders have snapped back to better volume than in some products, with several mills, due in part to available stocks of semifinished, notably at Buffalo. Hot carbon stock in small sizes, under 2½-inch, is virtually sold through this year. Cold-drawn material, however, is less extended, with some New England production open for August delivery. As near as July is promised on some cold-drawn bar shapes and finishes, but schedules range up to December, depending on mill and size.

Hot-rolled alloys are still relatively easy, although in small sizes cold-drawn alloys have lengthened a month, spread from September to December. The former delivery includes ½-inch to 9/16ths, inclusive. Production of some named grades of alloy bars has been resumed and, starting with a clear order book, deliveries on these range from three to four weeks for hot-rolled standard grades to six or eight weeks for cold-finished. Nonstandard grades are five to six weeks on hot-rolled to eight or ten weeks on cold-finished nonstandard grades. Uncertainty as to application of new higher alloy prices has confused some transactions with both mills and distributors.

St. Louis — Pressure for merchant bars is unabated with all sizes sold out for six months or more. Few 1917 bookings are being accepted and those without delivery promise, but first quarter output is about 50 per cent sold. Bar mills were not shut down by the strike but production lagged from worker indifference. Manpower is adequate but lacks experience. The electrical equipment strike has delayed planned midsummer completion of a new rod mill of 10,000 tons monthly capacity. Completion is not expected before 1947.

Cleveland—To relieve pressure on bar mills, some producers are scheduling orders for the small sizes, ⅜-inch and ¼-inch rounds, for instance, on rod mills. The volume of business which can be shifted in this manner is limited, due in some cases to inability of rod mills to hold to required tolerances and to the fact that these mills are also overloaded. Hot-rolled bar producers have either scheduled fully through the balance of the year or have reserved space for that period to fill orders already on file. Some space is still open, however, on larger mills for fourth quarter delivery.

Independent cold-finished bar producers are falling further behind. Deliveries from hot mills are still below prestrike levels and are about two months behind schedule and cold finishers' reserve stocks of bars are dwindling rapidly. Bookings are being made for August delivery on large sizes and December on small sizes.

Alloy bar producers are still uncertain as to new prices and are awaiting clarification from OPA. Supply is comparatively easy with July delivery promised on most grades and sizes. NE steels 8620 and 8720 are in demand for gears, etc., while NE steels 8640 and 8740-50 are in demand for shafts and similar products.

Production can be maintained at required levels easily because a better grade of scrap is available, reflecting in part the improved system of segregation developed during the war.

Pittsburgh — Settlement of General Motors Corp. strike should soon be reflected in increased requirements for carbon and alloy steel bars. There is some doubt that alloy steel bar prices (base price plus extras) will be advanced 4 per cent in line with amendment 15 to RPS-6. It is reported that alloy steel prices will take a flat increase of $5, with no immediate action on extras. In most instances sellers are booked into fourth quarter on small carbon bar sizes, with large rounds available late in third quarter, and alloys in August and Sep-

tember. Cold-drawers offer late second quarter delivery, but these deliveries may have to be extended unless inventories are replenished more rapidly.

Philadelphia — Hot carbon bar producers are practically out of the market for this year on small and medium sizes and some appear in an equally bad position on larger sizes. Many consumers have long since stopped insisting on exact sizes, being willing to take anything within reason that can be machined down to their needs. Some have even gone into alloys for certain purposes, because of relatively easy deliveries. Some mills still can supply hot alloy bars for April, although May is usually quoted.

Chicago — Barmakers are now close to pre-strike level of production, but spreading tonnage among the maximum number of consumers nets the latter only meager quantities, in many cases too small to sustain operations. Some larger manufacturers, just feeling full effect of the steel strike, are closing down for periods ranging up to two months, until a working supply of steel is accumulated. Bumper steel is particularly critical. One automobile manufacturer is said to have shipped dealers 6000 cars without bumpers, another maker has had final assembly affected in almost similar degree.

Steel Plates . . .

Plate Prices, Page 173

Plate demand is heavy and growing, with lighter gages predominating, causing lack of balance on mill books. Little can be placed for delivery before fourth quarter and some mills are sold for the year. Operations at fabricating plants are irregular as a result of unbalanced inventories, many such shops having worked during the steel strike, exhausting some grades and sizes. There is much pressure for shipments from these shops.

Boston — Buying is active but is out of balance as to sizes, still centered strongly in lighter gages, with deliveries in fourth quarter. Tank fabricating schedules are made uncertain by delay in head deliveries in some instances, although receipts against old orders for both plates and heads are now mounting after slow resumption by some mills. Plate fabricators' inventories are out of balance as to grades and sizes and pressure for tonnage is maintained. A New England shop is placing substantial volume for boilers required for trawlers to be built by Bath Iron Works. There was competition for this contract from British boilermakers.

New York — Notwithstanding irregular operations at some fabricating plants, plate demand continues to expand. In fact, spotty operations at some plants has been due to unbalanced inventories, and it is from such plants that pressure for tonnage is especially strong. A number had been able to keep going through the steel strike, drawing upon stocks, but to date they have not been able to replenish them in any substantial degree and are after both distributors and mills for plates to build up stocks and get back to a more stable basis of operation.

There is also a good future demand. Most mills have little they can promise before fourth quarter and some regard themselves as virtually out of the market for the entire year, especially on light-gage sheets, which are still in outstanding demand for underground fuel oil storage tanks, for both domestic and commercial purposes. But there is still good future buying.

Cleveland—Inquiry for plates declined, although potential demand is still heavy. Most consumers have as much tonnage on producers' books as will be accepted at this time, since mills have been scheduled to capacity through the first half and in some instances into fourth quarter. Floor plate demand is active but well below the war peak, when large tonnages were used by manufacturers of jeeps and other military vehicles. Heavier demand for this product is expected to develop as soon as farm implement manufacturers attain their projected production levels.

Birmingham — Need for plates is increasing in this section, with expanded shipbuilding activities at Mobile and a continuation of large scale production at Pascagoula, Miss. Inventories in most instances are extremely low and effort is being made to correct that situation, with deliveries already into fourth quarter.

Philadelphia — Some plate tonnage is available for September but in general producers quote fourth quarter and two mills claim they have no capacity left for the entire year. Some producers report new business in excess of production. About 24,000 tons, mainly plates, will be required for four cargo ships on which Sun Shipbuilding & Dry Dock Co., Chester, Pa., is low bidder. Maritime Commission reports the ships will be operated by Ore Steamship Co., New York, a Bethlehem Steel Co. subsidiary.

Tubular Goods . . .

Tubular Goods Prices, Page 173

Boston — Importance of delivery to maintain fabrication schedules is reflected in specification revisions for tubular products, regardless of price differentials. Normally using so-called bedstead tubing for certain grades of furniture and children's vehicles, one large consumer is taking electric-welded tubing. Others including bicycle manufacturers, usually specifying electric welded, are buying seamless. Some of the latter also is going to textile equipment shops normally fabricating electric welded. In these cases cost of steel is materially higher and when delivery schedules approach normal most are expected to revert to former grades.

Demand for merchant steel pipe is active, with distributor stocks low and deliveries in fourth quarter. Delivery on steel pipe has been deferred two months by some mills because of tonnage lost by strikes. Others have reduced quotas. As some producers already were six weeks behind, extensions in deliveries by two months will not in all cases bring up to date on that basis.

Pittsburgh—There is some doubt that much increased tonnage of tube rounds and skelp will be made available to nonintegrated mills under the new price schedules, for integrated producers claim they are losing money under present price ceilings. However, the greater spread between tube rounds and skelp, and finished pipe and tubing prices are expected to help nonintegrfated pro-

ducers meet recent wage increase demands.

Wire . . .

Wire Prices, Page 173

Chicago—Repercussions of the month-long steel strike are now being felt by jobbers serving the farm trade. At this time of year, farmers are heavy buyers of steel items for spring and summer use, but currently little material is to be had. Recalling that last year bale tie supply fell short of requirements, they have sought to be forehanded this year, only to find conditions equally as bad.

Boston — Several additional wire mills have resumed production, including one high-carbon specialty mill in the Worcester district. Extensive rescheduling, revisions in quotas and pressure for rods overhang delivery schedules. Selectivity in acceptance of new orders and production under new prices continues, with pressure for overdue tonnage strong, although in many instances original bookings have been drastically revised, with available tonnage spread over as many fabricators as possible. Electrical equipment strikes have forced some new production setups but the most far-reaching indirect effect is shortage of fractional motors, holding up output in numerous instances. Larger consumers of wire and rods are pinched less for steel than the general run of users. Production of antifriction bearings, screws and small fasteners are not badly off.

Tin Plate . . .

Tin Plate Prices, Page 173

Pittsburgh — Tin plate producers continue to invoice can manufacturers at the prices in effect prior to recent 25 cents per base box advance. It is pointed out that sellers are under contract for all of 1946 shipments to these consumers at the old place. Similarly can manufacturers are committed on cost of containers to packers. However, producers are preparing new price lists on basis of recent advances granted by OPA. On all contract commitments covering 1947 shipments, the higher tin plate prices are expected to be applied. In addition to the price advances recently published, an increase of 50 cents on roofing ternes to $12.50 per package of 112 sheets, 20 x 28-inch, coating I. C. 8-lb., base Pittsburgh, has been announced.

Tin plate production schedules are expected to reach new prestrike pace early this week. Output likely will be under forced draft through remainder of this year, particularly in the immediate future to meet the heavy food pack program. Sellers are permitted to set aside only 15 per cent of their tin mill production for manufacture of containers for other than perishable and seasonable foods, drugs, and medicinals, under Amendment to Direction 9 of Order M-21. Still excluded from use of tin plate are containers for shortening, beer, dog food and coffee.

Rails, Cars . . .

Track Material Prices, Page 173

New York — Car buying so far this year has been spotty, with indications that the first quarter will be much lighter than in the preceding period, when

7086 cars were placed by domestic lines. During January domestic freight car awards amounted to 420 and during February, 1795, with few placed so far this month and with few under active figuring.

About the only certainties at present are that deliveries will continue far extended for some time and that costs will be increasingly higher. All builders of railroad equipment are inserting escalator clauses in their bids to meet rising costs and this is discouraging the carriers in a number of instances; also the fact that little equipment placed now could possibly be delivered before next year, not because of any shortage in car building capacity, but because of shortage of materials.

Comparative figures on domestic freight car awards follow:

	1946	1945	1944	1943
Jan.	420	7,200	1,020	8,365
Feb.	1,795	1,750	13,240	350
March	.....	2,500	6,510	1,935
April	.....	1,120	4,519	1,000
May	.....	1,526	1,952	870
June	.....	670	1,150	50
July	.....	3,500	795	4,190
Aug.	.....	7,240	3,900	8,747
Sept.	.....	12,840	400	6,820
Oct.	.....	1,320	2,425	5,258
Nov.	.....	1,650	1,065	870
Dec.	.....	4,116	16,245	2,919
Total	.....	45,432	53,221	41,355

Pittsburgh — In addition to price advance of $9 a net ton effective Feb. 25 on light rails, and $5 on all other types and grades, OPA announced last week that effective March 12 prices for railroad specialties, including couplers, yokes, bolsters and side frames for cars, would be advanced 4 per cent. Other prices recently announced include $3 a ton on splice bars, $4 on tie plates, and $8 a ton on cut track spikes.

Structural Shapes . . .

Structural Shape Prices, Page 173

Chicago — Heavy backlogs of orders in structural fabricating shops and delay in delivery of plain shapes apparently are cutting a wide swath through future plans for building construction. On top of this, the government's announcement that construction is to be restricted in favor of G. I. housing is causing consternation and uncertainty. Within the past few days, awards for fabrication have been few and inquiry is negligible.

Boston — Inquiry for fabricated steel has slackened but plain material has tightened, with deliveries further extended into fourth quarter. Program for production of prefabricated stetel frame houses for a nation-wide mail order house by a Rhode Island fabricator is being held up by uncertainty of obtaining small structural shapes. Estimates are also slackening while public works and commercial building plans are being delayed in larger volume. One industrial project in New Britain, Conn., is being held up by shortage of fabricated steel.

Philadelphia — While some structural shops are still down, due either to strikes or inability to obtain sufficient steel to operate, fabricated production is generally improved. Shops continue to refuse to quote on much of the work being offered.

Seattle—Plans are completed for the Narrows Bridge near Tacoma, Wash., and bids may be invited next month. Specifications call for 17,000 tons of shapes and 6000 tons of cable wire, twice the tonnage in the former structure. Increased cost of steel is expected to raise the cost about $115,000. U. S. Engineers are planning a control shaft, penstocks and substation at Fort Peck, Mont., requiring 240 tons of shapes and a tonnage of plates for tanks, penstocks and pipe.

Pig Iron . . .

Pig Iron Prices, Page 175

Pig iron shortage is expected to continue for some time, demand being heavy as foundries work against a heavy backlog and find labor situation easier. Lack of cast scrap puts a heavier burden on pig iron. Second quarter quotas are being formed and consumers are being held to a minimum to spread the supply as well as possible.

New York — Pig iron shipments are expanding slowly, but so heavy is the demand that all indications point to continued shortage for some time. District foundries are getting back to a better level of operation, now that some labor disputes have been settled and overall labor supply is somewhat greater. However, most foundries have far more business on books than they can handle and with expanding labor supply can take just about as much iron as can be offered, without exceeding the 30-day inventory limitations imposed by the government. Also contributing to the pressure for iron is the extreme shortage of cast scrap. Demolition work is still negligible and, all in all, cast grades are coming out in just about as limited quantities as at any time, even during the war.

St. Louis — Pig iron continues tight. The principal local producer switched from basic to malleable last week. One of its two furnaces is off because of ore and coke scarcity. Mill stocks are low, one being nearly out. Some iron has been drawn from Chicago and Birmingham, but these points are said not to be accepting orders now.

Cincinnati — Orders are being taken for second quarter pig iron needs. Melters are being held closely to former tonnages in reflection of the tight supply. Meanwhile foundries ask for increased allotments as they find more labor and demand for castings even more pressing. The district melt continues somewhat below that of fourth quarter because of strikes.

Boston — Pig iron sellers are lining up second quarter schedules but holding consumers to minimum volume. Melters in numerous instances are low on iron and dependent on current shipments in small lots to maintain production. While some conjecture as to possible increase in prices is evident, this has slight effect on buying, which in many cases is of emergency nature. For most part consumers will get January and March iron but February tonnage has been lost, with indications the supply will be tight for some months, desperately so if further interruptions develop from a coal strike.

Pittsburgh — Steel foundries state the 4 per cent advance in steel castings price, effective March 12, compensates only for previous additions to operating costs and fails to offset any of the USA-CIO demand for 18½ cents per hour in-

crease demanded. At a recent OPA steel castings industry advisory committee meeting industry members estimated prices should be advanced 14 per cent to meet rising costs. However, OPA held that a 4 per cent increase would sustain profits at the 1936-39 base period average. Price action is expected soon on malleable iron castings. Somewhat higher increases may be in line for this industry, to stimulate production, which is substantially below requirements, with the result that some important reconversion programs are behind schedule.

The expected pig iron price advance has not been made officially. Pig iron supply is expected to fall well below requirements for the remainder of the year for such important reconversion industries as housing, farm machinery, automotive, railroad and consumer goods. Increased pressure for pig iron from the automotive industry should develop, now that the General Motors strike is settled and with easing steel supply permitting increased production schedules at other automotive plants. Pig iron production in this area now is above prestrike level but sellers are expected to continue rationing through the year. Blast furnace operations would be almost immediately affected if a coal strike is called, as stocks are low.

Chicago — Prospects are that for months to come pig iron demand will outrun supply, with result that some form of allocation must be continued and foundries must operate with minimum inventories. Loss of iron production during the steel strike aggravated the situation, but contributing also is the fact that foundries are gaining manpower and therefore expanding operations to satisfy the tremendous backlog and demand for castings. Iron production in this district has returned to prestrike level, with little additional gain possible. Settlement of the General Motors strike means that the company's foundries will open in a few days. Iron demand will undergo another boost when the farm implement industry settles its strike. However, steady foundry operations ahead are jeopardized by the threatened coal strike, for coke is equally as critical as iron, and a mine shutdown would be felt almost immediately.

Birmingham—Pig iron continues tight, even with blast furnaces practically in full operation again. A shortage of cast scrap is reported in some circles. Currently, demand for pig iron is greater that the merchant industry's capacity. One merchant iron producer is paying special attention, however, to smaller users.

Philadelphia — A large district blast furnace was blown in March 13 after undergoing minor repairs, having been down since beginning of the steel strike. Its capacity is badly needed by district consumers, who are finding supply far short of requirements. Pig iron sellers are restricting quotas rather sharply in an effort to spread supply equitably. Aggravating the situation is continued shortage of cast scrap. Meanwhile requests for second quarter tonnage swamp sellers.

Scrap . . .

Scrap Prices, Page 176

No easing in scrap supply has appeared. Numerous industrial plants usually large producers are not receiving sufficient steel to allow full operations and some are still strikebound. Railroads are not offering as much as usual. Observers believe the shortage will be intensified as steel mills get back to normal production as supply probably will not increase greatly. Melters are taking all material offered and are paying springboards to bring in material from a distance.

Pittsburgh — Although all steel mills here are taking scrap deliveries, the total movement is estimated to be only 20 to 30 per cent of prestrike volume. Few additional metal fabricating plants have reopened recently, and some of the largest scrap producers are still idle. Until finished steel output attains prestrike momentum, there is little prospect of those metalworking companies now operating materially increasing production. Influx of miscellaneous unprepared scrap from outside sources is discouragingly small. Crushing operations are down to about two to three days a week as turnings continue difficult to bring in, even on relatively high springboards, ranging from $1.50 to $2 a ton. Higher springboards also are offered on heavy melting steel to no avail. Indicative of the extreme tightness in scrap supply is report that alloy turnings, for some time uninteresting at sharply reduced prices, are now being taken at within 75 cents a ton of the $15 ceiling. Railroads continue to run behind on shipping schedules against previous offerings. The last two lists of the Pennsylvania Railroad have not included any rails, perhaps indicating that the railroad is attempting to get caught up on previous commitments. Effort of yard dealers to increase the preparation margin to $5 from $3.50 a ton is another factor that may eventually force upward revision in scrap price ceilings.

New York — Demand for scrap, especially cast grades, continues to exceed demand. There are some slight indications of an easing in melting steel grades, but even so there is more demand than actual supply. Spring usually brings out more scrap and undoubtedly that will be the case this year. However, some trade interests point out that the increase should not be as marked as usual as weather has been fairly open this winter, thus permitting easier collection and preparation than usual. On the other hand, and while consumption has been substantially reduced this winter because of strikes, especially the nationwide steel strike, manufactured scrap, which represents most of normal supply, has been likewise restricted, with production still limited at various plants because of labor disturbances or shortage of materials.

St. Louis — Scrap supply continues tight, although shipments are fair. Premium grades are as scarce as at any time during the war and are expected to become more so as mills increase normal steelmaking rate, a severe strain being predicted when 85 per cent operations are reached. Mills have fair reserves but are taking in all they can get. End of the steel strike has reinstated old

orders but little new buying has been done.

Boston — Limited offerings of steelmaking grades and cast scrap are readily absorbed against old orders and new buying. Supply of unprepared scrap is light. Prices are at ceilings. Volume of railroad and industrial scrap is limited and while some low phos material comes out in moderate lots, demand for that grade is strong. Supply of bundles also is light.

Cincinnati—Supply of iron and steel scrap is far short of demand, buyers' inquiries being most numerous in cast and short rails. Volume is off, in large part because of diminished tonnage of industrial scrap. All district melters are actively buying whenever material is offered, but many have fair reserves. Another outlet for scrap was opened with start of production by Andrews Steel Co. which has some scrap inventory but is again buying.

Chicago — Because little production scrap is available currently, mills are unable to purchase as freely as they like. Prospects are, therefore, that the material stored at docks and outside points during the steel strike may have to be brought in faster than planned. It had been hoped that this accumulation could be drawn upon slowly and thus serve as a reserve. But consumers of finished steel are just now feeling full effect of the steel strike, and, with inventories exhausted, are reducing or suspending operations until new stocks can be accumulated. It will be another month before manufacturers' scrap begins to move freely. In the meantime, scrap prices hold at ceiling and demand holds steady at a high level.

Philadelphia — While some trade interests regard the situation in melting steel as a shade easier unprepared scrap is leaving here for the Pittsburgh district at ceiling prices and sellers generally report no difficulty in disposing of all prepared scrap they can find. However, with weather conditions more favorable and manufactured scrap coming out somewhat more freely, now that labor disruptions are less numerous, it is not surprising that some talk of easing is heard.

Washington — Available scrap is estimated to be running 100,000 to 200,000 tons below the indicated 1,700,000 monthly requirements, by T. J. Lyons, chief of Civilian Production Administration scrap branch. Shortage is causing heavy drain on pig iron supplies. The stockpile has been declining steadily since end of the steel strike. An additional 2,000,000 tons is needed to bring supplies back into line. Battlefield scrap available to this country amounts to less than one month's requirements for steel mills operating at capacity. Householders are being asked to help meet the deficit.

Warehouse . . .

Warehouse Prices, Page 174

Pittsburgh — Comparatively little of the limited mill production to date has gone to warehouses. Distributors state inventories are lowest on record, and unless some shipment preference is granted, stock position will become more critical. In some instances stocks of galvanized sheets, merchant wire products, wide flange beams, smaller bar sizes, and hot and cold-rolled sheets in lighter gages are depleted. Most interests believe inventories will not be restored to normal until early next year, for mills are expected to ration available output during this period to meet the immediate needs of regular customers.

Boston — Demand for steel from warehouse has declined, with replacements somewhat improved, although shipments to warehouses are uneven. Tonnage originally ordered for early first quarter replacement now is coming in. Pressure for fill-ins from jobbers for industrial buyers has subsided and indications are that distributors will be able to build a more balanced inventory during the next few months, although on faster moving items this will be difficult in view of tight mill schedules.

Philadelphia — Jobbers report an upward trend in bookings, although limited by restricted mill shipments and conservation measures still in effect at the request of Washington. Notwithstanding heavy demand most jobbers do not anticipate for some time anything to compare with last year's rate of business.

Chicago — With new supplies of steel being received slowly, warehouses find themselves still in a critical position. They are pressing mills for increased tonnage, but discover allocations apply in their case the same as to consumers.

Semifinished Steel . . .

Semifinished Prices, Page 172

Pittsburgh — Shortage of semifinished steel continues to retard finishing mill rolling schedules. However, immediate supply shows signs of improving slightly as steel production schedules gain momentum. Recent price advances are held inadequate by most steel producers, and consequently mills are attempting to convert as much semifinished steel as possible into products netting them the best return. Considerable pressure is developing to force integrated mills, either through a subsidy arrangement or some form of allocation, to meet a greater portion of demand originating from non-integrated mills and for export. Non-integrated interests claim they cannot obtain sufficient supply of wire rods, skelp, sheet bars and slabs. However, integrated mills state they are hard pressed meeting own requirements.

Unionization of Foremen Upheld by NLRB Decision

(*Concluded from Page 77*)

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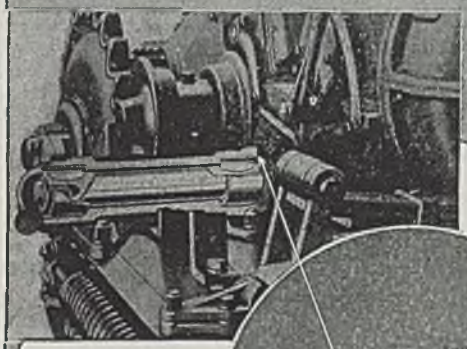

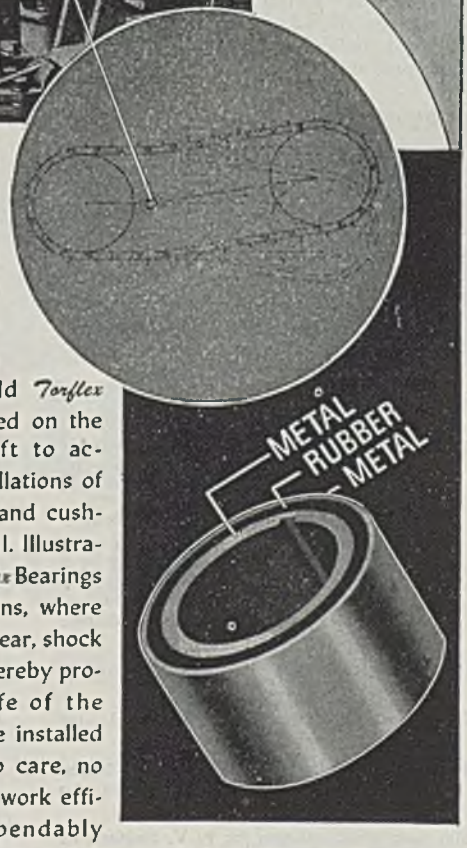

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ship on his bargaining representative, we have treated such acts and utterances as the acts and utterances of the employer, even though the record contained no evidence that the supervisor's conduct had been authorized by higher management."

Steel in Europe . . .

London — (*By Cable*) — Large contracts have been placed for steel for railroad car building, involving 40,000 tons. The labor position in foundries is difficult. Rail mills are filled for many months to meet rehabilitation needs of railroads. Sheet demand is active.

Joslyn Advances Stainless

Joslyn Mfg. & Supply Co., Chicago, producer of Joslyn steels, announces an increase of 8.2 per cent in price, effective immediately, on all its stainless steel products.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

7300 tons, engine manufacturing plant, Peoria, Ill., for Caterpillar Tractor Co., to American Bridge Co., Pittsburgh; bids March 5.

1250 tons, hotel and apartment building, Houston, Tex., to Mosher Steel Co., Houston, Tex. Stone & Webster, Boston, engineers.

760 tons, addition for Michael Flynn Mfg. Co., Philadelphia, to Belmont Iron Works, Philadelphia.

215 tons, coal trestle for Reading Co., Philadelphia, to American Bridge Co., Pittsburgh.

130 tons, Pennsylvania state bridge, Montgomery county, to Phoenix Bridge Co., Phoenixville, Pa., through John F. Keller, Perkiomenville, Pa.

STRUCTURAL STEEL PENDING

16,000 tons, also 6000 tons cable wire, for Narrows bridge, Washington state; plans prepared, bids soon to state toll bridge authority, Olympia, Wash.

1300 tons, store, Syracuse, N. Y., for W. T. Grant Co.

1200 tons, utility buildings, Gary, Ind., for Butler Mfg. Co.

415 tons, Pennsylvania state bridge in Northumberland county; new bids asked for April 2.

300 tons, plant addition for P. V. Engineering Forum Inc., Philadelphia, manufacturer of helicopters; bids March 18.

240 tons, control works and other facilities, Fort Peck, Mont.; bids soon to U. S. engineers.

Unstated, gates, hoists, etc., Anderson Ranch dam project, Boise, Idaho; bids to Denver, April 23; Spec. 1221.

REINFORCING BARS . . .

REINFORCED BARS PLACED

370 tons, warehouse, Minneapolis, for Northrup King & Co., to Paper-Calmenson & Co., St. Paul.

150 tons, expansion, Hopkins, Minn., for Red Owl Stores Inc., to Cowin & Co. Inc., Minneapolis; Standard Construction Co. Inc., Minneapolis, contractor.

REINFORCED BARS PENDING

1300 tons, flood walls, Kansas City, Mo., for United States Engineers.

750 tons, cheese factory, Plymouth, Wis., for Borden Co.

550 tons, Fall river dam, Greenwood county, Kans.

500 tons, dam, Wister, Okla., for United States Engineers.

500 tons, coke ovens, Weirton, W. Va., for Weirton Steel Co.; Koppers Co. Inc., Pittsburgh, contractor.

350 tons, expansion, La Crosse, Wis., for Sears, Roebuck & Co.

305 tons, expansion, Zion, Ill., for Zion Industries; bids March 11.

230 tons, addition, Chicago, for White Cap Co. Unstated, six, 1200-foot ship mooring piers at Puget Sound navy yard; bids to Navy soon.

200 tons, wasteway and other structures, Owyhee project; bids to Reclamation Bureau, Boise, Idaho, March 22.

85 tons, deformed reinforcing for Ampere station; bids to Bonneville Administration, Portland, Oreg., March 13.

PLATES . . .

PLATES PLACED

Unstated, steel water storage tank, Ritzville, Wash.; Hanson Construction Co., Spokane, Wash., general contractors.

Unstated, two oil storage tanks for Milwaukee Railroad, Seattle; to Puget Sound Sheet Metal Works, Seattle.

Unstated, six oil storage tanks for Bonneville Administration; Hydraulic Supply Mfg. Co., Seattle, apparently low.

PIPE . . .

CAST IRON PIPE PLACED

50 tons, 6-inch, improvement at Tacoma, Wash., to H. G. Purcell, Seattle.

CAST IRON PIPE PENDING

600 tons, Maplewood water district project, Portland, Oreg.; bids in.

550 tons, improvement at Yakima, Wash.; bids in.

330 tons, 18,500 feet, Bremerton, Wash.; Hugh G. Purcell, Seattle, low for U. S. Pipe & Foundry Co.

Sheet Distributors Told Steel Easing Unlikely Soon

(*Concluded from Page 83*)

formerly established on black plate other than can making quantity may now be increased by 8.2 per cent.

"Resellers of bale ties should note the following: Previously established maximum mill prices have been on a column basis, the increase now permitted mills by amendment is 32½ cents per 100 pounds. It would be wise for resellers in passing on this increase to figure 32½ cents per 100 pounds on the net weight of the mill delivered carload price as the permissible increase since it has not been customary for steel mills to split columns and until official interpretation is issued, use of a split column might not be proper.

"Most of you distributors here are vitally interested in galvanized roofing and siding, also painted roofing and siding. The Steel Mill Products Section is issuing an interpretation to the effect that galvanized roofing and siding is to be considered a galvanized sheet product and that painted roofing and siding is to be considered a hot-rolled sheet product, and that the increases granted mills on galvanized sheets and hot rolled sheets shall apply to the above mentioned products, respectively.

CONSTRUCTION AND ENTERPRISE

ARKANSAS

EL DORADO, ARK.—Lion Oil Co. plans erection of a 450-barrel capacity catalytic cracking unit for high-octane gasoline, fuel oil, etc., to cost about $750,000.

CALIFORNIA

LOS ANGELES—Square D Co., manufacturer of electrical devices, will build a steel frame factory building on Valley Blvd., to cost about $350,000. Austin Co. has contract.

LOS ANGELES—Aluminum Welded Fabrication Co. has been formed by Henry P. Gebo and George B. Gebo and has established operations at 1946 South Main St.

POMONA, CALIF.—Salsbury Motors Inc., subsidiary of Northrop Aircraft Inc., has let contract to C. T. & W. P. Stover, 116 North Alexander Ave., Claremont, Calif., for a factory and administration building of 65,000 square feet on a ten-acre site at Reservoir St. and Lexington Ave., to cost about $1 million. Kaufman, Lippincott & Eggers, 627 South Carondelet St., Los Angeles, are architects.

SUNNYVALE, CALIF. — Libby, McNeil & Libby, 60 California St., San Francisco, has let contract to E. W. Heple, 494 Delmar Ave., San Jose, Calif., for a cannery plant near Evelyn Ave., to cost about $300,000. Ellison & King, 500 Sansome St., San Francisco, are engineers.

VERNON, CALIF.—Victor Welding Equipment Co. is erecting a plant and warehouse building at 3821 Santa Fe Ave., to cost about $16,700.

CONNECTICUT

ROCKVILLE, CONN.—City plans sewage treatment plant improvements costing about $350,000. Metcalf & Eddy, 1300 Statler Bldg., Boston, are engineers.

ILLINOIS

BELLEVILLE, ILL.—E. W. Tiemann, mayor, City Hall, plans sewage disposal plant costing $400,000 and sewers costing about $800,000. J. C. Thompson, City Hall, is city engineer.

SPRINGFIELD, ILL.—City has plans by Burns & McDonnell Engineering Co., 107 West Linwood Blvd., Kansas City, Mo., for steam generating plant at Lakeside power plant, five miles south of city, to generate 250,000 pounds of steam per hour, estimated to cost about $600,000. Bids will be taken March 26.

INDIANA

NEW ALBANY, IND.—Gunnison Homes Inc., F. A. Gunnison, president, McBeth St., has let contract to F. W. Owens Construction Co., 118 North Fifth St., Louisville, Ky., for a one-story 350 x 550-foot manufacturing plant, to cost about $450,000.

PORTLAND, IND. — C. Wilson, secretary of

board of public works, has plans for a sewage treatment plant and sewers to cost about $200,000. Bevington, Taggart & Fowler Inc., Indiana Pythian Bldg., Indianapolis, are consulting engineers.

IOWA

ESSEX, IOWA—City is considering bids on a municipal light and power plant, including diesel engine generator and distribution system. Bonds for $80,000 have been voted. Buell & Winter, 508 Insurance Exchange Bldg., Sioux City, Iowa, consulting engineers, have prepared plans.

KANSAS

GREENLEAF, KANS.—City, O. L. McKelvey, clerk, has plans by Wilson & Co., Salina, Kans., for a sewage disposal plant and sewers, to cost about $175,000.

MARYSVILLE, KANS.—City plans erection of a sewage disposal plant to cost about $80,000.

MASSACHUSETTS

ARLINGTON, MASS. — Board of selectmen, Town Hall, are having preliminary plans drawn for a sewage disposal plant to cost about $200,000.

LYNN, MASS.—General Electric Co. will let contract soon for a plant addition at its West Lynn Works, to cost over $40,000.

MICHIGAN

BATTLE CREEK, MICH.—Fertigator Co., 243 Capital Ave., has been incorporated with $50,000 capital to manufacture a patented tool by Vernon R. MacFee, same address.

DETROIT—Michigan Chrome & Chemical Co., 6340 East Jefferson Ave., has let contract to Cunningham-Rudy Co., 3087 West Grand Blvd., for a plant addition to cost about $60,000.

DETROIT—Michigan Body Co., 2210 St. Aubin Ave., will let contract soon for a one-story plant addition to cost about $50,000.

DETROIT—Republic Appliances Inc., Dime Bldg., has been incorporated with $5000 capital to manufacture appliances and equipment, by Byron D. Kuth, 2021 NBC Bldg., Cleveland.

DETROIT—Marine Equipment Corp., 484 East Grand Blvd., has been incorporated with $25,000 capital to manufacture marine equipment, by John M. Bessemer, same address.

DETROIT—Krueger Co., 9956 East Forest Ave., has been incorporated with 500 shares no par value to manufacture tools, dies, jigs, parts and fixtures, by Herman A. Krueger, 3510 McClellan Ave.

DETROIT—Defiance Weatherstrip Co., 10339 Twelfth St., has been incorporated with $80,000 capital to do general manufacturing, by Glenn P. Haas, 528 Lakepointe Ave., Grosse Pointe Park, Mich.

DETROIT—Craine Diamond Tool Co., 8100 Lyndon Ave., has been incorporated with $50,000 capital to manufacture diamond tools, by Clyde P. Craine Jr., 20072 Picadilly Rd.

GRAND RAPIDS, MICH.—Atwood Iron Industries has let contract to Barnes Construction Co., 1310 Chicago Ave. NW., for a steel and concrete foundry building to cost about $200,000. Associated Engineers, 802 Old First Bldg., Fort Wayne, Ind., are engineers.

JACKSON, MICH.—F. & H. Bar Products Corp., 536 North Mechanic St., has been incorporated with $50,000 capital to manufacture screw machine products, by Fred W. Wendt, same address.

KINGSFORD, MICH.—Grede Foundries Inc., 1320 South First St., Milwaukee, and Lake Shore Engineering Co., Iron Mountain, Mich., have let contract to A. H. Proksch, Iron River, for a one-story 160 x 520-foot foundry. Grassold & Johnson, 734 North Jefferson St., Milwaukee, are architects.

MARTIN, MICH.—Martin Castings Co., has been incorporated with 280 shares no par value to manufacture castings, by Lon O. George, 1323 West North St., Kalamazoo, Mich.

MIDLAND, MICH.—Utilities Engineering Co. Inc., 375 Saginaw Rd., has been incorporated with $25,000 capital to manufacture heating equipment, by Howard A. Brinkerhoff, same address.

MILLINGTON, MICH.—Millington Truck Body Co., 8440 State St., has been incorporated with $110,000 capital to manufacture commercial truck bodies, by Donald H. MacLaren, Millington.

MUSKEGON, MICH.—City plans sewage treatment plant additions to cost about $550,000.

ST. CLAIR, MICH.—City has plans for a garbage and sewage disposal plant to cost about $90,000. R. Delano is city engineer.

MINNESOTA

MINNEAPOLIS—Flour City Ornamental Iron Co., 2637 27th Ave. South, has let contract to Madsen Construction Co., 1790 Lyndale Ave. South, for a one-story 300 x 339-foot plant. Magney, Tusler & Setter, 202 Foshay Tower, are architects.

ST. CLOUD, MINN.—A. J. Haberkorn, city clerk, has plans for a sewage disposal plant to cost about $100,000. Buell & Winter, Insurance Exchange Bldg., Sioux City, Iowa, are consulting engineers.

ST. PAUL, MINN. — United States Steel Supply Co., 2545 University Ave., has let contract to J. S. Sweitzer & Son, 615 Minnesota Mutual Life Bldg., for a 300 x 300-foot warehouse building, to cost about $600,000.

MISSISSIPPI

NATCHEZ, MISS. — Johns-Manville Corp., Lewis H. Brown, president, 22 East 40th St., New York, plans erection of insulating board factory near Natchez, at cost of about $5 million. Building to be monitor-type with about 300,000 square feet floor space.

NEVADA

SPARKS, NEV.—Steel Conversion Corp., Petroleum Bldg., Los Angeles, James P. Walsh, manager, is building a plant here for manufacture of demolition tools for mines, mills, foundries and tools for railroad track maintenance. David J. Catrow will be in charge of the local plant.

NEW JERSEY

SECAUCUS, N. J.—Town plans erection of a sewage disposal plant to cost over $400,000. F. J. Radigan, Peoples National Bank Bldg., Secaucus, is consulting engineer.

NEW YORK

BROOKLYN, N. Y.—Eastern Can Co., 649 Kent Ave., has let contract to Caye Construction Co., Inc., 356 Fulton St., for a two-story 145 x 153-foot plant, estimated to cost about $125,000.

OHIO

AVON LAKE, O.—B. F. Goodrich Chemical Co., Rose Bldg., Cleveland, W. S. Richardson, general manager, announces that eventually the pilot plant under construction at Walker and Moore Rds., will be developed into a large production plant. Site of 100 acres additional has been bought for this purpose.

CLEVELAND—Angell Nail & Chaplet Co., 4580 East 71st St., is considering an addition to increase manufacturing space. Charles F. Homsier is in charge.

CLEVELAND—Reliance Electric & Engineering Co., J. W. Corey, president, 1088 Ivanhoe Rd., will build a plant at Ashtabula, O., to cost about $1,500,000, equally divided between building and equipment. Plant will manufacture 15-hp motors and drives. Plant will be one story, with 120,000 square feet floor space.

CLEVELAND—Jorden Welding & Mfg. Co., 9428 Cassius Ave., will build a branch plant at Lorain, O., a T-shaped building 50 x 105 feet with two wings each 50 x 75 feet. Product will be power lawn mowers.

CLEVELAND—Lamson & Sessions Co., 1971 West 85th St., will build an $85,000 plant building for wire drawing operations, equipped with sprinkler, overhead crane and runway. George W. Hinds is purchasing agent.

COSHOCTON, O.—General Electric Co., plastics division, William H. Milton Jr., Pittsfield, Mass., in charge, is having plans prepared for a $5 million plastics plant here.

GALLIPOLIS, O.—City has plans for a sewage disposal plant to cost about $750,000. Burgess & Niple, 568 East Broad St., Columbus, O., are engineers.

GENEVA, O.—Village has plans by R. N. Case, Geneva, for an incinerator estimated to cost about $100,000.

YOUNGSTOWN—Youngstown Sheet & Tube Co. directors have authorized expenditure of $3,640,000 for improvements when materials can be obtained. Included in plans are rebuilding of two ore bridges at Campbell Works, facilities for drawing finer wire at Struthers mill and expansion of cold-reducing mill. A two-stand temper mill is planned for Indian Harbor, Pa.

OKLAHOMA

DURANT, OKLA.—A. Frost, city clerk, has plans for a sewage disposal plant to cost $200,000 and various sewers. W. B. McMasters, 3215 Military Ave., Oklahoma City, is engineer.

OKLAHOMA CITY, OKLA.—R. Lee Jr., city clerk, City Hall, has plans for a garbage incinerator to cost about $250,000.

PENNSYLVANIA

MT. UNION, PA.—City is having plans prepared for a sewage treatment plant to cost over $150,000.

RHODE ISLAND

BRISTOL, R. I.—Town board of selectmen is having plans prepared for a refuse incinerator estimated to cost about $60,000.

TEXAS

CORPUS CHRISTI, TEX.—La Gloria Corp., Robert T. Wilson, president, plans $14 million synthetic gasoline plant in Brownsville, Tex., area, to produce gasoline from natural gas.

CORPUS CHRISTI, TEX.—Humble Oil & Refining Co. and associated companies, 1216 Main St., Houston, Tex., plans a natural gas processing plant to cost $500,000.

DALLAS, TEX.—Verson Allsteel Press Co., D. Verson, president, 1355 East 93rd St., Chicago, plans a one-story manufacturing plant here, to cost about $500,000. G. B. Cleb & Associates, Texas Bank Bldg., are architects.

DICKENSON, TEX.—Humble Oil & Refining Co. and associated companies, 1216 Main St., Houston, Tex., plans a natural gas processing plant near here, to cost about $750,000.

VICTORIA, TEX.—Tennessee Gas & Transmission Co., Commerce Bldg., Houston, Tex., has plans in preparation for an 8000-hp compressor station to cost about $800,000.

WISCONSIN

RACINE, WIS.—Racine Iron & Wire Works, 901 Prospect St., is having plans drawn by F. J. Hoffman, W. C. Schneider Associates, 201 Sixth St., for a one and two-story plant addition 78 x 101 feet.

EQUIPMENT . . . MATERIALS

FOR SALE

ALLOY STEEL

ROUND, HEX, SQUARE BARS

New York and Pittsburgh Warehouse Stocks

L. B. FOSTER CO.

3 Park Place, New York 7
Phone—Barclay 7-2111
P. O. Box 1647, Pittsburgh 30
Phone—Walnut 3300
Michigan Distributor
C. J. GLASGOW COMPANY
2089 Fenkell Ave., Detroit 3
Phone—Townsend 8-1172

FOR SALE

39—Fully Repaired Box Cars
12—8,000 gallon Tank Cars
7—10,000 gallon Tank Cars
1—Ohio 25-ton Locomotive Crane

New and Used
RAIL & INDUSTRIAL EQUIPMENT CO.
30 Church St., New York 7, N. Y.
Telephone BArclay 7-9840

FOR SALE

60,000 lbs. of 1-3/16" dia. W.D. 1115 COLD FINISHED STEEL BAR.

COLUMBUS PRODUCTION MFG. CO.
249 E. Fifth Ave. Columbus 1, O.

WANTED

TORRINGTON NO. 457 (OR EQUIVALENT) NINE ROLL FLATTENING MACHINE 2-1/2" Dia. x 4" Face Rolls for flattening brass strips .020" to .125" thick x 1" wide.

Write, Wire or Phone

LUDLOW TYPOGRAPH COMPANY
2032 Clybourn Ave., Chicago 14, Ill.
Tel. Lincoln 5151

IRON & STEEL PRODUCTS, INC.
Steel Buyers • Sellers • Traders
Plates—Sheets—Bars
Structurals—Rails—Wire Billets
"ANYTHING containing IRON or STEEL"
41 years' experience
13462 S. Brainard Ave. • Chicago 33, Illinois

HAMMERS, 3-B & 4-B Nazel M.D.
LATHE, Turret 24" Gisholt, 6-1/4" hole.
PRESS, Forging 1000 ton United Steam-Hyd.
PLANER, O. S. 60" x 60" x 14'. D&H M.D.
SHAPER, 36" Morton Draw Cut.
SHEARS, Alligator 1"—4".
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.

OVERHEAD CRANES

200-Ton Alliance 100' Span
150-ton Whiting 30' Span
89-Ton "American" 40'6" Span
75-Ton Alliance 37' Span
75-Ton Alliance 78' Span
50-Ton Shaw 69'10" Span
40-Ton Alliance 82' Span
35-Ton Northern 22' Span
30-Ton Case 41' Span
30-Ton Morgan 77' Span
30-Ton Morgan 30' Span
30-Ton Niles 53'9" Span
30-Ton Reading 56' Span
25-Ton Bedford 50' Span
25-Ton Cleveland 106' Span
25-Ton P&H 70' Span
25-Ton Whiting 106' Span
25-Ton Whiting 82' Span
20-Ton Alliance 77' Span
20-Ton Cleveland 65' Span
20-Ton Morgan 77' Span
20-Ton Northern 60' Span
20-Ton P&H 51'4" Span
20-Ton P&H 39'6" Span
20-Ton Shaw 76'4" Span
20-Ton Shepard Niles 49'6" Span
15-Ton Alliance 50' Span
15-Ton Alliance 35' Span
15-Ton Cleveland 55'6" Span
15-Ton Cleveland 35' Span
15-Ton Morgan 77' Span
15-Ton Niles 32' Span
15-Ton Northern 53' Span
15-Ton Shaw 82' Span
15-Ton Shaw 77' Span
15-Ton Toledo 82' Span
15-Ton Whiting 74'8½" Span
12-Ton Morgan 56' Span
10-Ton Alliance 58'9" Span
10-Ton "American" 27' Span
10-Ton Case 31'9" Span
10-Ton Cleveland 38' Span
10-Ton Cleveland 50' Span
10-Ton Lane 50' Span
10-Ton Morgan 39'5" Span
10-Ton Morgan 77' Span
10-Ton P&H 57' Span
10-Ton Northern 34' Span
10-Ton P&H 37'4" Span
10-Ton P&H 48'10½" Span
10-Ton P&H 60' Span
10-Ton P&H 80' Span
10-Ton P&H 87'6" Span
10-Ton Toledo 38' Span
10-Ton Manually Operated
7½-Ton Erie 70' Span
7½-Ton P&H 30'6" Span
7½-Ton Shepard 36' Span
6-7-Ton Milwaukee 70' Span
6-Ton Shaw 23' Span
5-Ton "American" 10' Span
5-Ton Champion 37'6" Span
5-Ton Euclid
5-Ton Milwaukee 39'8" Span
5-Ton Milwaukee 66'9" Span
5-Ton Milwaukee 70' Span
5-Ton Northern 49'6" Span
5-Ton P&H 45' Span
5-Ton Shaw-Box 25' Span
5-Ton Shepard 40' Span
5-Ton Toledo 96' Span
5-Ton Whiting 80' Span
3-Ton P&H 46'4" Span
3-Ton Shaw 33' Span
3-Ton Whiting 57'3" Span
2-Ton Detroit 28' Span
2-Ton Louden 19'2" Span
2-Ton P&H 46'4" Span
2-Ton Shep. Niles 18' Span
2-Ton Shep. Niles 14' Span
1½-Ton Cleveland 25' Span
1½-Ton P&H 22'8" Span 34' Span
1-Ton Curtis 24' Span
½-Ton "American" 17' Span

Take advantage of the ECONOMY service by telephoning to us *collect,* which will enable us to discuss your requirements and present our suggestions.

In addition to overhead cranes we can supply all types of shovels, cranes, draglines, tractors, or practically everything in the equipment field. May we have your inquiries?

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49 Vanderbilt Avenue, New York 17, N. Y.

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SURPLUS EQUIPMENT FOR SALE

1—No. 4343 HC 18 Reeves Motor drive output Speed 18.4—3.07 RPM motor, 1½ HP 208-3-60 General Electric shaft standard shifting equipment, hand wheel assembly No. 28 belt No. M4410.
8—78 American Gas Cylindrical Vertical Gas Annealing Furnaces without retort or cover lifting device.
1—Mathews Marking Machine for marking periphery on 2¼ dia. slugs 7" long.
29—6" WSL Small Piece Lathes complete with air operated TS front profile slide, 5 HP motor and starter, profile former, graduated hand wheel work drive.
1—No. 3 Cinn. Double Centerless Grinder, Serial 1933.
1—No. 213 Campbell Wet Abrasive Cutting Machine complete with 7½ HP 3600 RPM ball bearing motor, 220 V, 3 HP 60 cycle and switches.
1—Fairbanks Model "D" Power Hammer.
1—Bradley 100 lb. Upright Strap Hammer.
1—No. 8 Bullet Buffalo Shear with knives complete with motor tilting gauge and switches.
1—Mahr 3' 6" x 2' 3" x 3" oil fired open front slot type forging furnace complete with temperature controlled equipment.
3—No. 1 West Hydraulic Tire Setter Presses complete with motor and starter 3 HP 60 cycle 220 V.
4—No. 32R Motorized Rockwell Tester.

WRITE FOR PRICES ON THE ABOVE EQUIPMENT

ANDOVER KENT AVIATION CORPORATION
MIDDLETOWN, CONN.

EQUIPMENT . . . MATERIALS

WANTED
Any part of 50,000 each size:
20 GAUGE C.R. STEEL DISCS
3 1/8" - 6 3/16" and 8 5/32"
We have dies.
SENECA MANUFACTURING CO.
450 North Seneca St., Wichita 12, Kans.

WANTED
SPRING STEEL
1/4" x 1" (Round or Square Edge) SAE-1095 or similar. 15 tons or any smaller quantity.
THE BLACK BROS. CO., INC.
Mendota, Illinois

ROLLING MILLS and EQUIPMENT
FRANK B. FOSTER
829 OLIVER BLDG. PITTSBURGH, PA.
Cable Address "FOSTER" Pittsburgh

CLASSIFIED

Opportunities

Opportunities

FOR SALE—LEASE—OR TRADE
(Stock Exchange)

A Medium Sized Forge Plant, located in a good town in Pittsburgh Area. Good building and equipment now being run by the best operator in the industry. Plant has excellent labor situation and has always been a money-maker.

To responsible concerns able to use such a plant, a very advantageous deal can be worked out at a figure less than sound value of buildings and equipment. Write for particulars.

HETZ CONSTRUCTION CO.
2550 WEST MARKET STREET • WARREN, OHIO

Help Wanted

SALES MANAGER

Wanted by Machine Tool concern with headquarters in New York, specializing in and holding exclusive sales rights for world-known high precision machines and instruments. Must have initiative, be efficient and an excellent organizer, capable of handling sales staff and local distributors in important industrial centers of U.S.A. Knowledge of machine tools, also of some French and German preferred, but not essential, provided other qualifications of first rate sales manager exist. Age between 35 and 45. Please apply with detailed description of school education, business experience, family background, references and recent photograph.

Address Box 477,
STEEL, Penton Bldg., Cleveland 13, O.

WANTED
Young college graduate with some Blast Furnace experience. Excellent chance to train for good position. Pittsburgh district. Replies confidential. Address Box 474, STEEL, Penton Bldg., Cleveland 13, O.

Help Wanted

WAREHOUSE SUPERINTENDENT

For old established tubular steel company, vicinity Long Island City. Complete knowledge and experience this line absolutely essential. Give complete resume in application including salary desired.

Box S 7645
113 W. 42nd St. New York 18, N. Y.

WANTED IMMEDIATELY
SALES MANAGER

High grade only, by large structural steel fabricating company. State engineering education, experience, personality, age, references first letter.

Address Box 475
STEEL, Penton Bldg., Cleveland 13, O.

Opportunities

WANTED TO BUY A MANUFACTURING plant now producing a salable item or items that have customer acceptance. Must have sales distribution channels and raw material sources well developed. Must have an assured following of executive, clerical and production personnel. Prefer small town or city. Address Box 466, STEEL, Penton Bldg., Cleveland 13, O.

Bids Wanted

THE BOARD OF ADMINISTRATION, STATE of North Dakota, will receive sealed bids for furnishing and installing one 250 ton Hydraulic Press for the State Penitentiary, located approximately two miles east of Bismarck, N. D., until 10:00 A.M., April 1, 1946 at the office of the Board of Administration, Capitol Building, Bismarck, North Dakota, at which time all bids will be opened and read aloud. Specifications of the type hydraulic press wanted are on file in the office of the Board of Administration and the office of the Warden of the State Penitentiary, Bismarck, North Dakota, and copies may be had upon application to either the Board of Administration or the Warden, Bismarck, North Dakota. Each bid must be accompanied by a certified check on a solvent bank in North Dakota, in an amount not less than 5% of the amount bid, payable to the Board of Administration, State of North Dakota and a bidder's bond running to the Board of Administration, State of North Dakota, in a sum equal to the full amount of the bid. The Board of Administration, State of North Dakota, reserves the right to hold all bids for a period of five (5) days after the day fixed for the opening thereof, and to reject any and all bids and to waive any irregularities. By order of the Board of Administration, State of North Dakota. Dated at Bismarck, N. D., this 5th day of March, 1946. (Signed) R. M. Risnworth, Executive Secretary.

Help Wanted

Wanted
DESIGNERS AND DRAFTSMEN

Familiar with design of rolling mills and auxiliary equipment for steel mills. Good opportunities. All replies confidential.

REYNOLDS METALS COMPANY
Reynolds Metals Bldg., 3rd & Grace Sts.
Richmond, Va.

STEEL BUYER

Nationally known company located in town of 5,000 in middlewest seeks man familiar with all phases of steel buying, able to set up and oversee perpetual records. Opportunity for qualified man to take over eventually all purchasing.

Address Box 449,
STEEL, Penton Bldg., Cleveland 13, O.

PLANT SUPERINTENDENT WANTED. MUST have proven production record with experience in manufacturing wire goods and products made from strip steel. Opportunity to advance with growing concern. Write outlining experience, qualifications, salary and references. Plant located in Southwest. Address Box 471, STEEL, Penton Bldg., Cleveland 13, O.

CLASSIFIED

Positions Wanted

PURCHASING EXECUTIVE, AGE 43, WITH proven ability and best references desires position as Director of Purchases or Purchasing Agent for reputable company, preferably in Buffalo-Rochester area. Applicant has had extensive purchasing experience in elevator manufacturing. Address Box 457, STEEL, Penton Bldg., Cleveland 13, O.

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